Occupational Therapists’ Role in Educating Caregivers on Pediatric Sensory Interventions Guided by Neurodiversity Principles

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Occupational Therapists’ Role in Educating Caregivers on Pediatric Sensory Interventions

Guided by Neurodiversity Principles

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Department of Occupational Therapy, University of St. Augustine for Health Sciences

A Capstone Presented in Partial Fulfillment
of the Requirement for the Degree of
DOCTOR OF OCCUPATIONAL THERAPY
University of St. Augustine for Health Sciences
May, 2023
Occupational Therapists’ Role in Educating Caregivers on Pediatric Sensory Interventions
Guided by Neurodiversity Principles

Department of Occupational Therapy, University of St. Augustine for Health Sciences has been approved.

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Guided by Neurodiversity Principles

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OCT 6832: OTD Capstone Experience 2

Dr. Smith

April 19, 2023
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Chapter 1: Introduction

The purpose of this proposal is to outline a capstone project. This chapter provides the background information about the neurodiversity movement, essential principles of the movement, sensory differences in neurodivergent pediatric development, and the traditional approaches used in occupational therapy (OT) for addressing sensory differences. A statement of the OT-related problem and rationale regarding how that problem would be addressed by the proposed project, the potential significance of the project, and defined learning and outcome objectives are outlined.

Background

Neurodiversity

The central premise of the concept of neurodiversity is that neurological variations in human development and functioning are like any other characteristic of human variation; these variations should not be considered pathological necessarily, but instead viewed as a valuable part of a person’s identity (Leadbitter et al., 2021). Neurotypical is the term that describes a person whose cognitive patterns function within dominant standards of “normal”, while neurodivergent is the term used to describe an individual whose mind functions in a significantly different way than the standards of “normal” generated by societal expectations (Walker, 2014). Children with neurodivergent-identifying conditions such as autism, attention deficit hyperactivity disorder (ADHD), sensory processing disorder (SPD), obsessive-compulsive disorder (OCD), and other learning disabilities (LD) are commonly referred to occupational therapy in pediatric settings to address occupational concerns related to their conditions, and continuously throughout their life span as needed (Kornblau & Robertson, 2021). Respecting a
neurodivergent person’s *autonomy, human dignity, and self-determination* are key principles of the neurodiversity movement that should take priority over known or suspected diagnoses (Therapist Neurodiversity Collective, n.d.-b).

The *neurodiversity movement* equates disability rights to basic human rights in that everyone should have equal access to opportunities and services regardless of their diagnosis. Hence, they should be granted *autonomy*, the right to pursue independent choices, and social agency in ways that are most comfortable for them (Dallman et al., 2022). Similarly, neurodivergent individuals have the right to live a life with *dignity* regardless of perceived impairment, meaning they have the freedom to discover meaningful, independently selected occupations and deserve respect from others in doing so (Dallman et al., 2022). *Self-determination* is a characteristic that begins developing in early childhood and is defined by Goldfarb et al. (2021) as motivated “behavior that is self-regulated, volitional, goal-directed, and autonomous” (p. 2). These three neurodiversity principles are derived from and can be triangulated with concepts from existing theories, such as the self-determination theory. The self-determination theory postulates that competence, social-relatedness, and autonomy are psychological needs that must be met to achieve self-determination; however, these needs often go unmet due to current methods of intervention for neurodivergent children (Goldfarb et al., 2021). To be a neurodiversity-affirming therapist is to uphold these principles during evaluation and intervention planning for neurodivergent clients.

Neurodiversity as a concept recognizes behavior as a natural and sometimes necessary response to stimuli and challenges the medical model, which focuses on identifying impairments and deficits, by celebrating autism and other identifying conditions as an inseparable component
of a person’s identity (Kapp et al., 2013). This emerging neurodiversity movement urges practitioners to refrain from assuming factors about autistic and other neurodivergent people based on normative value standards and presuming ideal levels of competence and capabilities for them to meet to achieve success and experience well-being (Kornblau & Robertson, 2021). However, these assumptions and presumptions often remain on the normative agenda among pediatric healthcare professionals and even among caregivers and may be limiting the quality of care that neurodivergent individuals receive.

Neurodivergent individuals experience various challenges living in a neurotypical society due to differences in their neurology, and may require therapeutic support (Dallman et al., 2022). While sensory differences occur in both neurodivergent and neurotypical people, those with neurodivergent conditions are more likely to experience extreme sensory processing differences or difficulties than are their neurotypical peers (Dunn, 2007). Neurodivergent children can experience over- or under-responsivity to typical sensations in the environment or express unusual sensory interests (Miller et al., 2020); subsequently, self-regulation in response to incoming stimuli might be impacted which can result in emotional or behavioral reactions that interfere with daily occupations (Leadbitter et al., 2021). Traditionally, neurodivergent children who experience difficulties with self-regulation are served by occupational therapist practitioners (OTP) using behavior-based approaches or sensory-based approaches.

**Behavioral Interventions**

Behavioral interventions are derived from theories of behaviorism and align best with the medical model of disability, which views deficits as human factors to be fixed by medication or rehabilitation. Complementing the medical model, early interventionists using behavior-based
approaches view autistic symptoms as pathological and therefore generate treatment goals aligned with eliminating autistic characteristics and implement treatments that make the child “no longer, or less, autistic” (Leadbitter et al., 2021, p. 2). For example, the following interventions are considered standard and appropriate intervention strategies built from behavioral models for autistic individuals: teaching a child to mask, or hide, their autistic traits, such as self-regulatory stimming behaviors; teaching whole-body listening, including eye contact; utilizing desensitization therapies to mitigate over-responsivity to stimuli; and implementing hand-over-hand to enforce behavioral compliance (Therapist Neurodiversity Collective [TNDC], n.d.-a). Further, these interventions may be taught to caregivers for implementation in home contexts. Goals that should be rooted in understanding sensory processing patterns and sensory health needs become behavior-related goals dependent on compliance and tolerance.

These interventions pose a direct threat to the development of autonomy, human dignity, and self-determination, the principles of the neurodiversity movement. Behavior-based interventions have detrimental effects on a child’s mental and physical development, including the loss of identity, depression, anxiety, and exhaustion (Stanborough, 2021). Preventing or altering regulatory behaviors can prevent a child from effectively expressing emotion or impact their ability to cope with their environment (Leadbitter et al., 2019). Instead, a thorough evaluation of the motivations behind intervention targets should occur, rather than assuming factors that make a neurotypical person’s life have value are the same for an autistic person (Leadbitter et al., 2021). In other words, if an irregular or atypical behavior does not impact the child’s functioning, it is not within the therapists’ or caregivers’ right to attempt to fix or normalize the child for the sake of society’s comfort.
Sensory Interventions

Other frames of reference commonly utilized by OTP are ones that directly address sensory processing differences. According to Dunn (2007), an individual’s ability to self-regulate can be discerned by their unique sensory profile and contributes to various behavioral responses, and these assumptions should guide intervention. Existing sensory models such as Dunn’s Sensory Processing model and associated interventions can accompany strengths-based approaches. However, they may not always be neurodiversity-affirming and are still rooted in research based on neurotypical, normative expectations. For example, the data collected to verify the validity of Dunn’s Sensory Processing Model was gathered from national samples of children and adults, both with and without disabilities, was distributed on a traditional bell curve and indicated that most of the population expressed moderate sensory responses (Dunn, 2007). While this is representative of the neurodiverse population as a whole, the data still allows for the idea that there are normative goals to be achieved for individuals with extreme sensory responses, since they fall outside of the majority.

The Sensory Therapies and Research (STAR) treatment model, another sensory-based intervention method developed by Dr. Lucy Miller, combines ideas of parent coaching with sensory integration theories, which focus on addressing the child’s sensory and motor differences (Miller et al., 2020). The model promotes a strengths-based stance and advocates for enhanced person-environment fits. However, there is still space for OTP using this model to maintain ideas that children have deficits due to their sensory processing patterns diverging from the baseline of “normal.”
Children who are neurodivergent are often expected to comply with neurotypical normative expectations; however, research is indicating that the push to meet neurotypical standards is incompatible with the development of autonomy, human dignity, and self-determination for these children (Leadbitter et al., 2021). Further, existing sensory interventions do not always highlight the importance of empowering self-determination, which is necessary for the development of intrinsic drives to achieve self-regulation. Therefore, there is a paucity of models and resources that thoroughly uphold the idea that neurodivergent sensory processing is neither normal nor abnormal, and the interventions based on existing sensory-based models are not necessarily crafted through the lens of neurodiversity principles.

_**Implications for Occupational Therapy**_

OTP have a unique opportunity to play a key role in incorporating neurodiversity-affirming principles into sensory-based interventions that support and advance the goals and occupations of pediatric populations (Kornblau & Robertson, 2021). OT is a profession that upholds a client-centered stance, implements evidence-based interventions, and is best-practice oriented (American Occupational Therapy Association, 2020). As the neurodiversity movement gains acceptance among healthcare providers and community at large, the logical evolution of OT practice is to align interventions and caregiver education with a neurodiversity-informed approach (Kornblau & Robertson, 2021). While there are readily available resources on behavior-based interventions and traditional sensory-based interventions, some therapists have expressed difficulty locating educational resources on sensory interventions that promote self-regulation explicitly with neurodiversity-affirming principles in mind.
There are existing continuing education resources available for OTP that address the need for enhanced and improved OT practices, supports, and services that are supported by neurodiversity-affirming principles. In addition, there has been an evolution in some pediatric OT curriculum reflecting the same ideas. According to Bathje et al. (2022), there have been recommendations to update OT curriculum to reflect best-practice in neurodiversity interventions. For example, the authors suggested specified content in alignment with the Accreditation Council for Occupational Therapy Education (ACOTE) requirements, such as considering adapting typical interventions and keeping ethical principles such as autonomy at the forefront of intervention implementation (Bathje et al., 2022). The challenge now for current, practicing educators and therapists is how to adapt existing interventions or create new ones that promote self-regulation in a neurodiversity-affirming way. With practitioners lacking updated resources within existing practice, it is that much more difficult for OTP to support caregivers in their understanding of their neurodivergent child’s needs for self-regulation.

Statement of the Problem

Occupational therapy practitioners lack educational resources for caregivers that promote self-regulation through neurodiversity-affirming sensory interventions.

Purpose Statement

The purpose of this project was to generate a resource for OTP promoting strategies for improving self-regulation through neurodiversity-affirming sensory interventions that can be utilized to educate caregivers of neurodivergent children.
Rationale for Proposed Project

There is a breadth of neurodiversity evidence circulating throughout the autistic population and various professions that work with clients considered neurodivergent. While advances are being made to discourage harmful and ableist therapy practices with neurodivergent children, practicing pediatric therapists have limited resources that translate this knowledge base into trauma-informed, culturally competent, respectful, and empathetic forms of service delivery (TNDC, n.d.-c). OTP must shift the focus of therapy, expand support, and enhance inclusivity efforts for autistics and other neurodivergent individuals receiving sensory-based interventions (Kornblau & Robertson, 2021). The first step in this greater effort is to improve awareness among unassuming caregivers regarding the implications of behavioral-based and traditional sensory-based therapy and the benefits of neurodiversity-informed sensory interventions for identifying populations.

Significance of the Proposed Project

Rather than targeting impairments alone in interventions, the OT profession must sharpen its scope of practice to support self-determination, empowerment, and inclusion of neurodivergent populations (Kornblau & Robertson, 2021). The project will have a significant impact on the overall occupational participation, performance, and well-being of neurodivergent children by encouraging caregivers to create environments that support the development of autonomy, dignity, and self-determination through sensory interventions. In addition, neurodiversity ideas can and should expand beyond OTP’s role in educating caregivers about neurodiversity principles and sensory differences to the practice methods and strategy implementations of all children's influencers. The resource created through this project will be
further utilized to enhance the understanding of neurodivergent concepts among other professionals who encounter and treat neurodivergent individuals, such as pediatricians, psychologists, physical therapists, speech therapists, and educators.

**Project Objectives**

*Learning Objectives*

1. Recognize and explore the occupational needs of pediatric, neurodivergent clients with sensory differences through findings in current literature.
2. Evaluate the neurodiversity paradigm, its essential principles, and its implications for pediatric OT practice.
3. Synthesize the literature to identify gaps or shortfalls in education and resources surrounding neuro-divergent affirming pediatric service delivery.
4. Utilize appropriate databases to assist in the continued literature search.
5. Determine the ideal deliverable and platform to communicate identified issues with the caregivers of neurodivergent children receiving OT.
6. Collaborate with stakeholders (professionals, caregivers, neurodivergent adults and children) with expertise on neurodiversity-affirming service delivery to understand and implement appropriate language use, goal-writing, and intervention strategies when serving neurodivergent children.

*Outcome Objectives*

1. Create educational modules for OTP to provide to caregivers that emphasize/explain how to provide sensory interventions supporting self-regulation and reflecting key principles of neurodiversity in home contexts.
Assumptions, Limitations, and Delimitations

The following assumptions, limitations, and delimitations defined the development of this project.

Assumptions

1. Neurodiversity principles should drive sensory-based OT interventions and caregiver education for identifying populations.
2. The majority of the neurodivergent population reject behavioral-based approaches to intervention and disagree with compliance to normative expectations.
3. Most of the autistic population accepts and identifies with the neurodiversity movement; they accept and encourage the use of neurodiversity-affirming interventions.
4. OTP want and need more clearly neurodivergent-affirming intervention resources for populations experiencing sensory differences.
5. The pediatric outpatient clinic will be invested in assisting in the development, implementation, and revision of the developed educational modules.
6. Practitioners and caregivers will disclose their perceived needs as related to education on neurodiversity-affirming principles and sensory interventions.

Limitations

1. Resources indicating how to apply neurodiversity-affirming principles to sensory interventions that are evidence-based are limited.
2. Neurodivergent-affirming principles are not consistently incorporated within treatment and parent-education throughout healthcare professions due to lack of explicit intervention resources.

3. Practitioners’ and caregivers’ eagerness to participate in the educational modules and feedback surveys is not guaranteed.

4. The experiential component of this project is bound by a 16-week experience, which influences the extensiveness of the educational resource being developed. The time to complete the project in total cannot exceed two trimesters in length.

**Delimitations**

1. The content covered in the educational deliverable will be limited to neurodiversity-affirming sensory interventions for pediatric clients. It will not expand on therapeutic applications for neurodivergent adult populations or interventions that do not fall within the scope of sensory-based OT due to the time constraints of the development process.

2. The deliverable of this project will be offered and piloted through caregivers, practicing pediatric OTP, and OT students. The implementation sites are a local outpatient therapy clinic, a local early education program, and an entry-level doctoral OT program.
Chapter 2: Literature Review

This literature review provides a comprehensive overview of neurodiversity concepts and how they relate to sensory-based occupational therapy (OT) interventions and subsequent caregiver education. The chapter discusses neurodivergence and autistics as a representative population, associated sensory differences for autistics and neurodivergent children, how sensory processing relates to self-regulation, OT’s role in supporting sensory differences and educating caregivers on the subject, and commonly utilized therapy interventions. The focus of this chapter is to highlight the significance of fostering environments that support the development of self-determination to achieve self-regulation in neurodivergent children.

Neurodiversity

*Neurodiversity*, a term loosely coined by sociologist Judy Singer in the 1990s and popularized by the early 2000s, describes the natural variation in human neurodevelopment (Walker, 2014). It is a paradigm shift away from the medical model, which maintains an over-focus on impairments and deficits (Pellicano & den Houting, 2021). According to the paradigm, neurocognitive functioning can vary from *neurotypical*, the perceived dominant style of thinking and processing, to *neurodivergent*, a style different from the established “normal” in ways of perceiving and responding (Walker, 2014). A group of *neurodiverse* people describes the existence of more than one cohesive style of neurocognitive functioning (Walker, 2014).

