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Sensory experiences of children with an autism spectrum disorder and nursing interventions for over stimulation

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SENSORY EXPERIENCES OF CHILDREN WITH AN AUTISM SPECTRUM
DISORDER AND NURSING INTERVENTIONS FOR OVER STIMULATION

by

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A thesis in partial fulfillment of the requirements
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Abstract

Background: Autism spectrum disorders (ASD) are a group of neuro-developmental disorders that are characterized by impaired social interaction, communication, and restricted or repetitive behavior. Children with an ASD also display significant sensory experiences due to sensory disintegration. This integrative review of literature examines the sensory experiences of children with an ASD and determines nursing interventions that will enable them to better cope within the hospital setting. **Method:** an extensive search of databases and current literature on sensory experiences of children with an ASD and interventions that facilitate coping. **Results:** Children with an ASD experience a wide range of sensitivity and defensiveness toward stimuli that differs on an individual basis. There is no current research that reflects nursing interventions for children with an ASD, therefore interventions from other health care occupations were examined and applied to nursing. **Conclusion:** Further research is needed to better understand sensory defensiveness and research is needed in the area of nursing interventions to enable the best nursing care of children with an ASD.

Dedications

To all of the children who have sparked my love and desire to become a pediatric nurse.

To my wonderful family who love, encourage, and support me through everything life brings, I cannot thank you enough for all you have done for me.

To Dr. Julee Waldrop, my amazing Committee Chair. Thank you so much for your support and dedication throughout this whole process, I could not have done it without you!

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Introduction

Autism spectrum disorders (ASD's) are a common set of neurodevelopmental disorders that are gaining attention. ASD's are so prevalent in the United States that the majority of the population either has a family member, or knows of someone diagnosed with an ASD (Inglese & Elder, 2009). Prevalence of ASD in the United States is estimated by the Centers for Disease Control and Prevention (CDC) to affect 1 in every 110 children, and has also shown to be 4 to 5 times more prevalent in boys than in girls (CDC, 2010). These rates demonstrate a calling for pediatric nurses to be familiar with the needs of this population and their families.

Autism as it is known today was first described by Dr. Leo Kanner in 1943 (Inglese & Elder, 2009). His study consisted of 11 children, 8 boys and 3 girls. Dr. Kanner found that many children with this new "syndrome" had been misdiagnosed as feebleminded or schizophrenic because of their "autistic aloneness" (Kanner, 1943). Kanner describes these children as unable to "relate themselves in the ordinary way to people and situations" and with an "extreme autistic aloneness" that "shuts out anything that comes to the child from the outside" (Kanner, 1943). Kanner's observations are still relevant in the clinical manifestations of children with an ASD today. Three developmental deficits that reflect Kanner's observations and are present in children with an autism spectrum disorder are: 1) altered social interaction, 2) an inability to communicate verbally and nonverbally, and 3) repetitive behaviors, including obsessive interests (National Institute of Mental Health, 2009; Inglese & Elder, 2009). Some common characteristics of children with ASD are sensory problems, sleep disturbances, poor communication and interaction, social isolation, and trouble adapting to new situations (Provost et al., 2009, Soulders, et al., 2009, Inglese & Elder, 2009, NIMH, 2009 Schnur, 2005). Since

Kranner's observations of these behaviors, the American Psychiatric Association has created diagnostic criteria (Diagnostic and Statistical Manual-IV, Text Revision (DSM-IV-TR)), which categorizes behaviors to diagnose the different autism spectrum disorders (CDC, 2010).

Several sensory areas in which ASD preschool patients have shown a significant difference from their typically developing counter parts are as follows: behavior changes resulting from sensory processing, touch, oral and auditory processing, as well as vestibular and multisensory processing (Provost, Crowe, Acree, Osbourn, & McClain, 2009). Children with ASD also have altered patterns of sleep when compared to typically developing children of the same age and demographics. Children with ASD have more sleep problems, including sleep disturbances and sleep awakenings, than typically developing children (Soulders et al, 2009). The ability to communicate their needs in a typical back-and-forth conversation is difficult for children with ASD. They can be obsessive concerning one particular interest, knowing only how to speak and communicate on that subject (Inglese & Elder, 2009). The inability to communicate can often lead to social isolation, which many children with ASD prefer, but may cause some to feel depressed (Inglese & Elder, 2009). Often children with ASD have rigid routines that they follow. They have trouble meeting new people and being transferred into new environments (National Institute of Mental Health, 2009; Schnur, 2005). Because of their social impairments, the hospital setting becomes extremely stressful and traumatic to these children. Continuity of care is of utmost importance to facilitate the adjustment of pediatric patients with ASD in the ever changing hospital setting (McCrary, Johnson, Wetsel, & Konz, 2010) and it becomes the responsibility of the nurse to understand the challenges associated with the care of autistic patients (Scarpinato, et al. 2010).

