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Educating the Interprofessional Team and Family About Sensory Challenges Children with Autism Spectrum Disorder May Experience

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Educating the Interprofessional Team and Family About Sensory Challenges Children with Autism Spectrum Disorder May Experience

by

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APPROVAL PAGE

This scholarly project, submitted by Delanie Vitosh, OTDS in partial fulfillment of the requirement for the Degree of Occupational Therapy Doctorate from the University of North Dakota, has been read by the Faculty Advisor under whom the work has been done and is hereby approved.

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4/14/22

Date

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Title: Educating the Interprofessional Team and Family About Sensory Challenges Children with Autism Spectrum Disorder May Experience

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ABSTRACT

Introduction: Children with autism spectrum disorder (ASD) often demonstrate difficulties processing and interpreting sensory input experiencing over-responsiveness or under-responsiveness to sensory stimulation (Autism Speaks, n.d.). A sensory education program was created to educate the interprofessional team and families about sensory challenges children with ASD experience and what strategies can be used to prevent or decrease the number of outbursts caused by over-stimulation, under-stimulation, and their potential impact on participation in meaningful occupations. Based on the literature review, non-compliance with home programs is a major factor negatively affecting therapeutic outcomes (Rone-Adams, Stern, & Walker, 2004). However, Koegel, Bryan, Su, Vaidya, and Camarata (2020) found that outcomes are much greater when caregivers implement interventions throughout the child's day. Therefore, collaboration with caregivers will be beneficial to help promote compliance of carrying over skills through the sensory education program.

Methodology: An extensive literature review was conducted to acquire information to create evidence-based strategies for the interprofessional team and families to use. The author utilized research articles, textbooks, and resources available from reliable databases including CINAHL complete, Google Scholar, and American Occupational Therapy Association (AOTA). The Ecology of Human Performance (EHP) model was used to guide the development of the education program with emphasis on the intervention approaches to develop sensory strategies that will meet the child's specific needs (Dunn, 2017).

Results: The child's vestibular, proprioceptive, visual, auditory, gustatory, olfactory, and tactile sensations can be highly impacted as the child may experience difficulties processing sensory input (Watling & Hauer, 2015). The sensory education home program provides sensory intervention strategies for caregivers to address children's sensory needs outside of the occupational therapy environment. The program provides a variety of strategies addressing all sensory systems as every child's needs differ.

Conclusion: It is anticipated that the sensory education program will help to educate the parents and the interprofessional team on a variety of sensory approaches that could be used outside of the occupational therapy environment to facilitate participation in daily routines and occupations.

Chapter I: Introduction

On average, about one in 44 children are diagnosed with autism spectrum disorder (ASD), with ASD being four times more common among boys than girls (Centers for Disease Control and Prevention [CDC], 2021). ASD is a developmental disability that may affect the way children with ASD communicate, interact, behave, and learn (CDC, 2021). Many children with ASD experience hyper-sensitivities or hypo-sensitivities to sensory stimulation because they are unable to process or integrate the stimuli. The hyper-sensitivities and hypo-sensitivities may be related to sounds, moving objects, auditory, visual, and tactile sensory input. Poor integration of sensation can impact occupational performance and result in difficulties to receive, organize, and use sensory information for self-regulation and motor planning (Mori, Champagne, & May-Benson, 2017). Mori (2015) stated that deficits in sensory integration may impact many occupations including activities of daily living, play, work, education, and social participation.

An interest in working with children across the autism spectrum led to partnering with an autism therapy center. The autism therapy center is an applied behavioral analysis (ABA) focused center that offers outpatient pediatric occupational therapy to individuals who receive ABA services through the facility's organization. The facility employs board certified behavior analysts (BCBAs) as well as registered behavior technicians (RBTs) to implement ABA therapy. After completing a needs assessment, it was found that the autism therapy center would benefit from a sensory education program. The sensory education program was created to inform the interprofessional team at the facility and families receiving services of the sensory challenges children with ASD may experience, why they may experience reactions to sensory stimuli, and what families can do to better manage behaviors related to sensory.

The purpose of this scholarly project was to address the gaps in literature related to educating caregivers of individuals with ASD about sensory challenges and how these challenges can be addressed to promote optimal occupational performance. Not only is parent education vital, parent collaboration with the interprofessional team is important to adapt treatment to support the child's needs. Additionally, parent education will help with child outcomes and increase their functional performance. The project also addresses the gaps in parent education at the autism therapy center related to home programming and the carryover of skills. Home programming is important to carry over from therapeutic environments to the child's natural environment to continue improving skills and promote positive outcomes. It is also important for the interprofessional team at the autism therapy center to carry over skills from occupational therapy to the child's ABA therapy environment as many children spend most of their days at the ABA facility. Based on findings from the literature review, it was found that non-compliance with home programs negatively impacts the child's outcomes, therefore, it would be beneficial to educate the interprofessional team and families on the importance of implementing sensory strategies that can be used outside of occupational therapy sessions in order for the child to be able to fully engage and participate in their meaningful occupations. The program also provides strategies the interprofessional team and families can use to prevent or decrease the number of outbursts caused by over-stimulation, under-stimulation, and their potential impact on meaningful occupations. Aside from parent education, it is important for the parents to collaborate with the interprofessional team to assure that all the child's specific sensory needs are being met.