The core idea of the neurodiversity paradigm is that differences in one’s neurological makeup need not be pathologized or labeled as impairments. Neurodiversity proponents celebrate autism and other conditions alike as a natural part of human variation and strive to provide a platform wherein autistics can feel a group identity and express minority pride (Kapp
Neurodivergence is a framework that considers variations in human thinking, learning, and perceiving as natural differences and even strengths occurring in the development of the nervous system (Kornblau & Robertson, 2021). Neurodiversity aims to focus resources and research on existing individuals with autism rather than prioritizing research geared towards understanding causation and finding a cure or prevention of such diagnoses (Kapp et al., 2013). Hence, the paradigm posits that research focused on preventing neurodivergent conditions is futile and should instead be allocated to studies that will seek to understand group issues and support neurodivergent populations.

The neurodiversity movement maintains several essential principles: respecting autonomy, upholding dignity, and empowering self-determination. Autism and other neurodevelopmental conditions are natural and valuable components of human identity, not necessarily pathological conditions that need to or can be corrected (Leadbitter et al., 2021), so autistic children should be treated with the respect any neurotypical child would. While it is often argued that such an identity-first stance might disqualify autistic individuals from receiving disability services, the movement offers a modified definition of disability as the result of an interaction between an unaccommodating environment and an atypical individual (Leadbitter et al., 2021). Therefore, the concept does not ignore the challenges that autistics face daily but encourages increased support and inclusivity measures for all autistic individuals, regardless of their functional ability as perceived by neurotypicals. This includes fostering environments that respect the child’s development of autonomy and exploration of self-determination.

Additionally, neurodiversity proponents reject various extreme forms of therapeutic techniques that undermine autonomy and dignity, such as applied behavior analysis (ABA),
social skills training, and associated normalizing mechanisms with goals of reducing the expression of unwanted traits, known as “autistic masking” or "camouflaging” (Therapist Neurodiversity Collective [TNDC], n.d.-a). The principles of the neurodiversity paradigm support the idea that autistic individuals communicate and behave differently than, not inferiorly to, neurotypical individuals. These differences may not be necessarily disadvantageous and should not be the priority in therapeutic interventions since differences alone do not overtly inhibit occupational performance.

**Neurodivergent Conditions**

Neurodevelopmental disorders are identified in about one in every 10 children (Astle et al., 2021). Neurodevelopmental conditions, now synonymous with “neurodivergent”, include but are not limited to autism, attention-deficit/hyperactivity disorder (ADHD), sensory processing disorder (SPD), and other learning disabilities (LD). These conditions result in differences in the development of cognitive capacity, behavior, social interactions, academic performance, and lived experiences (Astle et al., 2021). Areas of notable difference for neurodivergent children, specifically for autistics, can include social and communication skills, engagement in play, sleep routines, activities of daily living (ADLs), academic performance, and sensory regulation and modulation (Kuhaneck, 2020). Sensory processing and self-regulation are common concerns associated with other neurodivergent conditions.

Autistics will represent the neurodivergent population throughout this proposal because of the large incidence of diagnosis and to reflect what exists in the literature on the topic. Since most autistic persons and autistic advocates endorse identity-first language over person-first language (for example, “autistic” versus “person with autism”), identity-first language will be
utilized throughout this proposal. However, it should be noted that language and identity preferences differ among individuals.

**Autism**

Autism is defined as a complex, lifelong neurodevelopmental condition in which cardinal traits are differences in the development of social, emotional, and communication skills (Centers for Disease Control and Prevention [CDC], 2022-b). It is vaguely understood that autism and associated developmental disorders occur from environmental influences and genetic factors (Fetit et al., 2021). Autistic persons frequently exhibit characteristic repetitive behaviors seen in daily routines and occupations and sometimes have hypersensitivity and/or hyposensitivity to various forms of stimuli (Fetit et al., 2021). The CDC (2022-b) estimates that one in every 54 children are diagnosed with autism, and it is four times more commonly diagnosed in males than females.

While autism can be diagnosed as early as 18 months, some children live years without a diagnosis since their behaviors may not match diagnostic criteria defined by the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5; CDC, 2022-b). Autism is a heterogeneous condition, meaning the neurobiological makeup, outward expression, and general progression can vary widely from person to person, making autism difficult to summarize as a generic profile (Watling & Spitzer, 2018). To qualify for a diagnosis of autism according to the language in the DSM-5, an individual must: exhibit persistent deficits in social communication and interaction across multiple contexts; show two or more symptoms identifying with repetitive, restrictive patterns of behavior, interests, or activities; and those symptoms must present in early
developmental periods, result in significant functional impairment, and be unexplained by other intellectual disabilities (American Psychiatric Association, 2013).

Autistic and other neurodivergent children are often referred to various forms of healthcare support to thrive within their neurotypically-dominated environments, depending on the severity and expression of their traits and the co-occurrence of other conditions. Those with motor and praxis delays or fine motor insufficiencies may seek OT and physical therapy (PT) (CDC, 2022-a). Those who communicate non-verbally or experience difficulty with mainstream forms of communication may receive services from speech-language pathologists (SLP) (CDC, 2022-a). Some children may be classified as having significant behavioral problems or are recommended for social skills training; they may be referred to ABA specialists (CDC, 2022-a). Pharmacological means are not typically used to treat autistic traits, as there is no cure for autism; however, medication might be utilized in treating co-occurring conditions or symptoms (CDC, 2022-a). For example, depression and anxiety symptoms may be managed with antidepressants, seizure disorders can be mitigated with appropriate medications, and stimulants might be prescribed to help children balance energy levels and improve focus (CDC, 2022-a).

**Sensory Processing Disorder (SPD)**

The focus of this project addressed the sensory processing and self-regulation differences neurodivergent children often experience, most commonly assessed by occupational therapy practitioners (OTP). The Sensory Therapies and Research (STAR) frame of reference proposes that sensory processing differences are classified under six different subtypes (Miller et al., 2020). Sensory processing is a variable in all individual’s neurological systems, but it can be defined as disordered when daily occupations are disrupted. SPD is clustered into sensory
modulation disorder, sensory discrimination disorder, or sensory-based motor disorder. Sensory modulation disorders are further specified as sensory over-responsivity, sensory under-responsivity, or sensory craving; these labels speak to a person’s ability to regulate sensations of any sensory domain and behaviorally respond within their environments (Miller et al., 2020). Sensory discrimination disorder refers to the inability to accurately perceive and interpret stimuli, either externally (i.e. sights or sound) or internally (i.e. bodily signals) (Miller et al., 2020). Sensory-based motor function disorders are further classified into dyspraxia or postural issues resulting from differences in sensory interpretation and processing (Miller et al., 2020). Sensory processing challenges can co-exist with neurodivergent conditions, leading to difficulties in emotional, behavioral, and sensory regulation.

Neurodivergence and Associated Sensory Differences

Differences in sensory processing often arise from neurological differences among people with neurodivergent conditions, resulting in “atypical” self-regulation processes and consequent expressed behavior. While SPD has been hypothesized to be a distinct disorder from neurodivergent conditions, it is a common co-occurring diagnosis in neurodivergent children (STAR, n.d.-a). Not all children with SPD have an autism diagnosis, but the STAR Institute (n.d.-a) research indicates that approximately 75% of autistic children also have an SPD diagnosis. According to Geschwind (2009), the percentage of autistic individuals who experience some sensory processing disturbance is estimated to be even higher, around 90%. Research also reflects that children with other neurodivergent conditions, such as ADHD, experience greater reactivity to sensations when compared to typically developing children (Ahn et al., 2014).
Participation in childhood occupations can be significantly impacted by differences in sensory processing and difficulties self-regulating. Sensory processing differences when combined with unaccommodating environments are associated with emotional and behavioral challenges, problems with communication, and negative mental health symptoms (Tomcheck et al., 2016). These differences, if not supported, can result in functional limitations for children, such as decreased participation in play occupations; decreased ability to adaptively respond to stimuli; poor development of fine and gross motor skills; and feelings of anxiety, discomfort, and distress, impending performance in life’s daily tasks (Ahn et al., 2004). Therefore, sensory processing and self-regulation is often a therapeutic goal for autistic and otherwise neurodivergent children.

**Theoretical Support**

**Self-Determination Theory (SDT)**

The SDT is a motivational theory used to build the foundation of this project. The SDT as originally theorized by Ryan and Deci (2000) organizes a human’s unique traits, including personality characteristics and self-regulation patterns, into hierarchies of motivational drives (Ryan & Deci, 2000). Internal motivation refers to one’s desire to seek challenge and explore individual capacity, while external motivation relies on social values, coercion, or tangible rewards or consequences (Ryan & Deci, 2000). The hierarchy of SDT states that people who are more intrinsically motivated generate higher levels of exploration and performance than individuals who rely on external forms of motivation (Ryan & Deci, 2000). The SDT assumes that one’s ability to self-regulate depends on how one internalizes social values and other extrinsic forms of motivation, making them personal values and self-motivating factors (Ryan &
Integrating extrinsic motivators and furthering development of self-motivation are essential to regulating emotions and behaviors (Ryan & Deci, 2000).

This theory further highlights three basic psychological needs that contribute to the development of self-determination: autonomy, competence, and relatedness (Ryan & Deci, 2000). Autonomy refers to free-will and volitional choice, competence conveys a person’s perceived ability to perform or master skills, and relatedness describes the feeling of meaningful connectedness to others (Goldfarb et al., 2021). Research shows that when these needs are met, a person is self-motivated and can effectively self-regulate; when thwarted, individuals experience decreased motivation and poor well-being, and consequently demonstrate poor attempts at self-regulating (Ryan & Deci, 2000). The SDT directly links to the core principles of the neurodivergent movement, which are rooted in fostering autonomy, competence, and relatedness for historically stigmatized individuals. Both the neurodiversity movement and SDT highlight the importance of developing intrinsic motivation to achieve a positive sense of self, efficient methods of self-regulation, and overall well-being.

**Person-Environment-Occupation-Performance (PEOP) Model**

The occupation-based model used to guide the development of this project was the PEOP model. The model views occupational performance as a product of interdependent variables: occupations, person factors, and environmental factors (Cole & Tufano, 2020). The PEOP model is based on ecological and transactional systems theories that consider the impact environments have on the outcomes of occupational participation, performance, and well-being (Cole & Tufano, 2020). The PEOP model, for purposes of this project, will examine personal factors of neurodivergent individuals with sensory processing differences, their selected meaningful
occupations, and how they intersect with supportive or inhibiting environments to influence self-regulation abilities during occupational engagement. Occupational therapists can use the PEOP model to support the implementation of interventions that promote the development of autonomy and self-determination while achieving self-regulation at the individual, group, or population level. Adjusting social and physical contexts can support a child’s intrinsic motivation to explore methods of self-regulation, alleviate perceived disability, and therefore improve performance in occupations and overall well-being.

**Views of Disability**

**Social Model of Disability (SMD)**

Another theory used to guide the project was the SMD. The SMD emerged in the United Kingdom when physical disability advocates argued for increased awareness of the definitions of *impairment* versus *disabled* (Oliver, 2013). The model posits that physical differences alone do not pose disadvantages for individuals, but society's physical and social infrastructure creates barriers, or *disability*, for such individuals (Dwyer, 2018). The SMD generated a movement among the physically disabled population, leading to legislative changes that promoted accessibility (Oliver, 2013). Therefore, it has been used both as a paradigm of understanding and as a political tool.

The SMD is now being applied to populations with disabilities that are less visible, such as those with mental health and neurodivergent conditions. Woods (2017) argues that the disabling barriers for autistics living in a neurotypical society are the negative language and stereotypes surrounding the condition. The “double empathy problem” evaluates how communication breakdowns that occur between autistic and non-autistic individuals do not
happen between two autistic people or two neurotypical people; therefore, these neurotypes just communicate differently, and neither form of communication should be considered deficit (Milton, 2012). However, the onus on compromising those differences is often on the perceived minority (that is, the neurodivergent person). The neurotypical world, socially and physically, is not inherently designed for neurodivergent individuals (Proff et al., 2022), so they experience increased barriers and consequently decreased occupational performance or increased occupational deprivation. This project followed the assumptions of the SMD, particularly the idea that disability results from poor person-environment interactions, not personal deficits. This project was designed to improve social and environmental experiences for neurodivergent children in everyday contexts. The main directives were to increase inclusivity and validation of autistic differences, foster self-determination, and promote improved occupational participation and performance.

**Medical Model of Disability**

Healthcare professionals consistently use the medical model, which focuses on identifying delays, deficits, and impairments, in treating patients with neurological differences, primarily due to the dependency on the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) for diagnostic categorization and for eligibility in receiving services and insurance coverage (Astle et al., 2021). The medical model has historically guided autism research, leading academic and professional directives to align with identifying causative agents and potential cures to the “disease” defined as autism (Pellicano & den Houting, 2021). This is largely due to the medical model’s assumption that traits diverging from societal norms imply a deficiency within an individual (Pellicano & den Houting, 2021). Since insurance coverage and service
acquisition is completely dependent on diagnostic status, the medical model is the prevailing theoretical lens for determining the nature and severity of neurodevelopmental conditions and subsequent treatment. This pathological view of such conditions leads medical professionals and adults in the neurodivergent child’s life to have a deficit view of the child’s way of being. Following the medical model, healthcare professionals, including rehabilitative therapists, have worked towards normalizing individuals, reducing outward symptoms of autism, and eliminating the overt presence of the neurological condition itself (Kapp et al., 2013). Therapeutic, pharmacological, and medical goals are often designed and implemented and their success determined by how much less a neurodivergent child’s atypical behaviors and social interactions are expressed.

This default view of disability is increasingly challenged by disabled persons, seen most relevantly in advocates for SMD and the neurodiversity movement. Neurodiversity proponents argue that deficit views derived from the medical model ignore autistic strengths by viewing differences as pathological, so they reject the idea that autism and neurodivergent conditions are disabilities that need to be cured (Dinishak, 2016). Neurodivergent advocates actively oppose the medical model’s deficit view, proposing that principles of the neurodiversity paradigm should instead be the basis on which healthcare service is structured (Pellicano & den Houting, 2021).

The medical model is also becoming more challenged by healthcare providers. Some critics have argued that a deficit view diminishes opportunities and can generate harmful personal and social consequences for groups like autistics (Dinishak, 2016). Deficit views inhibit the improvement of societal acceptance of neurodivergent individuals, hinder accommodation implementation for neurodivergent people who would benefit from them, and further perpetuate
the seclusion of neurodivergent persons (Walker, 2016). A shift away from the medical model and pathological view of autism and neurodivergent conditions is necessary to create change for such individuals.