Problem

The difficulty that pediatric patients with an ASD experience when adapting to new situations due to their sensory processing differences demonstrates a need for nurses to find effective methods to help them cope in the hospital setting. Questions that must be addressed in order to fully address the problem are: In what ways do children with autism experience different sensory input? How can nurses approach the care of children with an ASD to minimize distress? What nursing interventions will help reduce sensory overload and anxiety in the hospital setting?

Purpose

This paper examines and identifies the sensory experiences of children with an ASD and the common triggers that over stimulate them. Based on this information, nursing interventions that will help pediatric patients with an ASD reduce anxiety due to over stimulation in the hospital setting are identified. This paper also addresses current methods of care, and how they might be improved. The impact of this integrative research review will help nurses predict, prepare, and provide care for pediatric patients with autism spectrum disorders.

Background

Autism spectrum disorders (ASD) are considered neurodevelopmental disorders that affect social and behavioral functions (CDC, 2010). The brains of children with an ASD process information in different ways than that of typically developing children. ASDs are manifested before the age of three. Characteristic behaviors of a disorder in this spectrum may be present from the early months of life or may not become apparent until the child begins, or does not begin to communicate at the expected time (CDC, 2010).

The Spectrum

The Autism spectrum is made up of three main disorders: Autism, Asperger's disorder, and Pervasive developmental disorder-not otherwise specified (CDC, 2010). These disorders are listed on the spectrum or range of low functioning to high functioning. Individuals with an ASD have a large range of IQ's and savantism. Savants are more common in autism spectrum disorders than they are in any other neurodevelopmental disorder (Howlin 2009).

Autism spectrum also means that the issues (behavioral, social, and sensory) will affect each child differently and can also range from mild to severe. It is important to note that each child's expression of an ASD will be different and individual to his or herself, while still within the diagnosis of the Autism spectrum (NIMH, 2009). Social expressions of the disorder can be avoiding eye contact, dislike of soft touch and cuddling, inability to interpret social cues and facial expressions, and preference for being alone. Repetitive behaviors are also a common

display of the disorder such as rocking, arm flapping, jumping; walk on the tips of their toes, or lining up their toys (NIMH 2009, CDC 2010).

Diagnostic Tools and Criteria

The most common tool used for diagnosing a child with an ASD is the Diagnostic and Statistical Manual of Mental Disorders, the latest version of which is the Diagnostic and Statistical Manual of Mental Disorders-IV-Text Revised (DSM-IV-TR) (American Psychiatric Association, 2011). The DSM-IV-TR is, as defined by the American Psychiatric Association, the standard classification of mental disorders used by mental health professionals in the United States (American Psychiatric Association, 2011). It defines the criteria for the diagnosis of each individual ASD.

There is also the Autism Diagnostic Interview- Revised (ADI-R) that may be used for diagnosis of an autism spectrum disorder. Its components are interview questions for diagnosing an ASD and the criteria are in agreement with the DSM-IV-TR (Lord, 1994). One other reference for diagnosing an ASD is the International Classification of Diseases (ICD-10) which is maintained by the World health Organization (WHO). The ICD-10 requirements for the diagnosis of an ASD are also in agreement with the DSM-IV-TR (WHO, 2007).

The DSM-IV-TR has specific criteria for each of the autism spectrum disorders. Within the criteria a child must have a certain number of symptoms to be diagnosed. For Autism disorder, the diagnosis depends on the child having six or more items from certain categories; these items are certain behaviors such as 1) impaired social interaction through behaviors such as

lack of eye contact, lack of emotional understanding; 2) communications impairments such as a delay in speech, or lack of initiation of conversation; 3) restricted and repetitive behaviors, interests, and activities, for example, hand flapping. These criteria should manifest themselves prior to age three (CDC, 2010).