Occupational therapy plays an important role in identifying and treating sensory integration problems in children with ASD. Occupational therapists are well equipped to provide

tools, resources, and support to individuals across the lifespan in order for them to participate in activities that are meaningful and necessary to live a successful and fulfilling life. Occupational therapists have an in-depth understanding of how engagement in meaningful occupations impacts health and well-being as they focus on client-centered facilitation of valued occupations. Thus, an occupational therapist is trained to address the needs of individuals with ASD who would benefit from further services that address sensory challenges. Occupational therapists analyze the person, context, and daily tasks a person participates in to create and implement appropriate interventions for occupational engagement to increase performance range. Occupational therapists focus on developing skills for individuals with ASD to promote engagement in meaningful activities. One of the main goals of an occupational therapist is to reduce the barriers one may face when participating or engaging in meaningful daily activities or occupations. Thus, an occupational therapist may guide interventions to meet each child's specific sensory needs.

The Ecological of Human Performance (EHP) framework was used to guide the creation of this product (Dunn, 2017). EHP is an occupation-based model that consists of the person, task, context, and performance range, focusing on how each component interacts with the others (Dunn, 2017). Within this framework, a person is embedded within their context, and their person factors influence the tasks they engage and participate in. This interaction between each construct defines a person's performance range (Dunn, 2017). The role of the occupational therapist includes looking at an individual's functional independence through intervention approaches including create, establish/restore, adapt/modify, alter, and prevent (Dunn, 2017). The program will utilize these interventions approaches explaining ways to adapt/modify a skill or the environment, alter the environment, create ways to accomplish a task, establish/restore

skills, and prevent barriers to completing tasks. By utilizing the sensory intervention strategies, individuals with ASD will be given an opportunity to engage in their meaningful daily activities and routines in their natural environment.

Upon completion of the product, the facility will have the resources to educate their interprofessional team and families who care for children with ASD. The overarching goal of this product will be that the interprofessional team and caregivers will have improved knowledge to care for a child with ASD who experiences adverse responses to sensory stimulation. After receiving the product, the interprofessional team and families will be educated on sensory challenges and will be able to utilize the strategies provided in the sensory education program. The sensory education program will consist of supplemental handouts to assist caregivers in addressing sensory challenges to increase the child's performance range related to meaningful activities.

The following chapters included discuss the review of literature, methodology, product, and summary. Chapter two reviews and examines the literature that was pertinent to guide the development of the sensory education program. The literature review provides an overview of ASD, sensory challenges children with ASD may experience, interventions that have been found to be effective when addressing sensory challenges, and the importance of educating caregivers. Chapter three includes the methodology and process used to create the product. Chapter four contains the complete product that can be used to implement the program. Finally, chapter five consists of a summary and overview of the scholarly project including the limitations of the product, implications for occupational therapy, and future recommendations for project sustainability.

Key terms utilized throughout the chapters and within the project are presented below:

- Autism Spectrum Disorder (ASD): a disorder characterized by difficulties in communication, social interaction, and repetitive behaviors (Nik Adib et al., 2019).
- Sensory integration: “perceiving, modulating, organizing, and interpreting sensations to optimize occupational performance and participation” (Mori, 2015, p. 1).
- Sensory stimulation: stimulus that is used to get a reaction from one or more sensory systems
- Sensory input: any stimulus that causes a response

Chapter II: Literature Review

Overview of Autism Spectrum Disorder

Autism spectrum disorder (ASD) is a disorder characterized by difficulties in communication, social interaction, and repetitive behaviors (Nik Adib et al., 2019). The CDC (2014) stated "people with ASD may communicate, interact, behave, and learn in ways that are different from most other people" (para. 1). For children with ASD, sensory processing deficits have been known to cause difficulties with behavior and life skills. Individuals with ASD may experience hyper-sensitivities (over-responsiveness) or hypo-sensitivities (under-responsiveness) to sensory stimuli (Autism Speaks, n.d.). Many children with ASD also demonstrate poor social skills, impaired communication skills, and poor attention skills. Koegel, Bryan, Su, Vaidya, and Camarata (2020) stated that up to one third of individuals who have ASD are either nonverbal or minimally verbal, however, these individuals are able to learn a great deal of expressive language in early intervention programs.

