

2020

Benefits of Nonpharmacological and Pharmacological Treatments in Autistic Children

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<https://doi.org/10.33015/dominican.edu/2019.NURS.ST.04>

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Recommended Citation

Cheng, Amanda, "Benefits of Nonpharmacological and Pharmacological Treatments in Autistic Children" (2020). *Nursing | Senior Theses*. 21.

DOI: <https://doi.org/10.33015/dominican.edu/2019.NURS.ST.04>

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TREATMENTS IN AUTISTIC CHILDREN

Benefits of Nonpharmacological and Pharmacological Treatments in Autistic Children

by

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Fall 2019

BENEFITS OF NONPHARMACOLOGICAL AND PHARMACOLOGICAL TREATMENTS 2 IN AUTISTIC CHILDREN

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Abstract

Autism is a disorder that affects one in 59 children in the United States. The spectrum disorder affects individuals in early childhood and daily functioning. They may display limited spontaneous language and play and have difficulty in processing social messages. The literature review examines the benefits of non-pharmacological and pharmacological interventions in children with autism spectrum disorder (ASD). The proposed study will be guided by the phenomenology theory. Based on this theory, semi-structured interviews will focus on caregiver's perceptions of their children's reactions, needs, and care in healthcare settings. The literature review reveals how certain interventions and treatments have helped this population.

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Introduction

Autism, also known as autism spectrum disorder (ASD), is a developmental disorder characterized by repetitive and characteristic patterns of behavior and difficulties with social communication and interaction. “This may include limited spontaneous language and play, an inability to sustain conversations, and difficulty in processing social messages and cues that promote socially appropriate behaviors” (Pan, 2010). These limitations produce a challenge to children with the disability, parents, and school teachers. Horseback riding and swimming are beneficial in providing a multi-sensory environment that benefits the participant’s behaviors. Sensory integration interventions focus on understanding that “interferences in neurological processing and integration of sensory information disrupt the construction of purposeful behaviors” (Pfeiffer et al. 2011). In one study, data suggested that Ayres’s sensory integration had a positive effect on transitions, socialization, compliance, and general behavior regulation, evident during intervention session and in home environments (Watling et al. 2007). Psychotropic medications are apart of ASD treatment to address aggression, self-injurious behavior, hyperactivity, and other symptoms. However, there are increasing rates of polypharmacy of psychotropic medications with little to no evidence on the effect of these medications on the developing brain.

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Problem Statement

Autism spectrum disorder (ASD), is a developmental disorder characterized by repetitive and characteristic patterns. The term “spectrum” refers to the wide range of symptoms, skills, and levels of disability in functioning that can occur in people with ASD. The symptoms are present from early childhood and affect daily functioning (NINDS, 2019). According to the Centers for Disease Control and Prevention (CDC) (2019), One in 59 children have been identified with ASD. Children diagnosed with ASD often show difficulties in performing their day-to-day performance in self-care, school and play skills. These deficits can lead to social isolation. Early behavioral interventions have been beneficial in helping children develop social and language skills such as physical therapy and art therapy. For example, horseback riding has been effective therapeutic option. Children with ASD improved significantly in areas such as sensory integration and directed attention as well as improved social motivation and sensory sensitivity. (Bass et al, 2009). Pharmacological treatment includes psychotropic medication like antidepressants, stimulants, or neuroleptics. However, the US Food and Drug Administration has indicated only one medication for use in ASD treatment as risperidone (Rosenberg et al, 2009).

Purpose Statement

The objective of the paper is to determine if there are benefits of nonpharmacological and pharmacological treatments provided together for autistic children, and if so, what are they.

Literature Review

The eight articles were found and selected with the keywords: autism, autism children, pharm, pharmacological, nonpharm, nonpharmacological, treatment, medication, therapy,

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children, intervention, occupational therapy, and physical therapy. Articles were found in databases: Google Scholar, Elsevier, and Iceberg. The criteria for choosing the articles to review were: publishing year, treatment, non-treatment, interventions, children, adult, and autism. The research and findings were conducted and founded in between 1997-2016 with the primary diagnosis of the participants having Autism Spectrum Disorder. Refer to Appendix A for literature review table.