**Role of Occupational Therapy**

As indicated by research, neurodivergent individuals with sensory differences may experience difficulties with daily occupations due to unaccommodating social and physical environments. Neurodivergent children with unique sensory processing differences benefit from OT to address self-regulation (Miller et al., 2020). The OTP in collaboration with caregivers can significantly impact a child’s development of identity and autonomy and are responsible for supporting children in learning about sensations and how to interpret bodily signals, efficiently self-regulate, respond effectively in their environment, and utilize self-advocacy when necessary. OTP are equipped with the knowledge about how sensory processing differences can influence a child’s ability to self-regulate and result in expressed behavior (Miller et al., 2020). The OTP can select and adapt assessments that accept and accommodate the unique attributes of the neurodivergent child during evaluation and treatment (Bathje et al., 2022). It is up to the OTP to determine if the methods chosen based on existing and commonly utilized models or theories are neurodiversity-affirming (that is, respecting the principles of autonomy, dignity, and self-determination). However, behavioral models and interventions are still unquestionably taught to students in OT programs’ pediatric curriculum and utilized in some circles of OT practice.
Behavior-based Interventions

Medical providers refer caregivers to ABA specialists when the caregiver’s primary concern is the child’s expression of non-preferred behaviors. Since ABA approaches target “atypical” behavior for the sake of conformity, the techniques are in direct conflict with the principles of the neurodiversity movement. Still, they are marketed as the most effective “gold-standard” and “evidence-based” interventions to target autistic behaviors and enforce compliance via a system rooted in rewards and punishment (Dallman et al., 2022). Types of ABA approaches include Discrete Trial Training and Pivotal Response Training (CDC, 2022-b). Further, specific behavioral intervention strategies falling within these categories include reward and punishment systems, “first-then” strategies, hand-over-hand to force compliance, and planned ignoring (Dallman et al., 2022). These interventions are often utilized to eliminate non-preferred behaviors and reinforce behaviors deemed “appropriate” under neurotypical standards that might be difficult for some neurodivergent children, such as participating in eye contact, reducing outward stimming such as hand flapping, and completing tasks in a neurotypical way without considering inherent autistic differences (Dallman et al., 2022). Behavior-based interventions, which OTP sometimes utilize, are designed to target overt behavior rather than address the root causes of behavior, which are often unmet sensory needs.

Trauma Related to Behavioral Interventions

The stigma surrounding autistic differences continues to prevail and is enforced by interventions designed to normalize autistic behavior. *Masking* is often the result when behavioral approaches are used during therapy. Masking is the suppression of certain personality traits or behaviors and can include limiting sensory-related coping mechanisms, such as
stimming; behavioral therapies encourage masking these exact behaviors by training autistic children to hide them or express feelings “appropriately” (Pearson & Rose, 2021). Pearson and Rose (2021) discuss how masking, whether consciously or unconsciously, results from autistic persons attempting to conceal traits of theirs that have been labeled as impairments by society; this coping mechanism, while alleviating social consequences, can lead to detrimental mental health issues, dissolved sense of identity, and autistic burnout. Additionally, negative life experiences like bullying and other forms of victimization can lead the autistic child to feel pressured into hiding or camouflaging characteristics central to their identity (Pearson & Rose, 2021). Thus, children who have experienced compliance-driven behavioral therapy are likely to develop trauma, which can further negatively impact engagement and performance in daily occupations. Behavioral approaches to therapy, which target “problematic” behavior and not the sensory-related roots of behavior, can initiate a cycle of exhaustion, self-doubt, anxiety, depression, and even internalized ableism with long-lasting effects on the neurodivergent child.

**Sensory-Based Intervention**

Alternatives to behavior-based treatments for addressing dysregulation are sensory-based interventions such as Ayres Sensory Integration, Dunn’s Sensory Processing, or the Sensory Therapies and Research (STAR) frame of reference. During sensory-based interventions, occupational therapists play a vital role in teaching children how their bodies process sensory information, how to interpret and organize the sensory input, and how to respond within their environment. According to Rhodus et al. (2022), many pediatric occupational therapists utilize sensory-based therapeutic interventions and strategies to support neurological development and
regulation in a habilitative approach. To best understand sensory processing differences and how they relate to self-regulation, the STAR treatment model can be examined.

The STAR approach is a frame of reference blending principles of the Developmental, Individual-differences, and Relationship-based (DIR) therapy, which focuses on the parent-child relationship and uses coaching models to develop unique sensory lifestyles, with traditional sensory integration theories developed initially by Dr. Jean Ayres (Miller et al., 2020). The STAR approach is a flexible therapeutic framework with theoretical principles based on dynamic systems theory. It acknowledges the individual child’s needs, organizes treatment to the child’s and parent’s priorities, and can be used to integrate strategies into natural environments (Miller et al., 2020). It is also a child-centered framework that encourages therapists and caregivers to join the child in their chosen activities or interests with full immersion, which elicits “flow”, or complete presence in the process with little focus on the product of an activity (Miller et al., 2020). It promotes a child’s independent exploration without pressures to perform and achieve certain skills.

The STAR model recognizes that caregivers profoundly impact the child’s regulation, beginning in infancy, and continuous development of self-regulation as the child grows older. Parents, through this lens, can be the primary agent of positive change. Without supportive relationships built by caregivers, children with sensory processing differences might limit their exploration of play and self-regulating strategies or activities (Miller et al., 2020). For children, occupations are supposed to bring about joy and feelings of accomplishment so the framework is designed for therapists to coach parents in engaging in the child’s self-chosen play schemes and
empowering their children to explore and make active choices in their environment (Miller et al., 2020).

The STAR treatment model complements elements of the SDT and principles of the neurodiversity movement. Under its assumptions, sensory experiences can help regulate arousal levels and increase awareness while targeting a child’s intrinsic motivation and supporting their autonomy (Miller et al., 2020). Further, self-regulation will develop more effectively through caregivers’ provision of sensory-rich and sensory-safe opportunities without expectations or judgments made to performance or tolerance of activities.

**Interoception, Alexithymia, and Dysregulation**

Interoception and alexithymia have become pivotal concepts as more is understood about the influences on and development of self-regulation. **Interoception** refers to the sensory system that detects internal bodily signals, which are interpreted as the foundation for self-regulation and identification of emotional states (Mahler, 2022). **Alexithymia** is a personality trait defined as the inability to identify and describe one’s physical feelings or emotions (Gormley et al., 2022). Alexithymia has been correlated with “low registration” profiles of sensory processing (Dunn, 2007) in autistic individuals, indicating that interoceptive differences are directly linked to emotional interpretation and therefore regulation (Milosavljevic et al., 2016). Studies have shown that autistic children often experience differences in interoceptive processing (Proff et al., 2022) and alexithymia more than their neurotypical peers (Milosavljevic et al., 2016). Additionally, higher alexithymia levels are correlated with higher emotional dysregulation (Gormley et al., 2022). This research indicates that interoceptive awareness is essential in
relating feelings within the body to emotional responses and vice versa; poor interoceptive awareness contributes to potential problems with emotional and behavioral self-regulation.

Interoception-based intervention programs have emerged as a sensory-based method to address emotional and behavioral regulation. Mahler et al. (2022) conducted a study to evaluate the effectiveness of an interoception-based curriculum in improving emotional regulation. The program focused on teaching children to recognize interoceptive signals, interpret the sensations into emotions, and explore comforting “feel-good” actions (Mahler et al., 2022, p. 4). The results indicated that the protocol effectively improves emotional regulation in autistic children and suggest that the interoception curriculum can potentially improve alexithymia (Mahler et al., 2022). These processes have the potential to be neurodiversity-affirming, so long as they do not impose emotion or feeling labels onto children, acknowledge that some children choose not to feel, and respect the child’s intrinsic experience as valuable and authentic.

**Monotropism and Self-Regulation**

Another topic intertwined with theories of sensory regulation is monotropism. *Monotropism* describes an autistic individual’s limited but intense attention patterns to highly specific interests (Proff et al., 2022). The monotropic theory assumes that a neurodivergent individual who allocates high levels of attention to few interests will have less interests overall than a neurotypical individual (Murray, 2005). Participation in these self-chosen interests and/or actions tends to bring joy and excitement, and conversely, if interfered with, severe dysregulation (Murray, 2005). Hyper-focus on special interests and associated repetitive behaviors such as stimming are speculated to be a mechanism used to mitigate stimuli (perhaps to filter out overwhelming sensory input) and regulate attention and arousal in neurodivergent individuals.
Monotropism is a method of achieving “flow” for an autistic individual, and disruptions in that flow will require more extensive effort to attend to other tasks or engage in processing (Murray, 2005). When hyper-focus on activities and behavioral stimming is treated as a trait that must be altered, suppressed, or used as a reward for compliance, this can lead to confusion, anxiety, and difficulty developing authentic intrinsic motivation to self-regulate.

**Neurodiversity-affirming Treatment Approaches**

Neurodiversity-affirming treatment approaches are interventions designed to respect autonomy and dignity and foster self-determination. As of yet, no confirmed evidence-based methods exist to provide sensory interventions that explicitly respect these principles. Dallman et al. (2022) have proposed several intervention approaches alternative to behaviorism techniques that are considered more respectful and neurodiversity-affirming towards neurodivergent clients. Neurodiversity-affirming intervention design should begin with an evaluation of whether the goal of intervention is to reduce a neurodivergent behavior central to the person’s identity (Dallman et al., 2022). In other words, autistic behavior should never be the targeted goal of therapy, nor should a diagnosis of autism be a reason alone for seeking occupational therapy services (Dallman et al., 2022). Additionally, therapists should ask themselves if they would utilize the same intervention approach with a neurotypical child.

Specifically considering sensory interventions, some alternatives to planned ignoring and token economics seen in behavioral approaches to address meltdowns or aggressive behaviors might include co-regulation, modifying the environment to avoid sensory-related triggers in advance, and supporting the child’s sensory needs to return to a regulated state (Dallman et al., 2022). In addition to providing external sensory support, therapists should consider the
contribution of alexithymia and potential interoception difficulties in their intervention processes. Therapists should also recognize monotropic and stimming behaviors as a vital tool of self-regulation and sensory processing or as a sign of dysregulation rather than target those behaviors as negative symptoms of neurodiversity (Dallman et al., 2022). There is still limited clarity on how these strategies might improve intrinsic motivation and foster self-determination in children. There are also limited resources communicating this information to caregivers, who are the primary source of support throughout a child’s developmental years.

**Existing Educational Resources**

There are continuing education courses for practicing therapists covering neurodiversity topics and neurodiversity-affirming practice. However, a search in the American Occupational Therapy Association (AOTA) database of continuing education seminars revealed only one result on the topic (AOTA, n.d.). The STAR Institute hosts various continuing professional courses, education seminars, and virtual summits for practicing therapists, individuals, and parents (STAR Institute, n.d.-b). They offer intensive mentorship programs for OTP to learn about the latest research regarding SPD and other skills required to obtain a STAR Proficiency Certification (STAR Institute, n.d.-b). In addition, they host Neurodiversity Fireside Discussions for OTP, which are virtual sessions on how to implement neurodiversity-affirming methods into practice (STAR Institute, n.d.-d). For caregivers, STAR Institute has free resources for sensory-based home activities; this page on their website describes to parents how to implement thoughtful strategies in promoting a child’s sensory regulation during various daily activities (STAR Institute, n.d.-c). While informative, these resources are limited in evidence-based
examples of interventions that explicitly enforce the idea of fostering self-determination through sensory-based activities.

Interoception-based interventions are also becoming well-understood and practiced. Kelly Mahler, MS, OTR/L created a course called The Interoception Curriculum, which teaches therapists and caregivers how to utilize evidence-based support to help children discover and understand their interoceptive systems to improve body awareness and self-regulation (Mahler, 2022). These methods can be neurodivergent affirming since they validate the child’s sensory experiences and support them in their journey to understanding their bodies. She provides caregiver-directed information on her website, describing interoception and its role in daily living, but she urges parents with concerns to implement The Interoception Curriculum independently. While this may work for some involved and dedicated caregivers, not all caregivers have the time to devote to such a program. In addition, the program is costly and does not encapsulate other sensory-related problems pertaining to the seven other sensory systems that caregivers of neurodivergent children may encounter.

The Therapist Neurodiversity Collective (TNDC) houses a collection of resources for therapists. Their webpage to the public has a section containing information about ABA, other forms of behavioral therapies, and why the methods undermine human autonomy and dignity (TNDC, n.d.-a). The webpage also offers recommendations alternative to ABA, such as speech-language and occupational therapy (TNDC, n.d.-b). While the resources address the potential harms of behavioral therapy and provide different avenues for caregivers seeking healthcare provision, there is limited information on how sensory-based dysregulation are the roots of “challenging” behavior. Additionally, most of their educational resources are designed to educate
therapists rather than neurodivergent children’s caregivers, and not all therapists are members of the collective to access the exclusive membership material and provide it to parents.

Discussion

Interpretation of the Literature

The results of this literature review suggest that it is now more widely acknowledged that difficulties experienced by individuals who have clinical diagnoses such as autism, ADHD, SPD, and LDs might simply be attributed to poor person-environment arrangements; the societal determination of which behaviors are appropriate and inappropriate is what elicits challenges for these individuals (Kapp et al., 2013). The neurodiversity paradigm calls for OTP to reassess their theories, models, frames of reference, and intervention practices through the lens of the principles of neurodiversity. The end goal of sensory-based OT is to enhance sensory experiences, promote regulation, and improve adaptive responses from the child during daily occupations (Cole & Tufano, 2020). Framing sensory interventions through neurodiversity principles is essential to ensure the therapists and caregivers are promoting autonomy, dignity, and the development of self-determination, each of which are factors in effective self-regulation, in everyday contexts. Translating supportive experiences to home environments requires OTP to educate caregivers in concepts that guide sensory intervention, but resources that would facilitate these conversations are lacking.

Significance of the Literature

The literature reviewed has highlighted the importance of aligning existing interventions with principles of neurodiversity for pediatric clients. The principles of autonomy, dignity, and
self-determination are gaining popularity among neurodiversity-affirming healthcare practitioners in occupational and speech therapies. However, caregivers may still be unknowledgeable about the root causes of their children’s behaviors and how to intervene respectfully in ways that uphold said principles. They often require extensive education on how best to support their child at home, which is identity-affirming and supportive of their differences, rather than teaching them to mask and “perform” to please others around them, which is still a common goal among providers.

**Application of Theory**

The evidence in the literature about the neurodiversity paradigm supports the SDT. For a child to efficiently self-regulate, they must be presented with opportunities that empower them to explore their environments without the threat of social consequences. Respecting children’s autonomy, fostering competence, and nourishing feelings of relatedness while supporting their sensory needs through the STAR treatment approach will initiate intrinsic patterns of motivation, enabling children to discover self-regulatory strategies that are effective and meaningful to them as individuals. The literature also supports the SMD in that neurodivergent proponents believe neurological differences should not be equated with deficits but viewed as basic human differences. Conversely, the evidence in the literature suggests that the medical model as a view of disability for neurodivergent children undermines autonomy, dignity, and self-determination, since deficit views derived from it encourage goals to “fix” the neurodivergent child.

**Implications for OT Practice and Research**

This literature review underscores several implications for OT practice. With expanding knowledge about neurodiversity, OTP are asked to reassess their treatment methods and
supporting theories when providing services to neurodivergent children. Implications for intervention include increasing the focus on fostering intrinsic motivation and emphasizing self-determination and advocacy as essential outcomes of all interventions (Tomcheck et al., 2016). Implications for future research include expanding the platform for autistic perspectives in the literature to increase understanding of self-regulatory experiences and meaningful occupations and how those might look different for neurodivergent clients (Pellicano & den Houting, 2021).

Much has been discussed about what is not supported by the principles of the neurodiversity movement, including the rejection of medical and behavioral models (Dallman et al., 2022). However, evidence regarding what is neurodiversity-affirming in nature requires OTP to seek continuing education resources on the topic if they are interested in expanding their knowledge. Further, there is a lack of evidence-based interventions structured around neurodiversity-affirming principles and, therefore, a lack of materials to use in educating caregivers on related topics.