The criteria for the diagnosis of Asperger's Disorder is similar to Autism, but to a lesser degree. These children will have the impairment in social interaction as autism does, and it will be marked by the same behaviors. There will also be the "restricted, repetitive, and stereotyped patterns of behavior, interests and activities" (CDC 2010) as there is in autism. Due to the mentioned symptoms there will be a marked impairment in social functioning, but there should not be a significant delay in language skills or cognitive development (CDC, 2010).

Pervasive Development Disorder Not Otherwise Specified (PDD-NOS) is a diagnosis where the individual shows abnormalities in language and social skills and is similar to the other ASD's but does not quite fit into any of the specific categories. This diagnosis could be given to children with late onset of symptoms or an atypical presentation of symptoms. However, children with this diagnosis also display the repetitive stereotypical behaviors (CDC, 2010).

Sensory Processing

Most children with an ASD have a different sensory experience than typically developing children. Sensory abnormalities may exist in one or more of the 5 senses (Baranek, David, Poe, Stone, Watson, 2006; Dickie, et al, 2009; Tomchek & Dunn, 2007). Some sensory difficulties are more common among children with an ASD than others. Auditory abnormalities, for example,

are common. High pitch sounds may over stimulate or actually cause a painful sensation to a child's ears. Reactions to sensory inputs are varied, certain pleasant sensory experiences may help the child focus, or may just feel good (Dickie, et al, 2009). Other experiences may be highly unpleasant and the reaction to this sensory experience may not be easily understood by onlookers unfamiliar with autism spectrum disorders. Reactions such as screaming, "melt downs", hiding, covering the ears, and temper tantrums are common. These reactions are the child's way of coping or blocking out that unpleasant sensory input (Baranek, David, Poe, Stone, Watson, 2006; Dickie, et al, 2009; Leekam, et al, 2007; Tomchek & Dunn, 2007). The brain's reactions to sensory input shows that the brains of children with an ASD are not integrating the stimulation as typically developing children do. The difficulty that children with an ASD have with integrating these sensory inputs is part of what creates their want for "sameness" or for daily routines not to change or to change very slowly (Baron-Cohen, et al, 2009).

Since change in the daily routine and new situations stimulate the senses and can cause anxiety, admission to the hospital could produce high anxiety in children with an ASD. Understanding what sensory experiences are perceived as uncomfortable or painful for children with ASD will help nurses minimize stimuli in order to decrease anxiety and help lead to better coping within the hospital setting.

Methods

Inclusion criteria

The method used is an integrative review and synthesis of peer reviewed articles and research studies on nursing interventions and care of pediatric patients with ASD. The articles read and used in this paper have an author that is a nurse, a health care professional that has experience with autism spectrum disorder, or an autism specialist. Since this disorder requires a multidisciplinary approach, research from other disciplines such as speech-language pathology, occupational therapy, physical therapy, psychiatry, and psychology will be reviewed and possibly included. Studies not specific to autism spectrum disorders, but specific to interventions for sensory dysfunction, were reviewed for the potential interventions with this population. The samples were only on pediatric subjects, defined as ages 18 months to 18 years and included both male and female subjects of all races. All studies were peer reviewed, published no earlier than 2000 and performed within the United States, Canada, or Europe.

Exclusion criteria

Studies conducted solely on subjects older than the age of 18, conducted outside of the United States, Canada, or Europe and studies that were published earlier than the year 2000 were excluded from the studies reviewed for this paper.

Databases explored

The data was collected from relevant databases including CINAHL and PubMed. Information was also obtained from Center for Disease Control, National Institutes of Health, and Autism Speaks.

Search Terms used are as follows: autism, nursing, nursing interventions, hospitalization, children, pediatric, autism spectrum, autism spectrum disorders, autistic disorder, sensory, and sensory integration. Other search terms used were autis*, pedi*, nur*, intervent*, and sens*.

A total of 11 studies were used in this integrative review to determine sensory input theories and sensory experiences of children with an autism spectrum disorder. These studies meet all criteria outlined within the methods section.