Individuals with ASD may have troubles making eye contact or looking at objects when someone points to them, may experience difficulties with expressive and receptive language, trouble adapting to changed routines, and may be unaware of how to socially interact with others. Many children with ASD also experience comorbidities or pathophysiological abnormalities including higher rates of epilepsy, increased neurotransmitter deficiencies and metabolic disorders, poor sleep patterns, higher rates of immune disorders and gastrointestinal disorders (Frye & Rossignol, 2016). Children with ASD also experience higher rates of anxiety, depression, and obsessive-compulsive disorder (Crabtree et al., 2017). There are environmental, biological, and genetic factors that may make an individual more prone to having ASD. However, there is no medical test that can be done to diagnose ASD, therefore, practitioners

specifically look at behavior and developmental milestones to diagnose (Centers for Disease Control and Prevention, 2014).

Sensory Challenges

Children with ASD often experience sensory challenges. The child's vestibular, proprioceptive, visual, auditory, and tactile sensations can be highly impacted as they experience difficulties processing sensory input (Watling & Hauer, 2015). A child's ability to process sensory input impacts their participation and engagement in occupations including activities of daily living such as dressing and toileting as well as play, education, and social participation. Posar and Visconti (2018) explained a variety of sensory abnormalities that children with ASD experience including sensitivity to lights, intolerance to sounds, high or low pain tolerance, self-aggressiveness, smelling non-edible things, and oral exploration of objects. Posar and Visconti (2018) found that sensory experiences may lead to distress and anxiety for some individuals while for others it may lead to restricted or repetitive behaviors. Some behaviors that children with ASD may exhibit include hand flapping, rocking, spinning, withdrawal, ear covering, intense staring, and walking on toes (Posar & Visconti, 2018; Watling and Hauer, 2015).

Sensory processing.

According to Ismael, Lawson, and Hartwell (2018), there are four patterns of sensory processing identified including how a child registers sensory input (registration), a child who seeks sensory input (sensation seeking), a child who is sensitive to sensory input (sensory sensitivity), and a child who avoids sensory input (sensation avoiding). Ismael et al. (2018) found that "sensory processing influences participation in everyday life activities across occupations and contexts for children with ASD" (p. 6). The main activities examined in the study by Ismael et al. (2018) were education, leisure, social participation, mealtimes, and sleep.

Children who are sensory seeking may have difficulties in the classroom listening to instructions as they become distracted from other auditory input present in the classroom. Children who are sensory avoiding may have troubles with mealtime, sleep, and educational activities due to the inability to process sensory input. Children who are sensory avoiding try to avoid rich sensory inputs such as mealtime and auditory input. Ismael et al. (2018) stated "children with low thresholds of sensory processing tend to be challenged by activities that require specific sensory environments (e.g., mealtime, sleep)" (p. 7). Therefore, it would be beneficial for caregivers to learn what environments the child with ASD may optimally perform their activities.

It is evident that children with ASD may demonstrate significant difficulties with sensory processing and are known to be picky or selective eaters. Picky or selective eaters may demonstrate oral or tactile defensiveness. Cermak, Curtin, and Bandini (2010) stated "oral defensiveness, which may be a component of tactile defensiveness, is defined as an avoidance of certain textures of food and avoidance of activities using the mouth, such as tooth brushing" (p. 7). Oral defensiveness may result in over-responsiveness resulting in food selectivity or under-responsiveness in which the child does not perceive sensations when eating. Over-responsiveness may result in the child refusing foods with certain textures, while under-responsiveness to oral stimuli may result in the child over stuffing their mouth with food. Cermak et al. (2010) stated "although picky eating is not uncommon among young children who are typically developing, pickiness in children with ASD may be even more restrictive and may extend beyond early childhood" (p. 2). Picky eating may be a result of tactile or oral defensiveness therefore limiting the food repertoire of children with ASD. The child's food repertoire may be limited to as few as five foods creating concerns about nutritional adequacy due to aversions to textures, smells, and temperatures as a result of tactile defensiveness (Cermak, Curtin, & Bandini, 2010). Tactile and

oral defensiveness may pose problems in modulating sensory input and reflect as sensory defensiveness (Cermak et al., 2010). Studies have shown that sensory defensiveness or sensitivities may lead to the restricted diet that children with ASD demonstrate. The child's sensory sensitivities to tactile or oral input may be addressed by occupational therapists through intervention.

Occupational performance and sensory.

