Sensory Processing Challenges in Children

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ABSTRACT

The identification of sensory processing challenges in children is important because the challenges can affect their behavior, learning, and the way they negotiate the world. Symptoms may be difficult to assess and can be found alone or embedded within disorders, such as attention deficit/hyperactivity disorder, autism spectrum disorder, or cognitive disorder. Left unrecognized and untreated, children are often mislabeled, mismanaged, and misunderstood. Herein we provide information regarding the identification and treatment of sensory processing challenges in children and outline the role of the nurse practitioner in helping children and families navigate these unique challenges.

Keywords: identification, nurse practitioner, sensory processing, treatment

BACKGROUND

Sensory processing theory was first described by Dr. A. Jean Ayres in 1972 to identify those children who appeared to have challenges integrating multiple sensory stimuli from visual, auditory, tactile, taste, vestibular, and proprioceptive input.[1] The theory was developed to explain the relationship between deficits in interpreting sensory stimuli from the sensation body and the environment and difficulties with academic or motor learning.[2] Research suggests sensory processing challenges are neurologically based problems stemming from the brain's inability to integrate the sensory input it receives from the sensory systems and turn the input into effective responses. Sensory modulation is the ability to regulate the degree, intensity, and nature of a response to a sensory input[3] and significantly impacts the way a child relates to the world. Sights, smells, sounds, touch, body position, and movement may be affected individually or in combination. Sensory processing challenges have been described as a "disorder,"[1] as well as a "cluster of symptoms associated with other neurodevelopmental disorders."[4]

Pediatric nurses, occupational therapists (OTs), and early intervention teams have been addressing sensory challenges in children for decades. Early intervention teams embraced sensory challenges with the publication of Zero to Three's *Diagnostic Classification of Mental Health and Developmental Disorders of Infancy and Early Childhood, Revised*,[5] which outlined criteria for regulation disorders of sensory processing. Nursing has a long history of intervening with children with sensory challenges (with or without comorbidity) and assisting families in initiating appropriate therapeutic intervention for the child with sensory issues to function optimally in the world. The American Occupational Therapy Association produced a position paper identifying the complex of symptoms called sensory processing disorder in 1982 and supported a full spectrum of approaches and intervention.[6] The Association recommends that clinicians using a sensory integration therapy approach "use clinical reasoning, existing evidence, and outcomes to create a comprehensive, individualized approach for each client, rather than using isolated, specific sensory strategies."

The American Academy of Pediatrics recommends that pediatricians not use sensory processing

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disorder as a diagnosis, "because there are no universally excepted frameworks for diagnosis."[4(p1187)] The Academy states "it remains unclear whether children who present with findings described as sensory processing difficulties have an actual disorder of the sensory pathways of the brain or whether these deficits represent differences associated with other developmental and behavioral disorders."[4(p1187)] The Academy accepts and supports the use of occupational therapy as one of the components of a comprehensive treatment plan for children who exhibit sensory challenges. Sensory processing disorder (SPD) was not included in the *DSM-5* as a separate diagnostic category; however, sensory processing challenges are noted as one of the diagnostic criteria in autism.

Research suggests sensory processing challenges may exist independently, comorbidly, or as part of a larger overarching diagnosis. Among children without disabilities, the prevalence of SPD ranges from 10% to 55%.[7] The range for children with disabilities is estimated at 40%-88%.[8] Children with disabilities, such as autism spectrum disorders,[9,10] attention deficit/hyperactivity disorder,[11,12] and cognitive disorder,[13,14] exhibit significantly more sensory processing issues than children without disabilities. Sensory overresponsivity has also been shown to be correlated with internalizing and externalizing behavior problems and poorly developed adaptive social behaviors.[7] A 2013 study by Owen and colleagues at the University of California, San Francisco, demonstrated, via the use of diffusion tensor imaging, that that children with SPD had "decreased white matter microstructural integrity,"[15(p844)] suggesting that SPD may be biologically based and distinct from other clinical conditions.

Whether or not the constellation of symptoms that present as difficulty processing sensory information is conceptualized as a disorder or embedded in a larger picture of atypical neurodevelopment, the nurse practitioner (NP) can be essential in recognizing the symptoms, providing interpretation of the findings, and developing a treatment plan.

CHARACTERISTICS

A young child's ability or inability to integrate and modulate sensory input can have a profound effect on their comfort in the world. Because children with sensory processing challenges respond inappropriately to certain sensory input and cannot organize a response in an automatic and fluent way, the result may affect the ability to adapt appropriately to daily situations, regulate attention and moods, and function appropriately in a broad arena of social interactions and learning.[10]

Children with processing challenges have difficulty detecting, regulating, interpreting, and responding to sensory input.[16] Symptoms of poor sensory processing appear to evolve over time and vary considerably depending on the sensory system(s) involved. Inconsistency in presentation, with symptoms that vary in depth and breadth, complicates the diagnostic picture and stresses family dynamics. Characteristics of sensory processing challenges may fluctuate within the day, from day to day, and across different demands. Difficulty with sensory modulation may be expressed as underresponsivity, such as failing to react to a fire alarm, or overresponsivity, such as responding to the same alarm with a negative or exaggerated response. A third response is the "sensory seeker," who persistently seeks out increased intensity, frequency, and/or duration of stimuli. This may be expressed by running, jumping, touching people or objects, or making noise.

In infants, symptoms may include problems with eating, sleeping, or playing. If underresponsive, the infant may sleep for long periods or may not demand to eat or, if overresponsive, may reject any new taste or texture placed in the mouth. Infants may be fussy and irritable when held by others, reject cuddling, or cry when new textures touch the skin. Developmental milestones may be delayed.

The toddler struggling with tactile overresponsivity may resist playing with certain toys because "it doesn't feel right." Sensory seekers may repeatedly touch things or hold objects in their hands to obtain more intense feedback. The toddler may overreact to deep touch by responding to a hug with stiffening and pushing away but accept the light touch of a kiss on the head. Moods may change dramatically.

In preschoolers, symptoms may include oversensitivity to touch (cries when hair is brushed), noises (covers ears when school bell sounds), and smells (feels sick at the smell of house-cleaning