Findings

The awareness of sensory dysfunction in ASD's is becoming a more important subject of study within the autism spectrum disorders. While this subject is becoming a bigger topic of research, studies done on interventions with this cohort are extremely limited. Studies identifying the sensory dysfunctions, explaining sensory dysfunctions and self coping were reviewed. Studies not specific to autism spectrum disorder, but specific to interventions that are similar to the symptoms described in sensory dysfunction, were also reviewed to recommend as nursing interventions for his population.

Sensory Input Theories

Sensory experiences are different for all children with autism spectrum disorder. Some may have particular sensations that are pleasant for them; most have sensations that are particularly irritating and overloading to them. There are several theories that are used to try to explain these experiences. The theories that are used to try and explain the sensory experiences are hyper-systemizing theory, weak central coherence theory, and the executive dysfunction theory.

Hyper-systemizing is a theory that explains the learning and sensory aspects of ASD's. This theory proposes that people with an ASD categorize things and/or break down an action or problem into different systems. An example would be how children with autism twirl or flap things repeatedly in front of their face. Hyper-systemizing would explain this by saying that individuals with an ASD are breaking down the movement into cause and effect categories so that they know if they move their fingers in a certain way it will cause the exact same movement over and over again. Some of the systems that this theory proposes individuals with an ASD see

are: abstract systems, collectible systems, mechanical systems, motoric systems, natural systems, numerical systems, and social systems. Each item within a system has certain rules it must follow. Individuals with an ASD identify these rules and apply them to things in their surroundings (Baron-Cohen, et al, 2009). A common area that children with an ASD excel in is math and science. Hyper-systemizing would explain this by explaining that the children identify the rules by which a certain math problem follows and then are able to apply it every time that pattern is identified (Baron-Cohen, et al, 2009).

Weak Central Coherence theory (WCC) is another theory used with ASD. This theory is based upon the “global versus detail processing theory” and states that individuals with an ASD look at the details and have great difficulty integrating those details on a global scale. In this light, individuals with autism can explain in great detail many little parts, but fail to recognize the situation in its entirety (Burnette, et al, 2005). The WCC uses this to explain the lack of ability to understand social interactions. WCC can be used to explain sensory issues seen in autism spectrum disorders by rationalizing that, for an individual with autism, the whole of a sensory experience is overwhelming and they must break it down into small pieces in order for it to be processed. Although this theory explains some of the behaviors seen in ASD’s, it lacks consistency in research findings and needs to be further researched to better explain the role of WCC in the functioning of autism (Burnette, et al, 2005).

Executive Dysfunction is a theory that uses high order control processes to explain and guide behavior in an increasingly changing environment. This theory relates to autism spectrum disorders by explaining certain autistic behaviors. These behaviors include repetitive behaviors, need for sameness, and lack of impulse control (Robinson, et al, 2009). These things relate to

the sensory experiences of individuals with autism by rationalizing that their repetitive sensory behaviors are controlled by processes in areas of the frontal, posterior, subcortical and thalamic pathways in the brain (Robinson, et al, 2009).

Tools for measuring sensory input

There are many tools used in the United States to assess sensory functioning. Few of them have been designed specifically for autism spectrum disorders, but most have been found to effectively assess the sensory experiences of children with an ASD. These tools have also been effective in comparing those experiences with typically developing children of the same age and mental intelligence level (Baranek, David, Poe, Stone, Watson, 2006). Three of these sensory assessments are the Sensory Profile, the Diagnostic Interview for Social and Communication Disorders and the Autism Diagnostic Interview. These assessments are questionnaires for caregivers to determine the sensory reaction of children with an ASD to certain stimuli. All of the assessments mentioned assist in determining the severity of the sensory experiences and the triggers that cause the reactions (Baranek, David, Poe, Stone, Watson, 2006; Leekam, et al, 2007; Tomchek & Dunn, 2007).

Auditory

Auditory stimuli is the most commonly reported sensory experience to cause sensory defensiveness in children with an autism spectrum disorder (Baranek, David, Poe, Stone, Watson, 2006, Tomchek & Dunn, 2007). The majority of these experiences are sensory defensive reactions. Sensory defensiveness refers to an abnormal sensory experience to normal

sensory stimuli and is associated with negative reactions to stimuli (Kern, et al., 2006).