Mori (2015) stated that deficits in sensory integration can impact many occupations including activities of daily living (ADLs), play, work, education, and social participation. Many individuals on the autism spectrum require support and services to engage in the community productively and inclusively (Crabtree et al., 2017). Occupational therapists deliver services to enhance social participation, active engagement in activities, increase choice making, and improve self-advocacy. Not only do occupational therapists examine the child's participation in their main occupations such as eating, dressing, play, and education, they also assess emotional regulation, peer relationships/social interactions, waking/bedtime routines, and self-advocacy skills. The occupational therapist should be aware of any avoidance behaviors the child demonstrates due to sensitivities during occupations such as eating and dressing. To accommodate for sensitivities in children with ASD, the therapist may need to avoid certain foods or use clothing that the child can tolerate based on their sensitivity preferences.

The behaviors of children with ASD may have an impact on their family's participation and engagement in meaningful occupations, often influencing the family's daily routine, because of their sensory challenges. Larson (2006) stated that mothers of children with autism have had to restructure family life because of their children's unpredictable and difficult behaviors. Research has shown that families of children with ASD have had to create and maintain highly

structured routines for the child to complete basic care tasks such as eating, bathing, dressing, and grooming (Larson, 2006). Additionally, families may need to carefully select family activities and limit social events to keep the social environment as familiar as possible. By keeping the environment familiar, the child may experience less adverse reactions or outbursts to sensory stimulation. The product provides education and additional resources so the parents can meet the needs of their child by keeping the environment familiar in their daily routines.

Environmental factors and sensory.

Individuals with ASD may experience a variety of hyper-sensitivities and hypo-sensitivities to environmental stimuli. The sensory processing issues within the environment seen with children with ASD may involve any of the senses including sights, sounds, smells, taste, touch, balance, and body awareness (Autism Speaks, n.d.). When working with children with ASD, occupational therapists may have to adapt, modify, or alter the environment for the child to be able to achieve optimal performance in their daily activities. The context in which the child completes daily activities such as grooming, dressing, toileting, play, education, and social participation may include the clinic, school, or home environment. Sensory stimulation and over-stimulation occur in a variety of ways including sensitivity to different lighting, new or loud sounds, and unanticipated or unwanted touch (Autism Speaks, n.d.). Examples of accommodations for children with hyper-sensitivities to environmental stimuli include dimming the lights or using headphones for sounds/noise cancellation. For children with hypo-sensitivities to their environment, the therapist may implement heavy work into a session such as using a crash pad, climbing a rock wall, or swinging (Autism Speaks, n.d.).

Interventions.

Occupational therapy interventions may benefit children with ASD who experience sensory integration problems, sensory processing disorders, as well as behavioral problems due to sensory issues. Interventions for children with ASD should be occupation-based, and client centered in order to address the child's specific sensory challenges. Interventions should foster development, self-regulation and social participation using visual supports, modeling, and sensory integration among other strategies (Crabtree et al., 2017). Sensory-based interventions may target the child's vestibular, proprioceptive, visual, auditory, and tactile sensations to promote participation and engagement in meaningful occupations. Sensory integration and sensory-based interventions as well as cognitive approaches and video modeling have been found effective to achieve positive outcomes. Crabtree et al. (2017) stated "occupational therapy interventions through parent training, education, and coaching have been shown to reduce caregiver burden and decrease behaviors that interfere with daily functioning" (p. 4).

Watling and Hauer (2015) found that there continues to be limited research on sensory interventions as the evidence is limited in how sensory interventions are implemented, however, sensory integration interventions were found to improve the performance in occupations for children with ASD. It is apparent that applying adult-directed sensory modalities to the child in their natural environment has a positive impact on self-regulation, attention, and behavioral organization allowing them to successfully perform and meet environmental changes (Watling & Hauer, 2015). Common sensory based interventions that proved to be effective include but are not limited to weighted vests, brushing, bouncing on a ball, jumping on a trampoline, and other tactile options (Watling & Hauer, 2015). The therapist may also use sensory-stimulating toys, weighted blankets, or implement gross motor activity into the intervention session (Autism Speaks, n.d.). According to Padmanabha, Singhi, Sahu, and Malhi (2019), home-based sensory

interventions that were shown to be effective included music therapy, massage, and environmental enrichment. Items included in the home-based sensory kit included dough, rice, soft toys, music, and flashcards among many other items. Lord, Elsabbagh, Baird, and Veenstra-Vanderweele (2018), stated that "low-intensity interventions that coach parents on how to interact with their young child with ASD can result in immediate effects on children's social behavior and communication" (p. 10). Implementing these interventions can improve self-regulation to reduce behaviors caused by sensory stimulation. Additionally, sensory interventions help to alleviate stress on the families. Parent participation in early intervention can make an impact on the child's development as they grow into adults. Early intervention services are important to improve a child's development if diagnosed at a young age (Centers for Disease Control and Prevention, 2014). Koegel et al. (2020) found that outcomes are much greater when the parents implement interventions throughout the child's day. The outcomes of therapy would also improve if the parent were able to carry over intervention methods to the child's home environment. The sensory education program will help to educate the parents on a variety of sensory approaches that could be used at home to facilitate participation in daily routines and occupations.