**Conclusion**

Educational resources for OTP to administer to caregivers explaining neurodiversity concepts and how they apply to sensory processing differences and connect to behavior are lacking. Caregivers require further education on relevant subjects to support their child effectively in the home environment. In reality, OTP (as well as speech and physical therapists, psychologists, etc.) are often the primary source of education regarding a neurodivergent child’s sensory differences, and caregivers rely on them when learning appropriate intervention strategies that can be translated into home contexts. Practitioners would greatly benefit from resources that can be easily referenced by family members when they have concerns related to
their child’s sensory differences or are unaware of how neurodivergent traits might impact a child’s daily functioning.
Chapter 3: Project Methods

The purpose of this capstone project was to generate a resource for occupational therapy practitioners (OTP) promoting strategies for self-regulation through neurodiversity-affirming sensory interventions that can be utilized to educate caregivers of neurodivergent children. Though OTP can be significant agents of change in affirming neurodivergent ways of being (Dallman et al., 2022), the neurodiversity movement has gained popularity faster than supportive resources have been developed. The literature review and needs assessment completed established the potential impact of novel educational modules for therapy practitioners that could be provided to caregivers improving communication of concepts of self-regulation through the lens of neurodiversity principles. The long-term goals of this project for OTP and caregivers were to promote a better understanding of how neurodivergent persons view their own conditions, how self-regulation needs of neurodivergent children differ from neurotypical children, how to better serve neurodivergent populations through neurodivergent-affirming sensory interventions, and how to implement those strategies in daily contexts. This chapter outlines the methods used in creating and evaluating the educational modules for OTP and caregivers of neurodivergent children with sensory processing differences.

Objectives

The learning and outcome objectives for the project are stated below. Following are further specified project objectives for achieving the outcome objective.

Learning Objectives

1. Recognize and explore the occupational needs of pediatric, neurodivergent clients with sensory differences through findings in current literature.
2. Evaluate the neurodiversity paradigm, its essential principles, and its implications for pediatric occupational therapy (OT) practice.

3. Synthesize the literature to identify gaps or shortfalls in education and resources surrounding neuro-divergent affirming pediatric service delivery.

4. Utilize appropriate databases to assist in the continued literature search.

5. Determine the ideal deliverable and platform to communicate identified issues with the caregivers of neurodivergent children receiving OT.

6. Collaborate with stakeholders (professionals, caregivers, neurodivergent adults and children) with expertise on neurodiversity-affirming service delivery to understand and implement appropriate language use, goal-writing, and intervention strategies when serving neurodivergent children.

**Outcome Objectives**

1. Create educational modules for OTP to provide to caregivers that emphasize/explain how to provide sensory interventions supporting self-regulation and reflecting key principles of neurodiversity in home contexts.

**Project Objectives**

1. Observe sensory-based OT service delivery to neurodivergent persons.

2. Interview key stakeholders (autistics and other neurodivergent individuals, their caregivers, practitioners) about their perspectives on existing educational resources and how they might better align with neurodiversity principles.

3. Develop educational modules for OTP to provide to caregivers that articulate neurodiversity principles, describe sensory processing differences, and provide
neurodiversity-affirming sensory interventions that support self-regulation for use in home contexts.

4. Receive University of St. Augustine for Health Sciences (USAHS) Institutional Review Board (IRB) approval to assess the modules’ effectiveness via analysis of pre-and post-surveys completed with subjects from each dissemination site.

5. Pilot the educational modules and pre-and post-surveys with participants from an outpatient pediatric therapy clinic, early education program, and pediatric course in an entry-level doctoral OT program.

6. Present findings via a poster at the USAHS Doctor of Occupational Therapy capstone symposium.

7. Apply to present on the topic of neurodiversity and sensory-based caregiver resources at a state, national, and/or international OT conference.

**Participants and Settings**

Developing and implementing the educational modules required partnership with a group of OTP, ideally in a pediatric therapy clinic or program, where a large portion of clientele are neurodivergent with sensory processing differences. Therefore, the educational resource was created and developed for utilization primarily in an outpatient pediatric therapy clinic in Buda, Texas. The experience and collaboration took place with the Therapy Center of Buda (TCOB) from November 2022 until March, 2023. The clinic is owned and operated by a speech-language pathologist (SLP) who values neurodiversity principles and employs OTP and SLPs who practice neurodiversity-affirming interventions. The experience site provided access to stakeholders, including neurodiversity-affirming practitioners (three occupational therapists, and four speech therapists), neurodivergent children, the children’s caregivers, and autistic adults and advocates.
within the community. The stakeholders participated in informal interviews to help inform the development of the educational modules. Once developed, the modules were piloted through practitioners and caregivers at TCOB who participated in pre-and post-surveys which assisted in the evaluation of the resource’s effectiveness.

Additionally, the completed educational modules were piloted through caregivers recruited from the Rise School of Austin (RSA), an early childhood education program serving children ages 12 months to five years old. RSA operates from an inclusive model, incorporating children of all abilities into classroom and therapeutic activities. The program prioritizes family-centered services and invests in caregiver education. Participants were asked to complete the pre- and post-surveys as well to evaluate the modules’ effectiveness.

Lastly, the educational resource was also disseminated for feedback among the OT faculty and students enrolled in the spring 2023 pediatric course of the entry-level doctoral OT program at Arkansas Colleges of Health Education (ACHE) with the same pre-and post-surveys. In addition, the information gleaned from the development of the educational resource contributed to creating a supplementary presentation for the ACHE student’s pediatric curriculum and a continuing education workshop for professionals in the community.

Development Process

Pre-Development Phase

Research, clinical observation, and interaction with pediatric neurodivergent clients and their caregivers informed the development of the educational resource. To accomplish this, the capstone student observed clinical practice and interviewed practitioners with experience using neurodiversity-affirming sensory interventions with this population. Field notes were completed during observation at TCOB to document findings and as an opportunity for self-reflection (see
Appendix A). TCOB was also used to approach stakeholders (practitioners, neurodivergent children, and their caregivers) who value neurodiversity principles and have experience using various educational resources. They were recruited for informal consultation (see Appendix B) prior to the module development and provided their perspectives about their current understanding of neurodiversity principles, sensory processing differences in their children, and what they have and lack in educational support. In addition, the autistic community and neurodivergent population must lead the neurodiversity conversation (Pellicano & den Houting, 2022). Autistic adults and other neurodivergent advocates in the community were recruited for similar informal interviews during this phase to provide input on the development and presentation of the resource. These semi-structured interviews were conducted informally; thus, they were not submitted for approval to the IRB.

Development Phase

The development phase utilized the information gathered from informal interviews with stakeholders and observations in the clinical setting during the pre-development phase. The module development was guided by the Self-determination Theory (SDT), the Sensory Therapies and Research (STAR) frame of reference, and the Person-Environment-Occupation-Performance (PEOP) model. SDT assumes that intrinsic motivation will develop once a person’s needs for autonomy, relatedness, and competence are met (Ryan & Deci, 2000). The STAR frame of reference for sensory processing compliments the SDT in that sensory exploration should be child-led, involve caregivers, and provide opportunities for success (Miller et al., 2020). The PEOP model describes the transactional relationships between personal characteristics and environments and how they impact occupational participation, performance, and well-being (Cole & Tufano, 2020). These ideas informed the educational modules, reflecting the importance
of considering interactions between internal and external factors when addressing dysregulation in neurodivergent children. The modules highlight the importance of providing exploratory, sensory-rich opportunities and appropriate challenges during childhood occupations while respecting neurodiversity principles, which should result in improved intrinsically motivated self-regulation and occupational performance in neurodivergent children.

**Strengths, Weaknesses, Opportunities, and Threats (SWOT) Analysis**

In the initial stages of development, a SWOT analysis was completed to guide planning and decision-making (Community Tool Box, n.d.). The SWOT analysis was presented and discussed with the site supervisors at TCOB at the start of product development during week two of the capstone experience. Through collaboration with the supervisors, decisions on the ideal platform in which the educational modules would be presented, specific topics to be included, and the organization of those topics were made.

**Educational Resource Outline**

The following outline summarizes the organization of the educational modules.

- **Module I: Neurodiversity**
  - Introducing Sam: A Case Study
  - What is Neurodiversity?
  - Neurodiversity Principles
  - Views of Disability
  - The Double Empathy Problem

- **Module II: Sensory Processing and Self-Regulation**
  - Basic Overview of the Sensory Systems
  - Interoception and Alexithymia
Monotropism
Identifying Regulation and Dysregulation
Meltdowns, Shutdowns, and Burnout

- Module III: Neurodiversity-Affirming Interventions
  - Traditional Therapy: What is Recommended?
  - Effects of Behavioral Interventions
  - Neurodivergent Perspectives
  - Neurodiversity-Affirming Interventions
  - Neurodiversity-Affirming Sensory Intervention Starting Blocks
- Additional Resources

**Implementation Phase & Data Collection**

The educational modules were implemented for use through three different sites. The TCOB outpatient pediatric clinic was used to reach caregivers of neurodivergent children enrolled in therapy services. Through the outpatient setting, the educational modules were administered for use at home, allowing for self-paced completion of the material. Similarly, the modules were provided to caregivers of learners at RSA, who completed the material remotely in and on their own time. At ACHE, the educational modules were provided to a group of doctoral OT students enrolled in the pediatric course during the spring 2023 term before presenting to their class. Dissemination at three different sites provided an opportunity to receive feedback and perspectives from diverse caregivers, practitioners, professionals, and OT students.

**Survey Methods**

**Research Questions.** The student investigator assessed the effectiveness of the educational resource once developed. The following research questions were posed:
1.) What are caregivers’ and practitioners’ baseline understanding of neurodiversity principles, sensory processing differences, and self-regulation in neurodivergent children?

2.) After utilizing the educational modules, do caregivers and practitioners have a better understanding of how to implement neurodiversity-affirming sensory interventions that promote self-regulation for neurodivergent children?

It was hypothesized that after completion of the educational resource, caregivers, OTP and OT students would have an improved understanding of neurodiversity, sensory processing, and self-regulation compared to their baseline understanding prior to module completion.

Participant Recruitment. The approval of the IRB was required to disseminate data collected through survey research. An application to the USAHS IRB was drafted, submitted, and approved before initiating survey participation recruitment. The supervisors at each experience site (TCOB, RSA, and ACHE) completed the site approval form, allowing for participant recruitment through their organizations (see Appendix C). The student investigator recruited participants by posting flyers (see Appendix D), having conversations with caregivers, and through word-of-mouth. Additionally, a recruitment email was sent to parents and caregivers at TCOB with an attached flyer (see Appendix E). The TCOB program director also posted the recruitment flyer to the clinic’s social media platforms.

**Inclusion and Exclusion Criteria.** Inclusion criteria for participation in the pre-survey, educational modules, and post-survey were caregivers of children with known or suspected sensory processing differences, practicing OTP, and OT students. Participants must have been fluent in spoken and written English to provide consent and be 18 years or older. Exclusion criteria were OTP who do not have experience treating pediatric clients.
Survey Design. The mixed-methods survey was distributed via Microsoft Forms. The survey included a consent form with information about the study and inclusion criteria at the beginning of the form. The first survey question housed a link to the consent form; the participant had to read the consent and select either “yes” or “no” to provide consent. If a participant did not check the yes option for consent, the participant was not able to proceed— they were directed to the end of the survey.

The pre-survey had 21 questions, and the post-survey had 19 questions; both were semi-structured and used a combination of fixed and open-ended questions. Each took approximately 15-20 minutes to complete. Basic demographic questions were asked at the beginning of the survey. Some survey questions were designed on a Likert scale, designed to measure participants’ comfort with and understanding of neurodiversity principles, sensory processing, and self-regulation; how important they think the identified topics are to learn about; and if they know where to locate educational resources on the topics (see Appendix D). Five fixed questions used case examples to determine participants’ likelihood of utilizing neurodiversity-affirming strategies in realistic scenarios (see appendix F). Lastly, open-ended questions completed the survey to provide the investigator with information that may not be gleaned from fixed-answer responses (Creswell & Creswell, 2018). While most questions were identical in the pre-and post-survey, there were some that differed. The pre-survey included questions about the participants’ previous use of educational material which was not in the post-survey, and the post-survey asked questions requesting feedback on the educational modules that must have been asked after module completion. The student investigator created the semi-structured survey in collaboration with a neurodivergent adult with expertise in treating children who are neurodiverse. This step ensured the validity and applicability of content before distribution.
Potential participants at TCOB and RSA contacted the student investigator and showed their interest in participating through direct conversation, or they emailed the student investigator expressing interest in the study (this information was on the flyer and in the recruitment email). The student investigator emailed the participant with a link to the pre-survey and educational modules. The online educational modules took approximately 90 minutes to complete, and the participant had two months to complete them at their own pace. The post-survey link was embedded at the end of the educational modules. OT student participants at ACHE were asked to take the pre-survey with consent, review the educational modules, and take the post-course survey outside of the classroom and on their own time prior to attending a presentation by the student investigator on the project. The students were not obligated to participate in the survey process or provide consent for data collection; it was entirely voluntary, and the course instructor did not have access to which students participated in the survey process. However, they attended the presentation since it was an educational requirement for their class.

Data Analysis. Data analysis was completed manually by the student investigator. The proposed study design upheld a mixed-methods approach. Survey questions were analyzed by the type of question. Descriptive statistics described the sample population based on demographics and characteristics and were used to analyze fixed-answer and Likert scale questions. Frequencies and measures of central tendency were used to describe participants' fixed-answer responses. Frequency is when data is counted within categories, whereas central tendency includes mean, median, and mode used to find central data with different techniques (Taylor, 2017).

Investigators coded open-ended questions and assigned them to overarching categories, further examining for thematic content (Strauss & Corbin, 1990). Axial coding is the transition
from the initial process of creating concepts (open coding) to examining the relationship between the concepts within the categories and sub-categories (Strauss & Corbin, 1990). Repeated codes were grouped into themes representing overarching ideas (Creswell & Creswell, 2018). Qualitative themes were integrated with the fixed questions’ responses for data triangulation and validity (Creswell & Creswell, 2018). In addition, the student investigator asked experts in treating neurodiverse clients to review the themes that emerged from the data and provide feedback on the content and validity of the data. The student investigator created tables and figures as necessary, and Microsoft Forms assisted in coding and creating visual representations of the data, such as tables, graphs, charts, etc.

**Confidentiality and Protection.** The pre-and post- survey data collected through Microsoft Forms was stored securely through password protection on the USAHS secure drive. Only the research investigators had access to the data. The data was anonymously submitted, and a numerical identifier was assigned once it was downloaded from Microsoft Forms. Only the research investigators had access to the data on Microsoft Forms. Likewise, only the research investigators had access to the e-mail correspondence with the participants. After completing the pre and post-test surveys, the email correspondence was expunged from the researcher’s laptop. The semi-structured survey will be kept for three years after completion of the study before it is destroyed.

**Evaluation and Revision Phase**

While the product was modified as necessary through informal feedback from practitioners and caregivers throughout the pre-development and development phases, formal assessment of the effectiveness of the educational resource was evaluated through the comparison of pre-and post-survey data analysis from each implementation site. The results and
analysis of the data are discussed in the next chapter. Quantitative and qualitative feedback was used to modify the educational content as necessary after the conclusion of the project.

**Sustainability and Dissemination Phase**

The sustainability and dissemination phase began at the end of the capstone experience and extended beyond the parameters of the experience timeline. Prior to the completion of the research study, the capstone topic and project were presented to entry-level doctoral OT students at ACHE during their pediatric course class time and again to ACHE community partners in the form of a continuing education workshop. The final project and findings from the survey data were disseminated to faculty and OT students through a poster with USAHS. In addition, an application to present at a conference on the topic of neurodiversity, sensory processing differences, self-regulation, and a summary of this project was submitted to both a national and international OT organization. After revision and finalization of the educational modules, the resource will be made continually available to other outpatient pediatric clinics or community organizations, OTP consulting within school systems, and as supplemental material within the pediatric curriculum of OT programs.

**Timeline**

A preliminary needs assessment was first completed by exploring the literature and identifying gaps in service delivery for neurodivergent pediatric clients. The project required continued research, clinical observation, development of survey questions, and a further needs assessment from valued stakeholders before developing, implementing, evaluating, and disseminating the educational modules. Figure 1 provides a visual representation of the project timeline during a 16-week experience. Appendix G provides detailed description of the developmental phases including which learning and project objectives were addressed and when,
the learning activities and outcomes that supplemented the phases, and the time to complete each phase (see Appendix G).