The eight articles I have chosen have been categorized into physical activity, sensory integration, and pharmacology. Physical activity is an important part of a healthy lifestyle. Studies have reported positive physical and behavior effects for children with ASDs. Autism can present with symptoms that are categorized into somatosensory disturbance, atypical developmental patterns, mood disturbances, and problems with attention and safety. Another common ASD treatment regimen incorporates pharmacological interventions.

Physical Activity

The article, *Effects of water exercise swimming program on aquatic skills and social behaviors in children with autism spectrum disorders* by Pan (2010) explores the benefits of a 10 week water exercise swimming program (WESP) on aquatic skills and social behaviors of participants with ASD. Physical activity in the aquatic environment enables initiation of independent movements that are hard to accomplish on land due to gravity. The remedial utilization of water exercises or swimming in children with ASDs is believed to foster language development and self-concept.

The individual's aquatic skills and social behavior data were collected three times, the first time at entry to create a baseline, a second time after ten weeks of WESP or regular activity,

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and a third time after another ten weeks (Pan, 2010). With regards to swimming experience, few of the subjects have gone to swimming lessons prior to the study however, all participants had restricted breathing, floating, and stroke abilities dependent on parent reports and first evaluation at study entry. Participants were split into two groups, A and B. Group A received WESP for the first ten weeks, second assessment after the WESP, then regular treatment or activity and third assessment. The arrangement was reversed for subjects in group B. The study lasted 21 weeks, ten weeks WESP, ten weeks control, and one week transition.

“During each WESP session, two children with ASDs were paired with the same instructor each session. Each session was divided into four categories: (A) social and floor warm-up activities, (B) one-to-two small group instruction, (C) whole group games/activities, and (D) cool-down activities” (Pan, 2010). The student to instructor ratio allows for individual instruction, allowing the swim instructor to follow the student’s progression and to adapt to other factors and challenges. WESP also provides games and group activities, allowing the student to become apart of the class while gaining independence.

“Results indicate that WESP improved the aquatic skills in four out of five stages as measured with percentage scores, and decreased the total antisocial behavior problems in children with ASDs” (Pan, 2010). The results yielded from the study were similar to other studies conducted on physical activity -- “children with ASDs showed improvement in scores on water orientation skills, breathing skills, floating skills, stroke skills, and entry and exit skills over an extended period of program” (Pan, 2010). The participants were assessed in balance, speed, agility, power, upper and lower extremity muscle strength, flexibility, and cardio-respiratory endurance, showing an increase in the said increments.

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To maximize potential positive impacts, WESP was carefully designed according to variables such as: child's age, disability, experiences on the water, play skills, and interests and needs of the family (Pan, 2010). WESP resulted in decreased antisocial behavior problems but not increase social competence behaviors. However, many children with autism benefit from watching the positive social interactions of others.

Similarly, another article *The Effect of Therapeutic Horseback Riding on Social Functioning in Children with Autism* Bass et al., (2009) considers the effects of a 12 week therapeutic horseback riding intervention on social functioning in children with autism. Research has suggested animal assisted therapy can influence physiological factors. "Therapeutic horseback riding, a subtype of animal assisted activities, has also been [utilized] to treat populations with both physical and mental disabilities" (Bass et al., 2009). Therapeutic horseback riding is defined as "using horseback riding treatment to improve posture, balance, and mobility while developing a therapeutic bond between the patient and the horse" (Bass et al., 2009). Therapeutic horseback riding stimulates multiple disciplines of functioning and may be appropriate for children with neurological disorder who often present a blend of motor, psychological, and social incapacities.

Bass et al. (2009) used Social Responsiveness Scale (SRS) and Sensory Profile (SP) to assess social functioning pre- and post-intervention. The Social Responsiveness Scale is a 65-item questionnaire that measures the severity of ASD in natural social settings. The five treatment subscales are: social awareness, social cognition, social communication, social motivation, and autistic mannerisms. The Sensory Profile is a 125-item questionnaire that addresses the overall social function and the degree to which children exhibit problems in sensory processing, modulation, and behavioral and emotional responses (Bass et al., 2009).