Statement of Need

Bainbridge, Nasmith, Orchard, and Wood (2010) found that interprofessional collaboration increases patient outcomes. After much collaboration, it was found that the facility would benefit from more structured educational materials and training in the clinical setting in order to promote outcomes for children who have ASD and related sensory problems. Thus, a sensory education program was created to educate the interprofessional team and caregivers about sensory challenges that children with ASD may experience and what strategies they can

use to prevent or decrease the number of outbursts caused by over-stimulation, under-stimulation, and their potential impact on participation in meaningful occupations. The interprofessional team at this facility includes an occupational therapist (OT), board-certified behavior analysts (BCBAs), registered behavior technicians (RBTs), a psychologist, the facility manager, the facility assistant manager, educational trainers as well as the family members. Home programs have become increasingly more popular and beneficial in pediatric settings (Rone-Adams, Stern, & Walker, 2004). Home programs provide an opportunity for the child and families to transfer skills learned in the therapeutic environment to their natural home environment (Case-Smith, 2015). However, researchers reported limited caregiver participation in home programs and activities (Pappas, McLeod, McAllister, & McKinnon, 2008). Non-compliance with home programs is a major factor negatively affecting therapeutic outcomes of the child (Rone-Adams et al., 2004). Many caregivers are non-compliant with home programs due to lack of time, stress, and their expectations about their role as a caregiver (Patton & Hutton, 2016; Rone-Adams et al., 2004). Collaboration with caregivers will be beneficial to help promote compliance of home programs and buy in from families to carry over skills learned in the therapeutic environment to meet the child's specific sensory needs. Collaboration of the caregivers and interprofessional team is important to ensure consistent, continuous, and reliable care. Members of the interprofessional team must understand their own role on the interdisciplinary team and use their knowledge and skills to help the families meet the child's sensory needs.

Importance to Occupational Therapy

Occupational therapy interventions may benefit individuals of all ages who experience sensory integration problems, sensory processing disorders, as well as behavioral problems due

to sensory issues. Occupational therapists are professionals that provide individualized evaluations and goals to best fit an individual (American Occupational Therapy Association [AOTA], 2020b). Occupational therapy offers individualized interventions by analyzing environments and conducting activity analysis to provide a client-centered occupation-based approach for optimal occupational performance (AOTA, 2020b). Occupational therapists have specialized knowledge and skills to analyze the person, environment, and daily activities to create and implement appropriate interventions for occupational engagement and participation. It is the responsibility of the occupational therapist to collaborate with the interdisciplinary team, identify environmental supports/barriers, modify the environment, implement activities to support the child's sensory needs, and help the child and their caregiver to be aware of how sensory and behavioral difficulties may impact them in everyday activities. Occupational therapists have the skills and knowledge to use evidence-based research to provide appropriate sensory interventions that will increase the child's occupational performance in meaningful activities. Increasing opportunities to engage in sensory time will help to regulate a child's emotions, feelings, and behaviors in order to participate and engage in meaningful occupations. Occupational therapy interventions through parent training, education, and coaching have been shown to be effective in the carryover of home programming (Crabtree et al., 2017).

Theoretical Framework

The model chosen to guide this project is the Ecology of Human Performance (EHP) model (Dunn, 2017). EHP is designed to be used by interdisciplinary teams and considers the relationship between the person, tasks, context, and performance range focusing on how each component interacts with the other (Dunn, Brown, & McGuigan, 1994). The EHP model uses simple terms such as tasks instead of occupations which will contribute to the understanding of

the interprofessional team including occupational therapists, behavior analysts, behavior technicians, and other members of the leadership team. Dunn, Brown, and McGuigan (1994) stated "the person in this framework includes one's experiences and sensorimotor, cognitive, and psychosocial skills and abilities" (p. 4). The tasks are the behaviors or activities necessary to accomplish a goal based on the person's skills and abilities. The context refers to conditions that surround the person including physical, social, and temporal (Dunn, 2017). People use context cues to support performance of tasks. A person who is in their natural context has more environmental support and is able to participate and engage in their occupations more successfully than someone who is not in their natural context. Thus, it is important for caregivers to carry over skills used in the therapeutic environment to the child's natural environment for improved outcomes of therapy. Dunn (2017) stated "performance range is the number and types of tasks available to the person based on the interaction between the person's factors (skills, abilities, and motivations) and the context variables (the supports and barriers)" (p. 212). The child's performance range will be targeted by finding the context in which the child best performs their tasks.