**Figure 1**

*Visual Timeline of 14-Week Capstone Experience*

<table>
<thead>
<tr>
<th>Objective</th>
<th>Weeks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Continued research on neurodiversity and sensory processing differences</td>
<td>1-16</td>
</tr>
<tr>
<td>Observation of neurodiversity-affirming OT intervention</td>
<td>7-10</td>
</tr>
<tr>
<td>Completion of IRB application/addendum</td>
<td>11</td>
</tr>
<tr>
<td>Complete pre-and post-surveys</td>
<td></td>
</tr>
<tr>
<td>Interviews with stakeholders, expanding needs assessment (practitioners &amp; caregivers)</td>
<td>4-10</td>
</tr>
<tr>
<td>Create/develop educational resource</td>
<td>11-12</td>
</tr>
<tr>
<td>Implement resource at TCOB, administer pre-and post-surveys</td>
<td>13-16</td>
</tr>
<tr>
<td>Implement resource at RSA, administer</td>
<td></td>
</tr>
</tbody>
</table>
Conceptual Framework

After a thorough review of the literature, project objectives were developed to address the identified problem. Consequently, phases of project development were identified to achieve positive short-term and long-term outcomes. Figure 2 below demonstrates the conceptual framework upon which this project was designed.

**Figure 2**

*Conceptual Framework for Project Development*
Conclusion and Envisioned Next Steps

The available literature on neurodiversity principles and sensory interventions suggested the need for evolved educational material for caregivers of neurodivergent children. Pediatric therapists’ roles span beyond providing interventions to children to educating caregivers and families to ensure support and carryover in home contexts (Miller et al., 2020). The educational resource aimed to enhance caregiver’s understanding of neurodiversity principles and the implications for addressing sensory processing differences in their neurodivergent children. Utilizing the PEOP model, intended outcomes for neurodivergent children secondary to enhanced caregiver understanding and increasingly supportive environments are increased occupational participation, performance, and well-being (Cole & Tufano, 2020). Following the completion of this project, envisioned next steps include expanding and improving the educational modules to cover neurodiversity principles in other contexts besides addressing self-
regulation, performing a subsequent phase of research on the efficacy and effectiveness of the improved version of the educational modules, utilizing the modules in unexplored settings (i.e. public school systems, different populations of healthcare professionals, etc.), or mentoring another doctoral student that might assume any of the mentioned tasks.
Chapter 4: Results and Analysis

The phases outlined in chapter three guided the educational resource development, implementation, evaluation, revision, and dissemination. This chapter describes the outcomes of the resource development process and evaluative research. The pre- and post-survey mixed-methods data collection aimed to evaluate the educational resource’s effectiveness in educating caregivers on neurodiversity, sensory processing, and self-regulation and to aid in revising the content in response to the feedback for the modules’ continued use.

Results of Developmental Phases

The development of the educational resource consisted of a pre-development, development, and implementation phase. In the first phase, a needs assessment via informal interviews with key stakeholders was conducted. The development phase consisted of completing a Strengths, Weaknesses, Opportunities, and Threats analysis (SWOT), organization of the educational topics, and assembly of the material. The implementation phase required piloting the educational resource at three different sites and pre-and post-surveys to obtain data on its effectiveness.

Pre-Development Phase

Informal interviews were conducted with two caregivers, four speech-language pathologists, three occupational therapy practitioners (OTP), three neurodivergent children and two neurodivergent adults. Clinical observation and field notes documenting neurodiversity-affirming speech and occupational therapy also contributed to this phase. Results from the informal interviews and clinical observations highlighted the need for improved educational resources that more thoroughly discuss sensory processing, self-regulation, and their connection to expressed behavior. Based on this data, it was decided that the concepts would be presented
through a neurodiversity-affirming lens and in language tailored to caregivers without healthcare or therapeutic backgrounds or prior exposure to rehabilitative therapy. Additionally, a priority was made to connect caregivers to additional local and virtual support (extra educational resources, social media accounts, support groups, etc.).

Development Phase

The development phase comprised generating a SWOT analysis, outlining the resource material, and developing the content. The results of this phase are discussed below.

**SWOT Analysis**

**Strengths.** Choosing Google Classroom as the platform for dissemination allowed for the inclusion of multiple forms of media, such as videos, documents, hyperlinks, and photos, and provided participants with easy online access to the content. Additionally, uploading the videos first to YouTube allowed for additional accessibility features, including playback speed modification and closed captioning once embedded into the classroom platform. Partnership with the outpatient pediatric therapy clinic, which operates from a neurodiversity-affirming model, ensured quality content and evidence-based support for the creation of the material. For example, the clinic housed resources that support the neurodiversity model and are recommended to caregivers, including books, academic research, lists of social media accounts, previously curated parent handouts, continuing education courses and webinars, and therapeutic intervention tools and programs.

**Weaknesses.** Though Google Classroom is user-friendly, there are limited ways to manipulate the organization and presentation of materials uploaded to the platform. Due to time constraints, the educational modules were only created in English and not translated into other
languages before implementation with participants. Additionally, participation eligibility was dependent on the inclusion and exclusion criteria defined in the survey methods. Lastly, the content connected neurodiversity to sensory processing and self-regulation from an occupational therapy (OT) foundation without elaborating on other related topics, such as pathological demand avoidance, or topics relevant to speech therapy, such as Gestalt language processing and echolalia. There are other topics related to the neurodiversity model that were worth addressing but simply did not fit within the resource outline.

**Opportunities.** There were opportunities for the dissemination of the modules at additional sites with caregivers that meet the inclusion criteria. Implementing the resource at an early education program like Rise School of Austin (RSA) resulted in more feedback from a diverse group of caregivers. The resource was also be provided to students and faculty at Arkansas Colleges for Health Education (ACHE), who provided feedback from a therapeutic perspective. There were also widespread opportunities for survey recruitment, specifically at the Therapy Center of Buda (TCOB). Since the student investigator was a consistent presence throughout the capstone experience, survey participants were recruited through casual conversation, word-of-mouth among staff and families, email, and even the clinic’s social media platforms. Future opportunities for the resource to further develop include the collaboration from another capstone student to improve or expand upon the educational material, and provision of the resource to other organizations or institutions, such as local therapy clinics, early education programs, or school districts.
**Threats.** Several threats during the implementation of the resource included unforeseen technological difficulties, such as accessibility or formatting issues. Social threats include the widespread belief in behavioral-based models and the presence of applied behavioral analysis (ABA) clinics and associated working professionals in the local area. Lastly, the timeline of the implementation spanned a season of holidays; this resulted in delays in communication and low response rate likely related to participants’ inconsistent routines, increased stress, busy schedules, or lack of interest.

**Resource Content**

The educational resource consisted of three modules: (I) Neurodiversity, (II) Sensory Processing and Self-Regulation, and (III) Neurodiversity-Affirming Interventions. A fourth section providing additional resources divided by topic was also included.

**Module I: Neurodiversity.** The first module exposed the learner to the basics of the neurodiversity movement. Section one housed a case study of a neurodivergent child, which was referenced throughout the remainder of the modules to apply each concept discussed. Section two was designed to introduce the concept of neurodiversity and define basic terms, like *neurodivergent, neurotypical*, and *neurodiverse*. Section three discussed the foundational principles upon which the neurodiversity model was constructed: autonomy, agency, dignity, self-determination, and acceptance. Section four compared the views of the medical model and the Social Model of Disability and introduced *ableism*. Section five discussed the “double empathy problem”, and how it applies to our misunderstanding of neurodivergent populations and their experiences.

**Module II: Sensory Processing and Self-Regulation.** The second module exposed the learner to the basics of the sensory systems, sensory processing, and how sensory experiences
contribute to a person’s ability to self-regulate. Section one was a basic overview of each sensory system and described how every person has unique sensory preferences, needs, and triggers. Section two discussed interoception and alexithymia, connected topics that are inextricably linked to difficulties with self-regulation. Section three briefly discussed monotropism, and how monotropic flows or hyperfixations are a common occurrence for neurodivergent people and are sometimes essential to self-regulating. Section four educated participants on how to identify signs of regulation and dysregulation, which activities can be regulating or dysregulating, and how those might present and be experienced differently for neurodivergent children. Lastly, section five discussed meltdowns, shutdowns, and burnout and how to approach or support an individual who is experiencing any of those states.

**Module III: Neurodiversity-Affirming Interventions.** The third module exposed the learner to a discussion of what is traditionally recommended by therapy, why those recommendations might be harmful to a child’s wellbeing, and how to implement interventions that uphold principles of neurodiversity. Section one referenced the case study and provided an example of what is traditionally recommended by healthcare professionals at the time of diagnosis through a medical model and deficit-based view. Section two discussed behavioral interventions, since they are widely marketed as the “gold-standard” for autistic and neurodivergent children, and the negative effects of those approaches. Section three highlighted the neurodivergent voice, shedding light on the personal experiences that neurodivergent people have and still face. Section four discussed each principle of neurodiversity and how they can be applied to intervention approaches. Lastly, section five provided specific examples of how to implement neurodiversity-affirming principles into sensory-based interventions for neurodivergent children.
Resources. The last section in the educational resource was dedicated to additional resources for caregivers looking for further material on the topics presented in the modules. The resources were categorized into four sections titled “Learning more about neurodiversity”, “Learning more about sensory processing”, “Resources for neurodivergent children and young adults”, and “Advocating for your child”. Each section contained links to books, websites, blogs, and social media pages and groups.

Implementation Phase

The following research questions were proposed before distributing the educational resource and collecting data via pre-and post-surveys:

1.) What are caregivers’ and practitioners’ baseline understanding of neurodiversity principles, sensory processing differences, and self-regulation in neurodivergent children?

2.) After utilizing the educational modules, do caregivers and practitioners have a better understanding of how to implement neurodiversity-affirming sensory interventions that promote self-regulation for neurodivergent children?

The survey design and data analysis were guided by the Sensory Therapies and Research (STAR) frame of reference. STAR prioritizes caregiver concerns and achievement of sensory intervention carry-over outside of the clinical context. Therefore, the data was reflective of participants’ changes in knowledge and confidence in applying the concepts after learning from the educational modules.

Survey Results and Analysis

The educational modules were implemented at three different institutions. Participants were recruited from TCOB, RSA, and ACHE to obtain data from a diverse group of caregivers,
occupational therapy (OT) professionals, and OT students. After initial survey recruitment, 34 individuals expressed interest in participating in the surveys and modules. Participants were given a window of time between February 1, 2023, and March 31, 2023, to complete the surveys and modules at their own pace. At the time of data analysis, 28 (n=29) pre-surveys and 12 (n=12) post-surveys were submitted. The survey submissions were analyzed with descriptive statistics for the demographic and fixed-answer questions and thematic coding for the open-ended questions, then triangulated with a panel of experts.

**Participant Demographics.** The demographic information of the pre- and post-survey participants was analyzed by determining variable frequencies. The data is summarized in Table 1.

**Table 1**

*Demographic Information of Survey Participants*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Caregiver</th>
<th>OTP</th>
<th>OT student</th>
</tr>
</thead>
<tbody>
<tr>
<td>Role</td>
<td>Pre</td>
<td>Post</td>
<td>Pre</td>
</tr>
<tr>
<td>Caregiver</td>
<td>15</td>
<td>9</td>
<td>15</td>
</tr>
<tr>
<td>OTP</td>
<td>5</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>OT student</td>
<td>9</td>
<td>6</td>
<td>9</td>
</tr>
<tr>
<td>Age</td>
<td>21-30</td>
<td>31-40</td>
<td>41-50</td>
</tr>
<tr>
<td>Pre</td>
<td>10</td>
<td>7</td>
<td>6</td>
</tr>
<tr>
<td>Post</td>
<td>5</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Highest level of education</td>
<td>&lt; High school degree</td>
<td>High school degree</td>
<td>Some college</td>
</tr>
<tr>
<td>Pre</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Post</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>If a caregiver: caregivers in household</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>
The largest group of participants identified with the role of “caregiver” in both the pre- and post-surveys, most of which considered their children neurodivergent. The age of the participants was generally evenly distributed, and most participants had a bachelor degree or higher. In the pre-survey, 67% of the OT students who participated in the pre-survey reported interest in practicing pediatric occupational therapy. It should be noted that none of the OTP who submitted the pre-survey submitted the post-survey with their feedback.
Pre- and Post-Survey Quantitative Data. The quantitative data were analyzed with descriptive statistics. This included all fixed-answer or multiple-select answer questions, such as the Likert scale questions and realistic case scenarios. The Likert scale questions in both the pre- and post-surveys were categorized into three sections: (1) confidence in explaining the selected topic; (2) belief in the importance of understanding the selected topic; and (3) knowledge of where to find resources about the selected topic. In the pre-survey Likert scale questions, “agree” and “strongly agree” responses were totaled for each of the four questions in each question category; this helped determine the rate at which participants reported a positive self-rating. The totals in each category of questions were averaged and then compared to determine percentage changes (see Appendix H). On average, only 39.8% of participants reported they were confident in explaining the topics discussed in the modules. However, in summarizing the positive responses for the second section of questions, an average of 96.5% of participants reported that learning about those topics was important for caregivers. An average of 50.8% of participants reported either “agree” or “strongly agree” to indicate that they might know where to locate resources to learn about the module topics. See Figure 1 for a visual representation of the pre-survey data.

In comparing these averages with the results from the post-survey, the first set of Likert scale questions improved to 86.2% of “agree” or “strongly agree” responses, a 46.4% increase, indicating that participants improved their confidence in the ability to explain the topics discussed in the modules. From the second set of questions, 100% of people who engaged in the post-survey considered the topics important to understand. Lastly, an average of 85% of people reported they could now locate additional resources to further their knowledge on each topic, a
34.2% increase from the pre-survey. See Figure 2 for a visual representation of the post-survey data.
Figure 1

*Pre-Survey Likert Scale Responses (n=29)*

- I feel confident in my ability to explain neurodiversity principles.
- I feel confident in my ability to explain sensory processing differences in neurodivergent children.
- I feel confident in my ability to explain self-regulation in neurodivergent children.
- I feel confident in my ability to explain the unique nature of the neurodivergent sensory experience.
- It is important for caregivers to learn about neurodiversity.
- It is important for caregivers to learn about their child’s unique sensory processing needs.
- It is important for caregivers to learn about self-regulation in children.
- It is important for caregivers to learn about the unique neurodivergent sensory experience.
- I know where to find educational resources that describe neurodiversity principles.
- I know where to find educational resources that describe sensory processing differences in...
- I know where to find educational resources that describe self-regulation difficulties in neurodivergent...
- I know where to find educational resources that describe neurodiversity-affirming sensory...
Eight additional Likert scale questions were included only in the post-survey that requested feedback about the educational modules. Figure 3 details the results. Most participants agreed or strongly agreed that the educational modules deepened their understanding of neurodiversity, sensory processing differences, self-regulation, and how to support self-regulation in neurodiversity-affirming ways. Of the participants, 100% agreed that the modules
provided adequate additional resources to help further their knowledge of various topics. Most participants also agreed or strongly agreed that the modules were easy to navigate and visually appealing. Lastly, 92.9% agreed or strongly agreed that they would recommend the modules to caregivers of neurodivergent children.

Figure 3

Post-Survey Likert Scale Responses Pertaining to Modules

The pre-and post-surveys included five case study questions that reflected realistic experiences that caregivers of neurodivergent children might encounter. The purpose of these questions was to determine participants’ likelihood of selecting a response that reflected a neurodiversity-affirming approach. Table 3 depicts the percentage of participants who chose the ideal, neurodiversity-affirming responses out of four to five selections in the pre- and post-
surveys. The percentage of neurodiversity affirming responses increased for each question from the pre-survey to the post-survey.