Negative auditory reactions are very different for each child. A qualitative study was conducted as a part of the National Institute of Child Health's Sensory Experiences Project, and consisted of interviewing 66 parents of preschool aged children. Of these children, 37 had previously been diagnosed with autism and 29 were typically developing children. Many had a hard time with loud and unexpected noises, and some had sensory defense against noises that were predictable by the parents (Dickie, et al, 2009). Examples of common noises that produced negative reactions were fire alarms, fireworks, other children crying, lots of clapping, and vacuum cleaners running. Another negative sensory experience is toward certain television shows or commercials that the child finds irritating or scary.

Although many children have negative reactions to auditory input, there have also been reports of positive auditory reactions. The study reported that parents of preschooler with autism most often related positive sensory experiences with music. They found that it made their child happy and often included parental involvement of sing-a-longs or hand motions that corresponded to the lyrics (Dickie, et al, 2009). Other positive reports include being intrigued by certain sounds such as a flushing toilet or other "interesting sounds" (Dickie, et al, 2009).

In a comparative study by Tomchek and Dunn, parental report was used to compare the differences between children with and without an autism spectrum disorder. Within this study, the Short Sensory Profile, a variation of the Sensory Profile, was used to measure the sensory experiences of the sample population. The sample consisted of 400 children with an ASD and 1,075 typically developing children. The participants in this study were put into groups of similar ages in order to more accurately determine the differences between participants. Tomchek and

Dunn found an auditory response that is common in children with an ASD is hyporesponsiveness to auditory stimuli (Tomchek & Dunn, 2007). When a child was hyporesponsive to auditory stimuli, they did not respond to verbal stimuli, such as their name being called (Tomchek & Dunn, 2007). This is not well understood and needs further research. The aspect of hyporesponsiveness is related to auditory filtering, which was another area of auditory input that was examined. One study stated that it was as though children with an ASD “tuned out” or “appeared not to hear what you say” even when their hearing had been checked and no deficits in hearing were present (Tomchek & Dunn, 2007). They related this to the auditory processing discrepancy found in ASD’s (Tomchek & Dunn, 2007). This same study also found that many children who displayed auditory processing deficits also had trouble concentrating when background sounds or noises were present.

Visual

Visual stimulation has also been reported in both positive and negative sensory experiences. A qualitative study of 33 children with autism spectrum disorders, 16 of which were low functioning and 17 were high functioning compared three different groups of children. The other groups were 1) 19 children with a developmental delay, 2) 15 children with a language impairment, and 3) typically developing children. Using parental report through the Diagnostic Interview for Social and Communication Disorder it was estimated that 35 percent of high functioning pediatric patients and 56 percent of low functioning pediatric patients with an ASD had an abnormal visual sensory experience (Leekam, et al, 2007).

Negative input was reported as intense reactions to bright lights and sunlight, as well as flashing lights and certain television scenes where the lights flash (Dickie, et al, 2009). Responses to intense visual stimuli were recorded as “bothered by bright lights after others have adapted to the light”, “watches everyone move around the room” and “covers eyes or squints to protect eyes from light” (Tomchek & Dunn, 2007). Other abnormal visual reactions that were commonly cited in ASD’s were lack of eye contact, closely inspecting moving items, and focusing on their peripheral vision. These are thought to be compensatory mechanisms that modulate visual processing in the brain (Tomchek & Dunn, 2007).

Positive visual stimuli have been cited as experiences that bring joy to the individual. Positive experiences include things such as watching bubbles, balloons, fans and other things that fly around (Dickie, et al, 2009).

Tactile

The sense of touch in children with an autism spectrum disorder has not only sensory implications but also relates to some of the core features of the disorder. In Kanner’s early observations he noted what he called the autistic aloneness and an inability to relate to others in social situations (Kanner, 1943). Kanner’s discription is very much associated with touch because affection and comfort are often shown through physical touch. If a child has sensory defensiveness toward certain tactile sensations, it impairs social interactions. One study showed that 60.9 percent of the ASD sample presented with a tactile sensitivity (Tomchek & Dunn, 2007). Tactile stimuli that produced tactile defensiveness were often related to the face, head or certain textures. Face and head sensitivities include having the face touched, getting hair cut and

hygiene related touch like brushing, and having ears cleaned or food wiped off the face (Dickie, et al, 2009). A qualitative study that used the Sensory Experiences Questionnaire for parental report cited other tactile aversions including being held, social touch, and tickling (Baranek, David, Poe, Stone, Watson, 2006).