Dunn et al. (1994) described the EHP intervention approaches as "a collaboration between the person/family and the occupational therapist directed at meeting performance needs" (p. 12). The five intervention approaches outlined in the EHP framework include establish/restore, adapt/modify, alter, create, and prevent. Dunn (2017) stated that the establish/restore intervention focuses mainly on the person to establish skills or restore skills that have been lost. Many children are establishing skills throughout their day at the facility to promote peer interactions, handwriting, and self-care. Task demands or contextual features are revised through the adapt/modify intervention approach to support performance in the child's

natural context (Dunn, 2017). The alter intervention approach focuses on the context in which the person performs (Dunn, 2017). The therapist finds the best match between the person's abilities and the context in which they are completing a task. Modifications to the context or environment may be recommended to assist the child with participation in their daily routines and activities. For example, the child may work better in a room where they are by themselves rather than in a room with peers present. The prevent and create approaches focus on the person, context, and task by preventing performance problems and creating circumstances that support optimal performance (Dunn, 2017). For example, at the autism therapy center, the RBTs should maintain a clear workspace to prevent distractions while the child is completing specific tasks. The interdisciplinary team and family should recognize barriers that are impacting the child's ability to perform tasks and create circumstances that support the child's performance when completing necessary tasks.

Conclusion

Based on a thorough review of available evidence, the literature review completed has shown that children with ASD experience many sensory challenges that impact their ability to participate and engage in meaningful occupations such as ADLs including grooming and dressing, education, sleep, play, and social participation. Addressing a child's sensory needs throughout the day in collaboration with occupational therapy is important for self-regulation of emotions, feelings, and behaviors to promote occupational engagement and participation. Current research shows that home-based intervention programs are effective and beneficial for families who have children with ASD, however, non-compliance continues to be an issue. Additionally, collaborating with the caregivers is essential to help promote compliance of home programs and carry over of skills. Thus, a sensory education program, guided by the EHP model,

was created to educate the interprofessional team and families on how to meet the child's sensory needs.

Chapter III: Methodology

The purpose of this scholarly project was to provide a sensory education program for an autism therapy center that included strategies to address sensory challenges for the interprofessional team and families to use outside of the therapy environment. This scholarly project was created to address the gaps in literature related to educating caregivers of individuals with ASD about sensory challenges that can be addressed to promote occupational performance. The project also addresses the gaps in parent education at the facility related to home programming and the carryover of skills to the child's natural home environment. Based on current research, it was evident that home programming has become increasingly more common and beneficial in pediatric settings, however, there was a lack of carryover from the therapy environment to the home environment. The EHP model helped to guide interdisciplinary use of intervention strategies in various contexts of the child's daily routine.

A thorough literature review was created by searching a variety of databases. Research databases were accessed through the Harley E. French Library of Health Sciences at the University of North Dakota. The databases searched included CINAHL complete, Google Scholar, and American Occupational Therapy Association. Additionally, occupational therapy textbooks and government-based websites such as Centers for Disease Control and Prevention and Autism Speaks were used to locate information. The following terms were searched in the research process: autism spectrum disorder, sensory, autism, and occupations. The main search phrases used included ("autism spectrum disorder" AND "sensory") and ("autism" AND "sensory integration"). The literature review included articles discussing autism spectrum disorder, children with ASD, sensory, and occupations. Any articles that were not related to EHP or to children with ASD who have sensory challenges were excluded from the literature review.

After completing research, summaries of key articles were completed which included the purpose, sample, method, results, and summary of each article. All the research used in the creation of this product has been determined to be credible and scholarly.

In addition to a literature review, an informal needs assessment was conducted through observation and informal interviewing to determine the needs of the facility by working collaboratively with the interprofessional team. As a result, there was an identified need for a sensory education program to educate the interprofessional team and caregivers about sensory challenges children with ASD may experience. The program will address the child's sensory needs and help to facilitate successful engagement and participation in the child's meaningful daily activities. Collaboration with the interprofessional team played a key role in the development of this product.

Additionally, the Ecology of Human Performance (EHP) model was chosen to be the best model to guide the development of the scholarly project. The interdisciplinary model was used to promote implementation of sensory strategies and home programming by families and the interprofessional team outside of the occupational therapy environment. This model implemented intervention approaches which were used to guide the development of the sensory strategies included in the sensory education program.