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Each child in the treatment group received a therapeutic riding session for an hour a week, over the span of 12 weeks. The mounting and dismounting of the horse was aimed at stimulating verbal communication, proprioception, and vestibular processing. Arm circles, trunk twists, and toe touches were designed to condition the individual for the physical demands of horseback riding.

Riding the horse was “designed to stimulate sensory seeking, as well as gross and fine motor domains” (Bass et al., 2009). Instructors led the games that focused on social and communication skills. Examples of the games included “Simon says,” red light/green light, catch and throw, and letter games. The horsemanship segment allowed children to learn to properly groom and care for their horse by learning to identify grooming tools and bathing tools.

Bass et al (2009) verbally and physically reinforced participants with high-fives and hugs upon completion of each exercise. Instructors and volunteers made efforts to maintain eye contact with all participants through the therapy session. “Results revealed that the experimental group significantly increased between pre- and post-testing, [whereas] the control group only marginally increased” (Bass et al., 2009). The study suggest that therapeutic horseback riding may be an efficacious remedial choice for children with autism spectrum disorders. Children in the experimental group improved in critical areas such as sensory integration and directed attention. They also demonstrated improved social motivation, sensory sensitivity, and a decrease in inattention and distractibility (Bass et al., 2009).

Individuals diagnosed with ASDs is widely increasing, therefore it is important to identify recreational activity that may benefit this population. Swimming can enhance a child’s competence and foster an appreciation of proficient movement. “The kinesthetic stimulation provided by horseback riding is unique compared to generic forms of physical therapy” (Bass et

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al., 2009). Overall, both swimming and horseback riding yielded results in improved and desired behavior in independence and directed attention. These studies are the first of its kind and future studies should increase the length and number of sessions to test and further develop more intense forms of physical activity interventions.

Sensory Integration

Pfeiffer et al. (2011) conducted a study called *Effectiveness of Sensory Integration Interventions in Children with Autism Spectrum Disorders: A Pilot Study*. The purpose of this study was to establish a randomized control trial research, identify appropriate outcome measures, and address the effectiveness of sensory integration (SI) intervention in children with ASD (Pfeiffer et al., 2011). Sensory processing disorder (SPD) is quite common among children with ASD; reports in the literature range from 42%-88% (Pfeiffer et al., 2011). Sensory integration disorders often lead people to have extreme responses to what others consider mild stimuli, or to completely shut down and withdraw from society. With sensory processing abnormalities, typical behavior displayed includes stereotypic motor movements, aimless running, aggression, and self-injurious behaviors. These behaviors can interfere with a child's ability to engage or learn in therapeutic activities.

Sensory integration (SI) theory concentrate on the neurological processing of sensory data. SI theory is based on the comprehension that impedances in neurological processing and integration of tactile data disrupts the development of purposeful behaviors. The goals of treatment were to improve attention and cognitive function while decreasing disruptive and repetitive behaviors. Participants were split into two, one group received SI interventions and the other group received fine motor (FM) interventions. "Interventions were provided in the context

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of the summer therapeutics activities program. Activities are to help the nervous system modulate, organize, and integrate information from the environment, resulting in future adaptive responses” (Pfeiffer et al., 2011).

SI-based treatment involves meaningful therapeutic activities distinguished by enhancement of sensation, touch, hearing, proprioceptive, active participation, and adaptive interaction. The interventions are individualized to the needs of each child but include the 10 key therapeutic strategies: arranging the room to entice engagement, ensuring physical safety, presenting sensory opportunities, attaining and maintaining optimal arousal levels, tailoring activities to present the just-right challenge, ensuring that activities are successful, guiding the self-regulation of behavior, creating a playful context, collaborating in activity, and fostering therapeutic alliances (Pfeiffer et al., 2011).