Positive touch experienced by some children with an ASD has been recorded as personal touch from family including cuddling and back rubs (Dickie, et al, 2009), which has also been shown to cause sensory defensiveness in other children. Positive touch also included sensations such as wind in the face and the feeling of certain substances in the hand (Dickie, et al, 2009). Other positive touch included deep pressure stimulation such as rough play, wrestling, or a big hug (Baranek, David, Poe, Stone, Watson, 2006, Dickie, et al, 2009). One study found that preschoolers with autism were better able to concentrate when wearing a weighted vest, which suggests a benefit of deep pressure (Tomchek & Dunn, 2007).

Overall, tactile defensiveness represents a large portion of sensory defensiveness that is seen in ASD's. Some studies suggest that 55 to 60% of the population with an ASD will display sensory defensiveness to certain tactile input (Leekam, et al, 2007; Tomchek & Dunn, 2007).

Olfactory and Oral

Abnormal olfactory and oral sensory experiences are less commonly reported by parents of children with autism than the other sensory experiences (Dickie, et al, 2009; Leekam, et al, 2007; Tomchek & Dunn, 2007), but it still acutely affects the ASD population. Olfactory

and oral sensory experiences are often combined in research, most likely because of their strong association to one another. A study based on parental report found that 18% of the participants with autism smelled objects and people versus 0% of the typically developing participants (Leekam, et al, 2007). One parental report study found that out of 400 children with an ASD 45.9% avoided certain tastes or food smells, 56.2% were picky about foods regarding textures, 45% would only eat certain temperatures or textures and 52.7% would only eat certain tastes (Tomchek & Dunn, 2007). These percentages show both positive and negative experiences for the olfactory and oral senses. Other experiences reported by parents are gagging, throwing up and having “melt downs” in response to certain foods (Dickie, et al, 2009).

Other non-food related oral experiences have been reported by parents of children with an ASD as related to oral care (Dickie, et al, 2009). A study done on oral care and oral sensitivity based on parental report found that 31.2% of 32 participants from the ASD only group disliked the feeling of a toothbrush in the mouth, and 41% had difficulty with oral care on a daily basis. This study also examined a group of children who had an ASD plus another diagnosis (the ASD plus group), of which the most common secondary diagnosis were language delay/ disorder and developmental delay. Of the 79 children in the ASD plus group, 34% disliked the feeling of a toothbrush and 48% had difficulty with oral care on a daily basis (Stein,et al 2011). This study suggested that these reactions to oral stimulation may place children with an ASD at higher risk for dental caries and periodontal disease (Stein,et al 2011).

Sensory Seeking

Sensory seeking has been well noted throughout literature and is also known as self-stimulation. Self-stimulation is defined by repetitive behaviors and/or motor movements of different kinds such as arm flapping, hair twirling, jumping, rocking, or twirling an object in front of the face that induce sensory stimulation (Liss, et al, 2006; Dickie, et al, 2009). These movements are thought to be soothing to children with an ASD in stressful or over-stimulating situations. A study based on parental report and interviews using several diagnostic tools found that sensory seeking behaviors decreased as the children aged (Liss, et al, 2006). In another study focused on sensory experiences of children with an ASD, parents reported self-stimulatory behaviors as often related to a overwhelming sensory experience. One mother reported that her daughter commonly performed arm flapping after loud noises unsettled her. In the same study another mother of a child with autism described her son's like for deep pressure, such as the pressure received through a hug, saying that she believed it almost provided him a kind of a self-stimulation (Dickie, et al, 2009).

Nursing Interventions

One study that looked at both adults and children with autism spectrum disorders found that higher functioning individuals with autism recommended "sensory rooms" (Leekam, et al, 2007). The sensory rooms should be painted in pleasant, calming colors, with soft, calming music, and soft places to sit (Leekam, et al, 2007). Other studies and parental reports have found that deep pressure provides a calming effect on individuals with an ASD (Baranek,

2002; Tomchek & Dunn, 2007). Taking this into account, acupuncture, or massage would be a great nursing intervention to relax over stimulated patients.