Chapter IV: Product

The product is a sensory education program that is intended to be used to educate the interprofessional team and families of children with ASD about sensory challenges children with ASD may experience and what strategies can be used to promote participation in occupations. The purpose of the product is to provide structured home programming and educational materials that can be distributed to families of children who have ASD and sensory related difficulties. The purpose of the sensory education program was to fill the gap in service delivery by providing education and strategies for families and the interprofessional team to use to address the child's sensory needs.

The sensory education program was focused on educating families and other caregivers about sensory strategies that address each sense including the vestibular, proprioceptive, auditory, visual, olfactory, gustatory, and tactile systems. The program includes sensory strategies that can be used to prevent or decrease the number of outbursts caused by over-stimulation, under-stimulation, and their potential impact on participation in meaningful occupations. Not only does the program address the child's specific sensory needs across different contexts, it also provides a variety of strategies as it is known that each child's sensory needs may differ. The sensory education program provides information on processing sensory input and provides details on the roles and responsibilities of each discipline on the interprofessional team. The product also includes supports and resources that the interprofessional team and family can utilize to navigate sensory challenges the child with ASD experiences. The sensory program was structured to allow families or members of the interdisciplinary team to implement the strategies within the program with flexibility based on the child's needs. Finally, a parent satisfaction survey has been provided in the appendices to

gather feedback for program sustainability and effectiveness. The survey will measure the effectiveness and user satisfaction of the program.

Role of Occupational Therapy

Occupational therapy plays an important role in identifying and treating sensory integration problems in children with ASD. Occupational therapists support the child's ability to fully engage in their meaningful daily activities and routines by addressing sensory challenges. The occupational therapist is responsible for collaborating with the interprofessional team and families to identify environmental supports or barriers to modify the environment. The sensory education program will help the occupational therapist to educate the interprofessional team and families on the implementation of sensory activities to support the child's sensory needs. In collaboration with an occupational therapist, the program will also help the child and caregiver to be aware of how sensory and behavioral difficulties may impact their participation in everyday activities. Collaboration with the interdisciplinary team and family is important so that the interventions carried over and implemented outside of the therapy environment will meet the child's specific needs.

Theoretical Framework

The goal of having EHP as a guiding theory for the sensory education program is to promote collaboration among the interprofessional team and the families by implementing sensory intervention strategies across contexts in which the child interacts. Using sensory strategies will help the child to self-regulate in order for them to participate and engage in their meaningful and necessary daily activities. The sensory intervention strategies are guided by the EHP model and will be developed and implemented by both the interprofessional team and the

families. It is important to note that the child may perform better in one context versus another based on sensory features available.

A primary goal of using EHP is to increase the child's performance range which is the tasks available to the child based on the interaction between person factors and the context variables. The use of EHP within the product will help to facilitate engagement in the child's meaningful occupations. This model supports interdisciplinary collaboration, therefore, the interprofessional team and families should collaborate during implementation of the product to identify supports and barriers within contexts in which the child interacts emphasizing the child's ability to increase their performance range. The interventions provided in the sensory education program may be used to optimize occupational performance in the child's daily activities.

Application of EHP contexts during implementation of the program:

- **Social contexts:** Incorporate the interaction and relationships between individuals, groups, or organizations.
- **Physical contexts:** Take into consideration aspects of the environment, including objects found within the environment such as tables and chairs.
- **Cultural contexts:** Take into consideration rules and expectations set forth by the interprofessional team and families based on their values and beliefs.
- **Temporal contexts:** The child's daily routine, family routines, duration, sequence, and time of daily occupations should be taken into consideration.

The five intervention approaches utilized within the program:

- **Adapt/Modify:** Task demands, or contextual features are revised to support performance in the natural context.

- **Alter:** Changing the context in which a person performs based on their current skills or abilities and context options that are available (e.g., a seat in the front row may provide fewer visual distractions versus a seat in the middle of the room).
- **Create:** Used to promote circumstances that support optimal performance.
- **Establish/Restore:** Focuses on establishing new skills or abilities or restoring lost skills or abilities.
- **Prevent:** Used to avert the development of a problem or occurrence with performance (e.g., prevent contextual factors from impacting engagement in attending a music concert by bringing ear plugs and carefully selecting a seating location).

The intervention approaches helped to guide the development of specific intervention strategies. They are intended to be used collaboratively with the interprofessional team and families when implementing the interventions from the sensory education program to increase the child's performance range in their daily occupations.

Summary

The sensory education program for the interprofessional team and families is supported by an extensive literature review, methodology, the EHP model, informal needs assessment, observation, and informal interviews. The sensory program was set up to allow families or members of the interdisciplinary team to implement the program with flexibility based on the child's needs. In conclusion, the main purpose of this scholarly project was to create a product that would provide an educational resource to the interprofessional team and families about the reasons children with ASD may experience sensory challenges and strategies to address the sensory challenges to increase the child's participation in necessary daily activities.