Table 2

*Case Scenario Questions and Neurodiversity-Affirming Response Rates*

<table>
<thead>
<tr>
<th>Question</th>
<th>Neurodiversity-affirming response rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>If a/my child were to select a toy that is perceived as inappropriate for their age or gender or play with the toy in an unconventional way, I would:</td>
<td>Pre: 78.5%</td>
</tr>
<tr>
<td></td>
<td>Post: 100%</td>
</tr>
<tr>
<td>If a/my child were to become aggressive (such as hitting or kicking others, taking a peer’s toy…) while playing with their peers, I would:</td>
<td>Pre: 58.6%</td>
</tr>
<tr>
<td></td>
<td>Post: 92.8%</td>
</tr>
<tr>
<td>If a/my child were to express extreme dislike or refusal towards brushing their teeth, I would:</td>
<td>Pre: 39.3%</td>
</tr>
<tr>
<td></td>
<td>Post: 71.4%</td>
</tr>
<tr>
<td>If a/my child were to have a meltdown in a public place, I would:</td>
<td>Pre: 40.7%</td>
</tr>
<tr>
<td></td>
<td>Post: 85.7%</td>
</tr>
<tr>
<td>If a/my child were to refuse to eat at the table with the family at dinner time, I would:</td>
<td>Pre: 60.7%</td>
</tr>
<tr>
<td></td>
<td>Post: 78.6%</td>
</tr>
</tbody>
</table>

**Pre- and Post-Survey Qualitative Data.** The responses from the open-ended questions in the pre-and post-survey were collected, transcribed, and organized into similar categories. The student investigator actively became immersed in the data, reading, re-reading, and noting memos. Segments of the texts that were re-occurring were assigned labels to similar segments, and then codes were assigned to the categorized data. Axial coding was the next step; as codes were reviewed, similar codes were combined and examined for similarities. Overarching themes emerged from the data following the axial coding process (Strauss & Corbin, 1990). The student investigator reviewed these steps with the capstone mentor and capstone coordinator; these
EDUCATING CAREGIVERS OF NEURODIVERGENT CHILDREN

processes are referred to as peer-debriefing or triangulating the data (Lysak et al., 2017). Several themes emerged from the study. Three themes related specifically to caregivers’ primary concerns, and they were (1) social skills, (2) safety and self-advocacy, and (3) independence. Three additional themes that related to participants’ perceptions were (1) resources are overwhelming in quality and quantity, (2) resources require input from neurodivergent stakeholders, and (3) resources that validate differences are essential.

Caregivers’ Primary Concerns. Caregivers were asked in the pre-survey what their primary concerns were related to their child’s performance in daily activities. The open-ended responses revealed three themes that fall into this category, including (1) social skills, (2) safety and self-advocacy, and (3) independence. The participants who reported concern about social skills were focused on their child determining socially appropriate behavior and expressing maturity. Participant 7 reported that their child is “not able to determine social situations and the socially appropriate response.” Participant 13 shared that their child is “always choosing seclusion, away from people, with screen time.” These concerns reflect the opinion that their child is missing opportunities to flourish due to their inability to conform to social norms related to communication and behavior.

Another major concern reported by caregivers was safety and self-advocacy. Participants reported understanding their needs, expressing them, having them met can be difficult for neurodivergent children. One participant shared their desire for their child to have adequate support to develop and implement self-advocacy skills. Participant 1 reported, “My primary concern is that he feels supported by us (his parents) and other trusted people in his life… I want him to not feel like he has to conform to social norms.” Another participant provided insight to their parenting styles that support self-advocacy. Participant 8 stated, “I let my teenagers
determine their level of engagement. I have spent their lifetimes teaching them to self-advocate and stay cognizant [of] what makes them feel dysregulated.” These concerns reflect the opinion that neurodivergent children require additional support to develop self-advocacy strategies and learn to determine the safety of situations.

Independence was the third theme related to parent concerns of their children’s occupational performance. Many caregivers were concerned about their child’s ability to complete activities of daily living (ADLs), including personal hygiene and mealtime routines. Participant 17 reported their child is “unusually messy for a child his age. He struggles with basic ADLs that we feel he should already know how to do.” Submissions assigned to this theme revealed that caregivers generally view their child’s development of self-help skills as delayed.

Four participants indicated that their primary concerns changed after engaging with the educational modules. Participant 9 responded “yes” that their views have changed but did not offer an explanation. Participant 2 indicated their primary concerns were reinforced by the modules, stating, “Yes, it has validated my feelings on how to parent rather than what the outside world tells us is right and "normal." Participant 11 reported they had a better understanding of their child’s experiences, and participant 12 recognized that it might be helpful to let their child navigate life more independently and respect their needs. In summary, the modules were moderately effective at influencing the participants' primary concerns about their child’s participation in life’s daily tasks.

**Participants’ Perceptions.** Recurring themes emerged from participant’s overall perceptions of educational resources. Responses from OTP, OT students, and caregivers from the pre-and post-surveys indicated that (1) resources are overwhelming in quality and quantity, (2)
resources require input from neurodivergent stakeholders, and (3) resources that validate differences are essential.

In regard to the first theme, participant 16 said that there is “so much information to choose from. Sifting through the information, [and] trying to decide what applies to my situation,” is difficult. While there is a breadth of information circulating about neurodiversity and sensory-based interventions, people may find it hard to decide what information is worth regard, since not all existing information is applicable to one’s child or a specific situation.

Participants also indicated it is challenging to determine when to trust the information found. Participant 8 reported, “It can be hard to determine validity. You have to really research a person's history and cross reference content/research to verify it, which is honestly really fun for me.” Another concern is that sources of information can easily contradict one another. Participant 2 noted, “Sometimes I don't know which ones are right and wrong. It seems like everything you read you can find another article that contradicts the other.”

Participants appeared to appreciate that the educational modules combated this problem by including very basic information that was well-researched and easy to navigate. Participant 2 said, “I am still not an expert, but I do feel like I understand the basics and learned [where] I can look for more material.” Participant 10 described the modules as “a one-stop-shop for vital information.” Additionally, participants complimented the use of layman’s terms and visuals to teach the material. Participant 5 said, “I enjoyed the colors! Content is well researched. I especially liked how well the info was condensed and delivered for those who have no previous exposure to the materials.”

The second theme spoke to the importance of resources incorporating neurodivergent input. Including neurodivergent people in the creation of material was a theme that emerged
when looking at what participants required from trustworthy educational resources. When asked in the pre-survey what they appreciate about existing educational resources, many participants reported the input from neurodivergent perspectives. Participant 10 said, “The most beneficial types of resources that I have explored have been communicated by those that are neurodivergent.” However, many participants also indicated that there is a severe lack of neurodivergent input in the resources available to them. Participant 13 reported that existing resources “don't have all the answers,” and “[they] would like more information from neurodiverse individuals themselves.” The modules did incorporate neurodivergent perspectives for this reason, and participants complimented that component. Participant 9 reported “I appreciated the perspective of neurodivergent individuals.”

The last theme indicated that effective educational resources that convey the fundamental ideas of the neurodiversity paradigm should validate and celebrate the existence of human difference. Respondents of all types expressed that they hope for children to love and accept themselves for their differences. Another participant finds personal validation from existing neurodiversity-affirming resources. Participant 8 said, “I found permission to exist. I realized I am not alone, and we do not have to conform to social rules/expectations that don't support or nurture us.”

Participants indicated that they felt empowered after engaging with the modules. Participant 1 stated “I want him to grow up to love himself and be a happy human being, [and] just be whomever he wants to be in life.” In the post-survey, responding to the question asking about positive aspects of the modules, participant 11 stated “I don't feel so weird or alone,” and participant 10 also stated “I have much more understanding about what [life] is like for him.” These statements serve as a rejection of the deficit view that is carried by the medical model.
Overall, participants found the modules to be effective in communicating and defending the unique experience of being neurodivergent.

**Sustainability and Dissemination Phase**

Near the end of the capstone experience, the student investigator presented information related to the capstone project topic and process to faculty and students at ACHE. The student investigator completed a three-hour interactive lecture for entry-level doctoral OT students as part of their course curriculum. The presentation summarized neurodiversity, sensory models and approaches, neurodiversity-affirming sensory interventions, and the capstone project and process from the student’s perspective. In addition, the students were asked to participate in self-reflective and goal-writing activities to reinforce the concepts. Also at this site, the student investigator conducted a workshop for ACHE’s community partners as a continuing education opportunity, which discussed the same topics in a 90-minute time frame. The focus of this round of dissemination was on providing students and practitioners with existing sensory-based intervention tools that are neurodiversity-affirming, and how to ensure novel tools are being used in neurodiversity-affirming ways.

After the capstone experience, the student investigator summarized the project and research findings in a poster presentation for the University of St. Augustine for Health Sciences Doctor of Occupational Therapy capstone symposium. The student also submitted abstracts to present a short-course or poster at the following conferences: American Occupational Therapy Association’s Specialty Conference: Children and Youth; European Network of Occupational Therapy in Higher Education’s Annual Meeting; and American Occupational Therapy Association’s National Annual Conference.
Conclusions

The results of the capstone project were revealed through analysis of each phase of the educational modules’ development. Each phase resulted in the accomplishment of a learning or project objective. The modules were thoroughly developed and implemented successfully with a substantial volume of participation. Most notably, the research questions were answered: participants’ baseline understanding of neurodiversity, sensory processing, and self-regulation was moderate at best, and after engaging with the educational modules, participants demonstrated an improved understanding of neurodiversity, sensory processing, and self-regulation. The following chapter will discuss the connection between the results, established literature and theory, and future implications for occupational therapy.
Chapter 5: Discussion and Conclusion

The purpose of this capstone’s program development and evaluative research was to improve upon the existing educational resources for caregivers of neurodivergent children. While a large portion of pediatric occupational therapy (OT) clientele are neurodivergent, there is limited research on evidence-based, neurodiversity-affirming interventions for both occupational therapy practitioners (OTP) and caregivers to implement. This project aimed to close that gap, providing OTP and caregivers alike educational modules that improves awareness of neurodiversity concepts; highlights the connection between sensory processing and self-regulation; disclose the negative effects behavioral interventions might have on children or all neurotypes; and explains how to choose or create neurodiversity-affirming strategies that address dysregulation, which is often the root cause of “challenging” behavior. The pre- and post-surveys accompanying the resource were designed to determine participants’ baseline understanding of such concepts and detect any changes after engaging with the educational modules. The interpretation of the survey results, the impact, strengths, and limitations of the project, the future development of the deliverable, and implications for OT practice are presented in this chapter.

Discussion

Interpretation of Results

The findings from the mixed-methods study indicate that caregivers, OTP, and OT students’ baseline understanding of neurodiversity was limited, but that they desire to improve their knowledge. Comparing the results from the pre-survey to the post-survey, the results support that the educational modules improved their understanding and confidence in explaining neurodiversity principles, sensory processing differences, self-regulation, and the unique
neurodivergent experience. They also provide participants with ample resources to help them further their learning outside the module platform. Overall, the data reflects that the modules positively impacted the potential implementation of neurodiversity-affirming sensory interventions.

The results are consistent with the literature review in that most caregivers and OTP are given resources that support behavioral techniques and will unassumingly utilize them to help their children achieve a perceived high quality of life (Leadbitter et al., 2021). According to the results of this study, however, when exposed to the effects of those techniques and neurodivergent perspectives, they will disagree with their application. When participants were asked how they would respond in realistic situations with a neurodivergent child, they were more likely to select a neurodiversity-affirming strategy and less likely to select a behavior-based solution in the post-survey after learning from the modules. Additionally, caregiver’s primary concerns for their child changed to reflect positive quality of life in about 30% of respondents after learning with the modules. Overall, participants found the educational modules to be accessible, easy to navigate, and beneficial to their understanding and application of neurodiversity-affirming strategies.

The literature also implies that neurodivergent perspectives should be leading the social conversation and research regarding intervention guidelines for neurodivergent children (Dallman et al., 2022). The results of the survey agree with this. Many participants commented on the lack of neurodivergent input in existing resources and reported that the most trustworthy and helpful resources they have utilized have been designed or promoted by autistic or otherwise neurodivergent people. Consulting the population that is being served should be a moral and ethical consideration for the field of OT.
Impact

The future development and application of the educational resource will impact occupational therapy practitioners (OTP) and clients throughout OT practice, academics, and research. The educational modules highlight the importance of integrating neurodiversity principles into existing sensory-based interventions and strategies and challenging behavioral interventions, since they are proven to be trauma-inducing, ableist approaches (Pearson & Rose, 2021). The existing literature and educational resources are saturated with evidence defending behavioral interventions, so it is anticipated that this course can be a valuable tool for OTP, OT students, and caregivers just beginning to navigate identified neurodivergence who want to provide neurodiversity-affirming support for the children in their lives. It is also expected to challenge any ableist beliefs OTP, OT students, and caregivers have internalized and help them recognize the short- and long-term impacts their interventions or parenting strategies had or will have on neurodivergent children.

Strengths and Limitations

Strengths

A major achievement in this capstone project was access to various informative sources during the development process. In addition to completing a thorough literature review, information for the project was drawn from books, blogs, webinars, conference sessions, lectures, podcasts, interactive social media groups, informal interviews with key stakeholders, and observations of neurodiversity-affirming OT, speech therapy, and autism evaluations. The capstone site provided access to training seminars and webinars hosted by active advocates in the neurodiversity movement; a breadth of hard-copy and electronic books; existing handouts, brochures, and pamphlets used for caregiver education; recommendations for social media
groups that include neurodivergent adults who field questions from community members; and opportunities for identifying the application of neurodiversity principles in therapeutic practice, consultation, and education. During the experience, there was a virtual Autism summit and various live webinars that coincided with the development time frame, which largely contributed to the body of knowledge upon which the resource was constructed.

The product was designed with accessibility in mind, considering the topics actually discussed within the resource. The modules were housed on a virtual platform that allowed for simplicity and organization of multimedia sources to accommodate different styles of learning. The video presentations were designed for visual and auditory learners and also uploaded to YouTube to provide users with additional accessibility features, such as altering playback speeds and enabling closed captioning. Each section included a downloadable transcript of the video presentation for learners who prefer to read or have a document to reference back to.

Another strength to consider in the data collection process was having three varied implementation sites for participant recruitment. One site integrated the neurodiversity model into its outpatient pediatric service delivery model, another provided equal access opportunity to developmentally diverse children through an inclusion model, and the last was a university expanding its pediatric curriculum. This increased the volume of initial sampling, resulting in more participant responses, and it ensured recruitment from a highly diverse population of caregivers, OT practitioners, and OT students. Additionally, being a physical presence at the implementation sites during the capstone experience before initiating recruitment likely encouraged participation and commitment from caregivers.
Limitations

Several limitations impacted the outcomes of this project. The first to consider is the limited amount of consultation with autistic adults in the pre-development phase. While the goal was to accumulate neurodivergent perspectives from the local community before creating the resource, only two informal interviews were conducted with neurodivergent adults and three neurodivergent children. With a large portion of the pre-development phase falling within the holiday season, obtaining participants in this stage proved challenging. The most prominent limitation in the development phase of the resource was the lack of funding and time constraint of the capstone project. The development of the modules required the use of free resources, so Google Classroom was the platform selected. With all its positive features, the platform required learners to access the course by signing in with an existing Google account or creating a free one. Learners could not access the course using an email account without a Gmail address. Those with non-Google emails may have chosen not to participate due to the inconvenience of setting up another email account. In addition, the modules needed to be completed and ready to pilot by week ten to provide participants enough time to engage with the pre-survey, the educational modules, and post-survey on their own time.