Marge Blanc M.A., CCC-SLP, founder of the Communication Development Center for children with an ASD diagnosis, writes about self-regulation and what individuals involved in these children's care can do to help. Self-regulation is the act of calming oneself before the environment and things within the environment become too much to handle. Blanc states that "neuro-typical" adults do this every day without thinking; through use self-talk to verbally and mentally to remind oneself of organization and reassurance (Blanc, 2009). Blanc also supports the use of sensory rooms, stating that they are vital for self-regulation by giving the child a break from the sensory input that is causing them discomfort (Blanc, 2009). The main point to her column is that anyone involved in the life of a child with an ASD must very closely look for cues given by these children that they are becoming over-stimulated. Verbal cues are often very difficult for children with an ASD because they do not like to verbalize the pain and discomfort they feel because, Blanc states, it "adds insult to injury". Blanc goes on to state that verbal cues may be overlooked because they can take many forms, such as repeating a quote from a movie. The example that she gives for this is one of her students saying "me hurt all over", quoting the children's movie, *A Land Before Time*. Because Blanc's student voiced his discomfort by mimicking a movie character, his attempt to communicate may be overlooked as a "verbal-stim" (Blanc, 2009).

With this knowledge it is very important that nurses look closely for verbal and non-verbal cues (such as covering the ears) in children with an ASD, and do as much as possible to remove the stimulation causing the discomfort. The hospital is an environment with lots of

stimulation and potential sensory overload, and typically does not have a place for children to get away from the stimulation. This makes it even more important to make sure that their hospital room provides a calming atmosphere. Simple “common sense” interventions that nurses could potentially implement include noise reduction for a child that is easily overwhelmed by loud noises, or being aware of lighting with patients who are disturbed by bright lights. Therapeutic touch could also potentially benefit some children with ASD. Because therapeutic touch does not involve physically touching the patient, it is something that could even help patients with tactile sensitivities. The re-distributing of energies that occurs through therapeutic touch has great potential to relieve anxiety in patients with an ASD.

Discussion

Temple Grandin is very well known among the autism community; she has an autism spectrum disorder and has fought through the challenges these disorders present and earned her PhD in agriculture. On her website, Grandin writes: “I have been talking and writing about sensory problems for over 20 years, and am still perplexed by many people who do not acknowledge sensory issues and the pain and discomfort they can cause” (Grandin, 2011). Because the hospital induces stress for a typically developing child, the hospital experience can be extremely stressful to a child with an ASD due to their sensory needs and need for ritual.

Sensory input is so different for individuals with an autism spectrum disorder. Firsthand accounts of sensory experiences describe an implosion of pictures and sensations that are not integrated with one another, which causes distress in these individuals. Carly Fleischman, a young girl is unable to communicate verbally, but found that she can communicate by typing. Carly explains that she takes thousands of pictures when she looks at someone’s face and cited this as the reason she, and other with autism have a hard time looking at others in the face (CNN, 2009). While not all individuals with an autism spectrum disorder have sensory hypersensitivities, many of them do and it is important for nurses to have an awareness of how to best care for these patients.

This integrated review was to examine the sensory experiences of children with an autism spectrum disorder, and to find nursing interventions to help these children cope in the hospital setting. This review did not identify any published research supported nursing interventions specific to autism. Studies on the sensory experiences of children with ASD was also limited and is only recently coming into the light of the media, which will spark further research. Since no

research has been done on nursing interventions, nurses must implement interventions from other occupations and implement those interventions on a child to child basis.

It is important to note that because each child experiences sensory input differently, and has sensory defensiveness toward different stimuli, the nurse must base her care on each individual patient and not generalize nursing care to all patients with ASD. A detailed patient history is highly important because it portrays what sensory experiences are particularly uncomfortable and/or cause anxiety for the patient. It is also important to find out what sensory experiences relax and reduce anxiety in each patient.

Common auditory stimulation in hospitals that could cause sensory defensiveness in a child with an ASD are loud noises such as a slamming door, fire drills, construction, or when housekeeping cleans the floor. It is important to take these things into account and try to place a child with auditory sensitivities in a room that will be farthest away from loud noises. Also, allowing children who are becoming overwhelmed by auditory stimuli to wear noise cancelling headphones or ear plugs can help tremendously (Blanc, 2009). Calming auditory interventions that would produce a positive sensory experience are soft music, or encouraging the parents to sing their child's favorite songs.