Dissemination of the product was carried out through an in-service to educate the leadership team at the autism therapy center about the sensory education program and its intended use. Ethical considerations acknowledged included the interprofessional team being mindful of the unique needs of the parents and children when implementing the program. This included but was not limited to their cultural differences, and recognition of the parents' levels of health literacy.

Chapter V: Summary

Many children with ASD experience hyper-sensitivities or hypo-sensitivities to sensory stimuli due to the inability to process sensory stimulation appropriately. A child's inability to process sensory input can negatively impact their performance range and ability to functionally engage in their meaningful occupations. Therefore, it is important to address the child's sensory challenges throughout the day by implementing sensory strategies to help regulate their body. This knowledge led to the creation of an educational program for caregivers to implement sensory strategies throughout the child's day to facilitate engagement in daily tasks and occupations.

After much collaboration with an autism therapy center, it was found that the facility would benefit from a sensory education program. Literature was reviewed related to ASD and the sensory related challenges children with ASD may experience. Following the development of the literature review, the product was created, with EHP as the guiding model, to support the specific needs of the population served by the autism therapy center. A sensory education program was created to educate the interprofessional team and families about sensory strategies that could be implemented by parents or caregivers outside of the occupational therapy environment to further meet the child's specific sensory needs. With guidance from the EHP model, the variety of strategies provided are intended to be used to prevent or decrease adverse reactions to sensory stimulation caused by over-responsiveness and under-responsiveness to sensory stimuli. The education program also addresses how the inability to process and interpret sensory stimuli may have an impact on participation in meaningful occupations. The program provides a variety of strategies addressing all sensory systems as every child's needs differ.

This product is designed to be implemented by members of the interprofessional team and the families in collaboration with an occupational therapist. It is intended for the interprofessional team to provide the sensory education program to the families under the discretion of an occupational therapist. Distribution of the product will positively influence the interprofessional team and families who care for children with ASD, improve the child's quality of life, and their ability to tolerate more sensory input throughout their days. Increasing the child's ability to process and interpret sensory input will help to facilitate successful engagement and participation in the child's meaningful occupations. Additionally, parent education and collaboration with the interprofessional team is important to support the child's needs and improve outcomes of therapy to increase their functional performance.

Some strengths of the program include adaptability, inclusivity, and flexibility. Although the program is specific to one region, the program can be easily adapted or modified to utilize at various autism therapy centers. The program is inclusive of all individuals with ASD who experience sensory related challenges and provides a variety of strategies to meet the specific and unique needs of each child. The sensory strategies provided in the program will help the child to regulate their body in order to better participate in activities at home and within the community helping the child to feel more included while engaging in their occupations. Additionally, a variety of sensory strategies were provided for flexibility in implementation as it is important to note that a strategy that works for one child, may not work for another child.

Limitations of the program include limited availability of an occupational therapist within the interdisciplinary team to recognize a child's specific sensory needs. Additionally, there is currently only one occupational therapist employed through this facility making it difficult to implement strategies and address sensory difficulties in collaboration with the interprofessional

team and families. Lastly, the sensory education program has not yet been implemented resulting in difficulties predicting challenges that may arise with implementation.

Overall, it is expected that the program will promote positive outcomes based upon family collaboration with the interprofessional team including an occupational therapist. In regard to implications, parent education is important for carry over of skills to help regulate the child's body to improve participation and engagement in occupations. Parents may benefit from further one-on-one education and in-home collaboration with an occupational therapist to address the child's sensory challenges. Implications for use of this product include expanding the sensory education program by providing additional strategies to use and examples of how the strategies can be applied based on the child's specific sensory needs. The program may be more beneficial with provision of a more inclusive application of EHP across contexts including the occupational therapy environment, ABA therapy environment, as well as the child's home environment.

With implementation of this product, the occupational therapy profession continues to expand the scope of practice for caregiver education and home programming in order to carry over skills to the natural environment. Implementing the sensory education program provides client-centered interventions to meet the child's individualized sensory needs. The product will provide in depth education and sensory specific strategies to address the child's sensory needs in their natural environment in order for the child to self-regulate their bodies to facilitate engagement in meaningful occupations.

It is recommended to pilot the sensory education program and determine the product's effectiveness through feedback and observation. The feedback provided by parents through the parent satisfaction survey is intended to inform the facility of strategies that were effective and

strategies that require recommended changes. It is recommended the product be given to families of children with ASD who experience difficulties processing sensory input in collaboration with an occupational therapist. If questions were to arise regarding the sensory education program, it is highly advised that the family reach out to an occupational therapist from the facility.

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