Another limitation to consider to the trustworthiness of the survey data results is that not all participants who submitted pre-survey responses responded to the post-course survey, which impacted statistical analysis of the survey data. Additionally, “caregiver” was not clearly defined in the inclusion criteria. Investigators did not clearly differentiate that a caregiver must be a parent or guardian of a child, thus allowing those who self-identified as a caregiver, such as early education or pre-school teachers and speech or physical therapists, to participate in the study.
However, because the study was performed secondary to the goal of spreading information about neurodiversity, this limitation is minor in the overall spectrum of the project.

**Caveat Regarding Theoretical Support**

It is vital to note a caveat about the theoretical support used in designing the educational resource. The initial project design and analysis of the survey data was guided by the Sensory Therapies and Research (STAR) frame of reference. However, because the genesis of the project started as a request from an existing therapy practice for a sustainable educational product, the modules were developed consistently with their existing methods of practice and caregiver education. During the pre-development and development phases, it was noted that Dunn’s Model of Sensory Processing was the primary theory utilized by the occupational therapy practitioners at the capstone site; the Sensory Profile 2 was administered to caregivers during OT evaluations and the vocabulary used to discuss sensory processing differences with caregivers was complimentary to that assessment tool. Therefore, the product implemented in the research study explained neurodivergent sensory differences through theoretical underpinnings of Dunn’s Model of Sensory Processing.

There are nuances between the two models that complement each other. Both models refer to sensory modulation as the ability to regulate incoming stimuli and adaptively respond within environments (Cole & Tufano, 2020; Miller et al., 2020). Where Dunn’s Model of Sensory Processing uses the words “active” and “passive” to describe self-regulation strategies (Dunn, 2007), the STAR frame of reference explains behavioral responses to stimuli as “over-responsive” and “under-responsive”, as they relate to pre-determined neurotypical standards (Miller et al, 2020). Both also highlight the importance of matching environments to an individual’s sensory needs to support optimal arousal and regulation (Dunn, 2007; Miller et al.,
Dunn’s model validates individuals’ unique sensory profiles and can help OTP and caregivers understand how to modify environments to support children’s sensory modulation and provide individualized sensory strategies to maintain regulation. However, because the STAR frame of reference further identifies specific patterns of sensory processing differences and prioritizes caregiver education and involvement to promote carry-over into home contexts, it was the primary theory guiding the overall development and assessment of the educational resource.

**Envisioned Next Steps**

In response to the survey data, the existing resource would benefit from added elements throughout the course design. Case studies that discuss neurodivergent individuals in different stages of life. The next version of the resource might include quiz questions to accompany each module, similar to those asked in the pre- and post-surveys, to have learners apply the information to realistic scenarios as they learn the material. There would also be open-ended journal prompts to give learners the opportunity to self-reflect and articulate their growing knowledge. In response to the survey feedback, the resource should integrate several case examples to represent neurodivergent individuals in different stages of life. For example, in addition to the case-study about six-year-old Sam, there would also be case-study connections to a profile about a neurodivergent teenager and a young adult.

Due to the experience time constraints and the goal of implementing the resource before project completion, the modules were limited to neurodiversity, basic sensory processing knowledge, self-regulation, effects of behaviorism approaches, and neurodiversity principles-affirming sensory interventions to address dysregulation. The capstone experience site, Therapy Center of Buda, has expressed interest in expanding the educational resource to discuss other topics relevant to their practice methods in both their occupational and speech therapy services.
In addition to the topics discussed in the modules, the demographic receiving services there would benefit from improved education on masking, pathological demand avoidance, common neurodivergent profiles and co-occurring conditions, and effects of trauma and using trauma-informed approaches. These topics could be a powerful addition to the existing course platform by another capstone student or clinic faculty within the scope of OT practice.

The resource in its current state can be provided to other pediatric outpatient therapy clinics with the desire to integrate the neurodiversity model within their practice and can be used to educate caregivers and staff members through other settings that serve neurodivergent children, such as schools and early education programs, daycare programs, summer camps, and even youth sports and recreation organizations. It is hoped that the resource can also be a beneficial tool in the curriculum for existing speech, occupational, and physical therapy graduate programs, since most program curriculums do not discuss the neurodiversity paradigm, movement, or model and have not yet integrated neurodiversity-affirming intervention strategies into the standard teachings of their pediatric courses.

**Implications for OT Practice**

In OT practice, emphasis is placed on utilizing the most contemporary evidence-based methods to support decision-making and service delivery. However, advocates of the neurodiversity movement argue that oppression, ableism, and research bias in favor of the medical model have always and continue to hinder scholarship from showcasing neurodivergent perspectives and furthering evidence-based methods that uphold neurodiversity principles (Dallman et al., 2022; Pellicano & den Houting, 2022). Implications for OTP are to seek out neurodiversity-affirming research. Until there is a more robust collection of such literature, they should consider sources, even non-scholastic, that speak to the neurodivergent perspective. Peer-
reviewed publications that are deemed “evidence-based” and promoted through graduate-level curriculums allow behavioral models to remain the standard for addressing maladaptive behavior in pediatric populations. However, lived experiences published through virtual platforms, such as blogs and social media, expose the harmful effects of those approaches on neurodivergent individuals and should not be so quickly discounted by OTP.

Additionally, OTP providing services to pediatric clients should always consider the child’s well-being first and foremost. In supporting neurodivergent children’s sensory processing differences, OTP’s role is to educate caregivers on neurodiversity-affirming sensory-based supports and the importance of developing self-determination so that a child can develop sustainable self-regulation skills. OTP should incorporate caregivers into treatment and goal-planning since caregivers are the child’s consistent source of support and can be a powerful agent of change. Neurodiversity-affirming support starts within the home, and when generalized to community contexts should result in increased occupational participation, performance, and well-being for all children.

Conclusion

The purpose of this capstone project was to increase awareness of the neurodiversity model among OTP and caregivers, improve their understanding of children’s sensory and self-regulation needs, and better support those needs in neurodiversity-affirming ways. The Person-Environment-Occupation-Performance (PEOP) and self-determination theory (SDT) were utilized to develop an educational resource and accomplish this goal. The PEOP model supports OTP’s role in crafting optimal person-context fits for improved occupational participation, performance, and well-being. While OTP and caregivers can influence a child’s environment through the lens of this model, the SDT emphasizes the importance of intrinsic motivation in
developing the personal factors represented in the PEOP model. A mixed-methods study was performed to assess caregivers’ baseline understanding of the concepts discussed within the resource and evaluate if it improved their knowledge effectively. The program, although requiring improvements, was shown to be effective based on preliminary implementation and can continue to be utilized to educate relevant populations to improve the health care provision of neurodiverse children.
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https://doi.org/10.1089/aut.2020.0043


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https://sensoryhealth.org/basic/co-morbidity


[https://therapistndc.org/applied-behavior-analysis-aba/](https://therapistndc.org/applied-behavior-analysis-aba/)


https://doi.org/10.1080/09687599.2017.1328157
Appendix A

Field Observation Note Form

Date:

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<th><strong>Objective</strong> - Sensory interventions observed</th>
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Appendix B

Semi-structured Interview Questions

1. Have you heard of the term *neurodiversity*? If so, what does it mean for you?

2. How has your understanding of neurodiversity impacted your practice or approach to treating/raising children?

3. Have you explored any educational resources to learn about neurodiversity principles? In your opinion, what have you found to be beneficial or lacking?

4. Have you explored any educational resources to learn about sensory processing differences? In your opinion, what have you found to be beneficial or lacking?

5. Have you explored any educational resources to learn about self-regulation in neurodivergent children? In your opinion, what have you found to be beneficial or lacking?

6. How have you been able to deepen your understanding of sensory processing differences among neurodivergent populations with existing educational resources?

7. Have you noticed a consistent barrier or problem in educating caregivers about (if you are a healthcare provider) or learning about (if you are a caregiver) neurodiversity and sensory processing differences?

8. In your opinion, how could existing materials be improved to support caregiver education of neurodiversity principles and sensory processing differences?

9. In your opinion, is there an ideal platform to develop a novel resource for educating caregivers (of any neurotype) on these topics?
Appendix C

Site Approval Forms

To Whom It May Concern:

This letter acknowledges that I have reviewed a request by Principle Investigator, Dr. Mary Smith to conduct a research project entitled “Occupational Therapists’ Role in Educating Caregivers on Pediatric Sensory Interventions Guided by Neurodiversity Principles” at the Therapy Center of Buda. I approve this research to be conducted at our facility.

By signing this approval, I am aware that Deanna Bourgeois will be conducting a research project that includes recruitment of participants to collect pre- and post-survey data before and after completion of educational modules about neurodiversity, sensory processing, sensory interventions, and self-regulation.

When the researcher receives approval for his/her research project from the University of St. Augustine for Health Sciences IRB, I agree to provide access for the approved research project. If I have any concerns or need additional information, I will contact the University’s IRB Chair, Dr. Lori Kupczynski, at (903) 330-1559 or LKUPCZYNSKI@USA.EDU

Amy Grant, MS, CCC-SLP
Owner/Clinic Director

Print Name, Credentials

amy@therapycenterofbuda.com

Role at the Facility

(512) 200-5656 M (512) 489-6686 O

Email

Amy Grant

Phone number

11-06-2022

Date
To Whom It May Concern:

This letter acknowledges that I have reviewed a request by Principle Investigator, Dr. Mary Smith to conduct a research project entitled “Occupational Therapists’ Role in Educating Caregivers on Pediatric Sensory Interventions Guided by Neurodiversity Principles” at the Rise School of Austin. I approve this research to be conducted at our facility.

By signing this approval, I am aware that Deanna Bourgeois will be conducting a research project that includes recruitment of participants to collect pre- and post-survey data before and after completion of educational modules about neurodiversity, sensory processing, sensory interventions, and self-regulation.

When the researcher receives approval for his/her research project from the University of St. Augustine for Health Sciences IRB, I agree to provide access for the approved research project. If I have any concerns or need additional information, I will contact the University’s IRB Chair, Dr. Lori Kupczynski, at (903) 330-1559 or LKUPCZYNISKI@USA.EDU.

Hannah Bricker, M.Ed
Print Name, Credentials
hbricker@rischoolaustin.org
Email

Head of School
Role at the Facility
512-891-1682
Phone number

Signature
Date

12/16/2022
IRB COLLABORATION APPROVAL

Project title: Occupational Therapists' Role in Educating Caregivers on Pediatric Sensory Interventions Guided by Neurodiversity Principles
Project ID: ACHE-2022-0126
Principal Investigator: Gina Benavente, DHSc, MPH, OTR
Assistant Professor
School of Occupational Therapy
Arkansas Colleges of Health Education

Dear Dr. Benavente,

This letter is to inform you that the ACHE IRB has reviewed your collaborative application for “Occupational Therapists’ Role in Educating Caregivers on Pediatric Sensory Interventions Guided by Neurodiversity Principles”. This application is for a Scholarship of Teaching and Learning (SOTL) research project where the researchers are evaluating the effectiveness of their education module. There will be a pre-test survey, the intervention of the educational module, and a post-test survey. While this research study does seek to recruit ACHE Occupational Therapy students, participation in the research will be optional and autonomous. The ACHE OT students will receive the education module as part of their curriculum requirements.

The ACHE IRB approves this Collaborative Review Application and will support the research being conducted on ACHE’s campus with IRB approval from the host institution of St. Augustine for Health Sciences, Austin, TX.

We thank you for your application and wish you the best of luck on your research.

LaVona Traywick, PhD
Chair, Institutional Review Board
Professor of Physical Therapy
Arkansas Colleges of Health Education
lavona.traywick@acheedu.org


This letter was administratively prepared by IRB Coordinator Courtney Butler on behalf of the IRB.
Appendix D

Recruitment Flyer

WHAT IS NEURODIVERSITY?

Are you interested in learning more about neurodiversity and how to support sensory processing differences and self-regulation in children?

Are you interested in shaping new educational resources for caregivers?

Participate in pre- and post-surveys based on self-paced educational modules!

Module content includes:
- concepts of neurodiversity
- sensory processing
- self-regulation
- strategies for implementing neurodiversity-affirming sensory interventions.

PARTICIPANTS NEEDED!

Eligibility:
- be a caregiver of a neurodivergent child (ASD, ADHD, OCD, SPD, LDs, etc.) or child with known or suspected sensory processing differences, OR be an occupational therapy practitioner/student
- consent to pre- and post-survey data collection written in English
- access the modules with the appropriate technology (internet, Google account)
- commit time to complete the pre-survey, educational modules, and post-survey

For more information, please contact Deanna Bourgeois at:
- (512) 920-2384
- d.bourgeois@usa.edu

THIS PROJECT HAS BEEN REVIEWED BY THE UNIVERSITY OF ST. AUGUSTINE FOR HEALTH SCIENCES INSTITUTIONAL REVIEW BOARD FOR THE PROTECTION OF HUMAN SUBJECTS. IF YOU HAVE QUESTIONS OR CONCERNS, THOSE QUESTIONS OR CONCERNS SHOULD BE DIRECTED TO THE INSTITUTIONAL IRB CHAIR, DR. LORI KURCZYNSKI, EMAIL: LKURCZYNSKI@USA.EDU, PHONE: 904-300-1559.
Appendix E

Recruitment Email

Dear Prospective Participant,

My name is Deanna Bourgeois, and I am a doctoral student of occupational therapy in the University of St. Augustine for Health Sciences. I am conducting a research study examining the effectiveness of a new educational resource on caregivers’/practitioners’ understanding of neurodiversity, sensory processing, and self-regulation. You are invited to participate in the study if you are a caregiver of a neurodivergent child or child with known or suspected sensory processing differences, a practicing occupational therapy practitioner, or an occupational therapy student.

As a participant, you will gain knowledge of neurodiversity principles as they relate to sensory interventions in addressing children’s dysregulation. If you agree, you are invited to participate in engagement of:

1. Pre-course survey
2. Online educational resource modules
3. Post-course survey.

Each survey is anticipated to take no more than 15-20 minutes, and completion of the educational resource modules will take about 90 minutes. Participants must have internet access, a device to complete the online content, and a free Google account to access the module platform.

Participation in this study is voluntary. Your identity as a participant will remain confidential during and after the study. Only the research investigators will have access to the survey data, and the data will be stored on password-protected applications. Attached is a flyer describing the study with my contact information.

If you have questions or would like to participate, please contact me at (512) 920-2384 or d.bourgeois@usa.edu.

Thank you for your participation,

Deanna Bourgeois, OTS

University of St. Augustine for Health Sciences

Occupational Therapy Program

Doctoral Student

THIS PROJECT HAS BEEN REVIEWED BY THE UNIVERSITY OF ST. AUGUSTINE FOR HEALTH SCIENCES INSTITUTIONAL REVIEW BOARD FOR THE PROTECTION OF HUMAN SUBJECTS.

IF YOU HAVE QUESTIONS OR CONCERNS, THOSE QUESTIONS OR CONCERNS SHOULD BE DIRECTED TO THE INSTITUTIONAL IRB CHAIR, DR. LORI KUPCZYNSKI, EMAIL: LKUPCZYNSKI@USA.EDU, PHONE: 904-330-1559.
Appendix F

Pre- and Post-Surveys

Pre-Survey
Pre-course Survey on Pediatric Sensory Interventions Guided by Neurodivergent Principles

Please review the informed consent on the link below. After reading this consent, answer question 1 with yes or no. If you answer yes, you may proceed with the survey.
https://sway.office.com/8J12LATG9X24YyJR?ref=Link

After agreeing to the consent, please answer the following questions. Some questions will ask you about your background, and other questions will ask your opinion on neurodiversity and how it is applied using case scenarios. Below is a consent form that details our study and your participation. Please read this information carefully and then click yes or no for question one. If you click yes, you will be able to take the survey; if you click no, you will not be able to participate in the study survey or course content. This survey will take you approximately 20 minutes to complete.