Visually, the hospital can be overwhelming because there are so many new faces, and it is a completely different environment with so much to see and look at. By decreasing visual stimuli, nurses can care for the psychosocial aspects of the child, not just the medical needs. Simple nursing interventions such as dimming bright lights, preparing the child before checking pupil reflexes, and not allowing the patient to watch television in the dark can decrease sensory defensiveness. To increase positive visual stimuli it is important to find what the child finds

soothing, such as blowing bubbles for the child to watch or putting a nature show on television with calming scenes.

Tactile interventions have shown to greatly improve the sensory experiences of children with an ASD. The mechanism is not understood, but deep pressure allows for children with an ASD to better concentrate and can reduce the severity of sensory defensiveness (Dickie, et al, 2009). Interventions that fall under this category would be deep pressure massage, providing weighted vests, acupressure, and therapeutic touch. It would also be important to attempt to avoid textures of fabrics or bandages that cause a negative sensory experience to lessen the stress of the hospital stay.

Oral and olfactory experiences may be more difficult to manage in the hospital setting. There is a wide range of smells and tastes in the hospital that are unpleasant to a typically developing child, not just a child with sensory defensiveness. There are certain nursing interventions that cannot be changed, such as administering prescribed medications, but what can be changed is how or with what they are administered. Disguising medications with foods or drinks that the child finds pleasant is a good option for avoiding a negative sensory reaction. Avoiding foods with textures that cause sensory defensiveness is also an important nursing intervention. As with all the other sensory experiences, it is important to determine what smells or tastes cause sensory defensiveness and which ones are pleasant to each individual child.

Self stimulation is not necessarily a bad thing; it is just the way children with an autism spectrum disorder learn to cope with the mass amounts of sensory inputs that they experience. It is important to understand what the actions are and then help the child cope with the stressful

situation. Some self-stimulatory actions that are harmful to the child and should be discouraged and changed through distraction, and providing them with another way to achieve sensory balance instead of harming themselves.

By reducing negative stimuli and increasing calming and positive stimuli, nurses can help their patients have a positive, healing experience in the hospital. There will always be aspects of a hospital visit that are not pleasant, but are necessary for children, such as blood work, and shots, but the key is to minimize the negative experiences by increasing the positive stimuli and allowing the child to maintain as normal a schedule as possible.

Limitations

Limitations to this integrative review consisted of two main areas, 1) lack of available research, and 2) limitations of resources themselves. The topic of sensory issues in children with an ASD have not been the focus of research, most of the research done on autism focuses on the cause of autism or the thought processes of autism. With very little information on the subject, it limits the scope of this integrative review. The second limitation of this review is the limitations of the resources themselves. These studies are limited because most, if not all of the information is parental report. While, at present, parental report is one of the only ways to gain insight into sensory issues of children with autism, it may not always be accurate dependent upon the knowledge level of the parent, and a lack of consistent definitions of sensory experiences.

Recommendations for Nursing: research, education and practice

Autism awareness has recently increased in popularity with awareness being spread through the media. The heightened awareness has begun to increase the demand for research in this area and although research on autism is expanding, the topic of sensory dysfunction in autism spectrum disorders is still extremely limited. Virtually no research exists in regards to nursing, and nursing interventions. Research in all health care areas including nursing, speech therapy, occupational therapy, and physical therapy among others is indicated and encouraged. Research will allow for a better understanding of the existing sensory dysfunctions as well as interventions to lessen the severity and stress of sensory defensiveness. Research in the area of nursing interventions for this population could significantly reduce the stress and anxiety of the hospital experience, and so should be a priority. Sensory defensiveness and sensory dysfunction are very common with the ASD population and should be a large focus of research.

Educating nurses through short in-services on the best modes of care for a population that is very likely to be encountered within the pediatric setting is also recommended. Until further research shows what nursing interventions are most effective, education should be focused on understanding the clinical manifestations of an ASD and symptom management as well as the patient's history.

Nursing practices should be evidence based on the most current and up to date findings. It is the responsibility of each registered nurse to know what the current recommendations are for any population that they are likely to encounter. It can be very challenging to keep up with the most current findings, but it ensures quality care to the patients that nurses have been trained to care for and protect. Since many of the interventions that are being used for the ASD population

have yet to be backed by evidence, it is advisable to involve the parent in the child's plan of care and use what they know works for their child.

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