THIS PROJECT HAS BEEN REVIEWED BY THE UNIVERSITY OF ST. AUGUSTINE FOR HEALTH SCIENCES INSTITUTIONAL REVIEW BOARD FOR THE PROTECTION OF HUMAN SUBJECTS.

IF YOU HAVE QUESTIONS OR CONCERNS, THOSE QUESTIONS OR CONCERNS SHOULD BE DIRECTED TO THE INSTITUTIONAL IRB CHAIR, DR. LORI KUPCZYNISKI, EMAIL: LKUPCZYNISKI@USA.EDU, PHONE: 904-330-1559.

1.

1. Informed consent: please check yes if you have read the consent form and agree to this study's protocol. Realize that there is information on the consent that informs you that you may leave this study at any time without repercussions and that you may contact the University at the email or phone number above if you have any questions

☐ Yes
☐ No

2. Age

☐ 21-30
☐ 31-40
☐ 41-50
☐ 51-60
☐ 61+
3. Role
   - Caregiver
   - Occupational Therapist
   - Occupational Therapy Student

4. If a caregiver, how many caregivers are in your household?
   - 1
   - 2
   - 3
   - 4 or more

5. If a practicing occupational therapist, how many years have you been practicing?
   - 1-5
   - 6-10
   - 11-15
   - 16-20
   - 21 or more

6. If an occupational therapy student, are you interested in working in pediatrics?
   - Yes
   - No
   - Maybe
   - I don't know
7. Please indicate your highest level of education
   - [ ] Less than high school degree
   - [ ] High school degree
   - [ ] Some college
   - [ ] Associate degree
   - [ ] Bachelor degree
   - [ ] Graduate degree

8. Do you consider yourself neurodivergent?
   - [ ] Yes
   - [ ] No
   - [ ] Maybe
   - [ ] I don't know

9. If you are a caregiver, do you consider your child neurodivergent?
   - [ ] Yes
   - [ ] No
   - [ ] Maybe
   - [ ] I don't know
   - [ ] Not applicable
10. Please select your response to each statement.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly agree</th>
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<tr>
<td>I feel confident in my ability to explain neurodiversity principles.</td>
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<tr>
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<tr>
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<td>It is important for caregivers to learn about neurodiversity.</td>
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<tr>
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<tr>
<td>I know where to find educational resources that describe neurodiversity principles.</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>I know where to find educational resources that describe sensory processing differences in neurodivergent children.</th>
</tr>
</thead>
<tbody>
<tr>
<td>○     ○     ○     ○     ○     ○</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>I know where to find educational resources that describe self-regulation difficulties in neurodivergent children.</th>
</tr>
</thead>
<tbody>
<tr>
<td>○     ○     ○     ○     ○     ○</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>I know where to find educational resources that describe neurodiversity-affirming sensory interventions.</th>
</tr>
</thead>
<tbody>
<tr>
<td>○     ○     ○     ○     ○     ○</td>
</tr>
</tbody>
</table>
11. If a/my child were to select a toy that is perceived as inappropriate for their age or gender or play with the toy in an unconventional way, I would:

- Take the toy(s) and show them how they are supposed to be played with.
- Talk them into playing with another toy that is considered age- or gender-appropriate.
- Place my hands over theirs and demonstrate how to play with the toy(s).
- Wait for them to invite me into their play experience.

12. If a/my child were to become aggressive (such as hitting or kicking others, taking a peer’s toy...) while playing with their peers, I would:

- Put them in time-out.
- Remove them from the play group.
- Encourage them to select an activity (swing, trampoline) that might help them release energy.
- Tell them to play nicely like their peers and make them apologize.

13. If a/my child were to express extreme dislike or refusal towards brushing their teeth, I would:

- Not make them brush their teeth.
- Gradually de-sensitize them to the feeling of bristles on/around their mouth.
- Reward them for each time they brush their teeth longer than 30 seconds.
- Replace the toothbrush with a less traditional option that might be preferred.
- Brush their teeth for them, or force them to.
- Play a song they like while they brush their teeth.
14. If a/my child were to have a meltdown in a public place, I would:

- Leave the place, and teach them to save their big feelings for later when in private.
- Physically remove them from the area to a quieter space.
- Ensure the child is physically safe and let them have their meltdown.
- Ensure the child is physically safe, let them have the meltdown, and provide them unconditional comfort and space to express their feelings.
- Give them a treat or a toy they like to cheer them up.
- Ignore the behavior, and/or walk away.

15. If a/my child were to refuse to eat at the table with the family at dinner time, I would:

- Make them sit with the family until their plate is clean.
- Let them eat at the table with the family with their tablet/TV on.
- Make them sit with the family and eat alone after in a preferred space.
- Let them sit in a preferred space to eat their dinner.

16. If you are a caregiver, what are your primary concerns regarding your child's participation and performance in life's daily tasks?

Enter your answer
17. Where have you been able to locate information about neurodiversity?

☐ Websites

☐ Podcasts

☐ Videos

☐ Social Media (Instagram, FaceBook, TikTok, etc.)

☐ Formal courses, webinars, or conferences

☐ Printable resources (pamphlets, fliers, books, workbooks etc.)

☐ Word-of-mouth/discussion with professionals

☐ Other

18. Where have you been able to locate information about sensory processing?

☐ Websites

☐ Podcasts

☐ Videos

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☐ Other
19. Where have you been able to locate information about self-regulation in neurodivergent children?

- Websites
- Podcasts
- Videos
- Social Media (Instagram, FaceBook, TikTok, etc.)
- Formal courses, webinars, or conferences
- Printable resources (pamphlets, fliers, books, workbooks etc.)
- Word-of-mouth/discussion with professionals
- Other

20. What are the benefits of the resources you have historically used to further your knowledge of neurodiversity?

Enter your answer

21. Are there any downsfalls to the resources you have historically used to further your knowledge of neurodiversity?

Enter your answer
Post-Survey

Post-Course Survey on Pediatric Sensory Interventions Guided by Neurodiversity Principles

Please answer the following questions. Some questions will ask you about your background, and other questions will ask your opinion on neurodiversity and how it is applied using case scenarios. Below is a consent form that details our study and your participation. Please read this information carefully and then click yes or no for question one. If you click yes, you will be able to take the survey; if you click no, you will not be able to participate in the study survey or course content. This survey will take you approximately 20 minutes to complete.

THIS PROJECT HAS BEEN REVIEWED BY THE UNIVERSITY OF ST. AUGUSTINE FOR HEALTH SCIENCES INSTITUTIONAL REVIEW BOARD FOR THE PROTECTION OF HUMAN SUBJECTS.

IF YOU HAVE QUESTIONS OR CONCERNS, THOSE QUESTIONS OR CONCERNS SHOULD BE DIRECTED TO THE INSTITUTIONAL IRB CHAIR, DR. LORI KUPCZYNSKI, EMAIL: LKUPCZYNSKI@USA.EDU, PHONE: 904-330-1559.

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<td>○</td>
<td>○</td>
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<tr>
<td>Statement</td>
<td>Yes</td>
<td>No</td>
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<td>--------------------------------------------------------------------------</td>
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<tr>
<td>The education modules deepened my knowledge of neurodiversity principles.</td>
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<td>-----------------------------</td>
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<td>○   ○   ○   ○   ○   ○</td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

| The education modules deepened my knowledge of sensory processing differences. |
|-------------------------|----------------|
|                         | ○   ○   ○   ○   ○   ○ |

| The education modules deepened my understanding of self-regulation. |
|------------------------|----------------|
|                        | ○   ○   ○   ○   ○   ○ |

<table>
<thead>
<tr>
<th>The education modules deepened my understanding of how to support a child’s self-regulation through neurodiversity-affirming sensory interventions.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<tr>
<td>○   ○   ○   ○   ○   ○   ○</td>
</tr>
<tr>
<td>The educational modules provided references to additional resources that will further my knowledge of neurodiversity.</td>
</tr>
<tr>
<td>---</td>
</tr>
<tr>
<td>The educational modules were easy to navigate.</td>
</tr>
<tr>
<td>The educational modules were visually pleasing.</td>
</tr>
<tr>
<td>I would recommend the educational modules to caregivers of neurodivergent children.</td>
</tr>
</tbody>
</table>
10. If a/my child were to select a toy that is perceived as inappropriate for their age or gender or play with the toy in an unconventional way, I would:

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   - Let them eat at the table with the family with their tablet/TV on.
   - Make them sit with the family and eat alone after in a preferred space.
   - Let them sit in a preferred space to eat their dinner.

15. Have your primary concerns regarding your child’s participation and performance in life’s daily tasks changed since exploring the modules? If so, please explain.

   Enter your answer

16. What did you like about the educational modules?

   Enter your answer

17. What do you feel needs improvement within the educational modules?

   Enter your answer
17. What do you feel needs improvement within the educational modules?

Enter your answer

18. Are there any additional topics or information you would like to have been included in the educational modules?

Enter your answer

19. How will you be likely to locate information about neurodiversity, sensory processing, and/or self-regulation in neurodivergent children in the future? Select all that apply.

- Websites
- Podcasts
- Videos
- Social media (Instagram, FaceBook, TikTok, etc.)
- Formal courses, webinars, or conferences
- Printable resources (pamphlets, fliers, books, workbooks etc.)
- Word-of-mouth/discussion with professionals
- Other
## Appendix G

Phases of Development

<table>
<thead>
<tr>
<th>Phase</th>
<th>Learning (LO)/Project Objective (PO) Addressed</th>
<th>Learning Activities</th>
<th>Learning Outcomes</th>
<th>Timeline for Completion</th>
<th>Estimated Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-development Phase</td>
<td>LO1: Recognize and explore the occupational needs of pediatric, neurodivergent clients with sensory differences through findings in current literature.</td>
<td>-Observe neurodiversity-affirming approaches in clinical practice</td>
<td>-Completed clinical observation forms</td>
<td>Weeks 1-7 of 16-week experience</td>
<td>120</td>
</tr>
<tr>
<td></td>
<td>LO2: Evaluate the neurodiversity paradigm, its essential principles, and its implications for pediatric OT practice.</td>
<td>-Complete IRB proposal and creation of mixed-methods pre-/post-surveys</td>
<td>-Meeting with site supervisors at outpatient clinic discussing the results of the literature review</td>
<td></td>
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<tr>
<td></td>
<td>LO5: Determine the ideal platform to communicate identified issues with the caregivers of neurodivergent children receiving occupational therapy.</td>
<td>-Interview neurodivergent children</td>
<td>-Proposed outline of educational module; modify in collaboration with site supervisors</td>
<td></td>
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<tr>
<td></td>
<td>PO1: Observe sensory-based OT service delivery to neurodivergent persons.</td>
<td>-Interview caregivers of neurodivergent children</td>
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<td></td>
<td>PO2: Interview key stakeholders (autistics/other neurodivergent individuals, their caregivers, practitioners) about their perspectives on the educational resources available and how they might better align with neurodiversity principles.</td>
<td>-Interview practitioners with experience using neurodiversity-affirming sensory interventions with neurodivergent children</td>
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</tr>
<tr>
<td>Development Phase</td>
<td>LO6: Collaborate with stakeholders (professionals, caregivers, neurodivergent adults and children) with expertise on neurodiversity-affirming service delivery to understand and implement appropriate language use, goal-writing, and intervention strategies when serving neurodivergent children.</td>
<td>-Utilize data obtained in pre-development phase to guide development</td>
<td>-Meeting with site supervisors to present SWOT analysis results</td>
<td>Weeks 2-11</td>
<td>200</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-Develop educational resource content and organization</td>
<td>-Meeting regularly with site supervisors to discuss progress of educational resource development</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>-Modify outline of material as needed in response to information from informal interviews and observation</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>-Complete and present SWOT</td>
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</table>
| Implementation Phase | PO3: Develop educational modules for OTP to provide to caregivers that describe sensory processing differences, articulates neurodiversity principles, and provides neurodiversity-affirming sensory interventions that support self-regulation for use in home contexts. | analysis  
- Begin recruiting participants to pilot the resource | - Obtained site agreements from sites for pre-/post-surveys  
- Finalized resource in preparation of implementation |  
| Evaluation and Revision Phase | PO4: Pilot the educational modules with an outpatient pediatric therapy clinic, early education program, and a pediatric course in an OT program. | - Recruit survey/module participants  
- Administer educational modules for caregiver use at TBOC; Administer pre-/post-surveys  
- Administer educational modules for caregiver use at RSA; Administer pre-/post-surveys  
- Administer educational module for use with ACHE OT program; Administer pre-/post-surveys  
- Present on project topics to staff at RSA (in-service) and to OT students at ACHE (guest-lecture) | - Utilized resource with stakeholders at all three sites  
- Obtained feedback from participants at all three sites  
- Assessed strengths and weaknesses informally  
- Experience presenting/disseminating project information | Weeks 11-16  
160  
| LO6: Collaborate with stakeholders (professionals, caregivers, neurodivergent adults and children) with expertise on neurodiverse-affirming service delivery to understand and implement appropriate language use, goal-writing, and intervention strategies when serving neurodivergent children. PO5: Assess modules’ effectiveness via analysis of pre- and post-surveys completed with subjects from each dissemination site. | - Analyze data between pre- and post-surveys to detect change/evaluate effectiveness  
- Interpret and triangulate qualitative and quantitative data  
- Utilize feedback from practitioners/caregivers to modify resource as needed  
- Revise chapters 1-3 as needed  
- Begin drafting chapter 4 (Results) | - Assessed modules’ effectiveness  
- Revised and finalized educational modules for production/dissemination | Weeks 11-16  
80 |
| Sustainability and Dissemination Phase | PO6: Present findings via poster at USAHS OTD capstone symposium. PO7: Apply to present on the topic of neurodiversity and sensory-based caregiver resources at a state or national conference. | -Complete chapters 1-5 of Capstone paper -Complete poster presentation -Apply to present on the topic of neurodiversity, sensory processing differences, self-regulation, and a summary of this project at state or national OT conference. -Mentor student to continue development/expansion of project | -Pass Capstone project; graduate with OTD -Make resource available for public use through any outpatient pediatric clinic, community organizations, occupational therapists consulting within school systems, and as supplemental material within the pediatric curriculum of OT programs. After conclusion of 16-week experience | n/a |
## Appendix H

Likert Scale Positive Response Percentage Increases

<table>
<thead>
<tr>
<th>Category</th>
<th>Question</th>
<th>Pre-Survey</th>
<th>Post-Survey</th>
<th>Percent Change</th>
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<td>Confidence in Explaining</td>
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<td>24.1</td>
<td>60</td>
<td>33.3</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>32.1</td>
<td>6.7</td>
<td>20</td>
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<tr>
<td></td>
<td>3</td>
<td>35.7</td>
<td>66.7</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>14.3</td>
<td>10.7</td>
<td>25 Avg: 39.8%</td>
</tr>
<tr>
<td>Belief in Importance</td>
<td>5</td>
<td>14.3</td>
<td>82.1</td>
<td>96.4</td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>3.4</td>
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<td>7</td>
<td>13.8</td>
<td>82.8</td>
<td>96.6</td>
</tr>
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<td></td>
<td>8</td>
<td>13.8</td>
<td>82.8</td>
<td>96.6 Avg: 96.5</td>
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<tr>
<td>Ability to Locate Resources</td>
<td>9</td>
<td>31</td>
<td>17.2</td>
<td>48.2</td>
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<td></td>
<td>10</td>
<td>34</td>
<td>20.7</td>
<td>55.2</td>
</tr>
<tr>
<td></td>
<td>11</td>
<td>31</td>
<td>20.7</td>
<td>51.7</td>
</tr>
<tr>
<td></td>
<td>12</td>
<td>27.6</td>
<td>20.7</td>
<td>48.3 Avg: 50.8%</td>
</tr>
</tbody>
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