The fine motor treatment group participated in individual sessions with an occupational therapy graduate student. The FM interventions focused three activity areas of constructional, drawing and writing, and FM crafts. According to Pfeiffer et al, (2011) studies, FM interventions were to meet the fidelity criteria of: appropriate supports provided for the child to successfully accomplish the tasks while challenging their fine motor and visual-motor skills, interventions based on therapeutic needs of the child in areas of visual and FM skills, interventions based on the child’s interests to maintain attention and focus on the task, seating and positioning of the child adapted to address their specific size and motor support needs, as well as activities that do not provide full-body proprioceptive, vestibular, or tactile sensory input. During the pretest phase of the study, it was discovered that the participants lacked occupational therapy services within the program due to limited funding.

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Measurement tools were used to further assess in-depth criteria. Sensory processing measure (SPM) is a 4-point Likert-type scale that surveys processing issues, praxis, and social participation, providing a complete picture of the child's sensory processing difficulties at school, home, and in the community. The SPM was used to distinguish the two groups. Social responsiveness scale (SRS) is a 65-item rating scale that measures a child's social impairments such as social awareness, social information processing, capacity for social communication, social anxiety and avoidance, and autistic preoccupations and traits. Results were used to differentiate children with PPD and other diagnostic conditions, showcasing strong discriminant variability (Pfeiffer et al., 2011).

The Quick neurological screening test, 2nd edition (QNST-II), assesses 15 areas of neurological integration that was used to predict scores and results in areas including praxis, hand agility, visual tracking, and motor skills. The goal attainment scaling (GAS) is an objective setting procedure used to determine intervention outcomes explicitly relevant to individuals and their families. The purpose of the tool was to develop goals with the parents to ensure the goals were relevant and appropriate for the child. Vineland adaptive behavior scales, 2nd edition (VABS-2) is "an individually administered measure of adaptive behaviors that assesses the domains of communication, daily living skills, socialization, and motor skills" (Pfeiffer et al., 2011). This measurement tool was used to control validity.

In the study, results demonstrated significant changes in the autistic mannerisms. "Post Intervention differences in social responsiveness between the SI and FM groups [showed that] children in the SI group had significantly fewer autistic mannerisms after interventions" (Pfeiffer et al., 2011). Pfeiffer mentions a study where autistic people who use self-stimulatory behaviors allowed them to process sensory information without sensory overload. But, the evident

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reduction of autistic mannerisms and self-regulatory behaviors may indicate a better ability to process sensory stimuli without the need for regulatory strategies (Pfeiffer et al., 2011). A significant difference was noted in the QNST-2 testing. Participants who received the SI interventions were more competent in completing the standardized test post-test as opposed to their counterpart.

In a study analyzed in 2007, a group of researchers examined the effects of Ayres's sensory integration intervention on the behavior and task engagement of young children with ASD in the research article *Immediate Effect of Ayres's Sensory Integration-Based Occupational Therapy Intervention on Children with Autism Spectrum Disorders*. Watling and Dietz created individualized material for each child's baseline. Some materials used in the treatment phases were swings, rope ladder, small trampoline, scooter board and ramp, balance beams, and toys that challenge bilateral coordination and manipulation (Watling, 2007). Ten activities met the criteria of activity demands matching the cognitive and fine motor skills of the child and the activity having the tendency to evoke attention and engagement. Examples of the activities were puzzles, stickers, beads and strings, and blocks.

The study sessions had three phases, familiarization, baseline, and treatment. The familiarization phase consisted of the child and occupational therapist freely playing with the specified toys. Baseline sessions were like free-play scenarios, similar to a preschool environment. "The therapist continually observed the child's responses to activities and made modifications as needed to offer an appropriate level of challenge that encouraged the development of new skills" (Watling, 2007). All study sessions were videotaped because review footage is the most common method of data analysis for single-subject research. According to

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Watling (2007), an additional benefit to visual inspection is that it increases confidence that observed performance changes are due to intervention.

According to Watling's data, it can be presumed that Ayres's sensory integration had a positive effect on transitions, socialization, compliance, and general behavior regulation; evident during intervention session and in home environments. "The present study found that the rates of undesired behavior immediately after Ayres's sensory integration were similar to those after playing conditions" (Watling, 2007). The children showed improvements in transitions between activities. Findings for engagement were not supportive of Ayres's sensory integration but one participant demonstrated "his highest rates of engagements on the 4 of the last 5 days of study, suggesting that his task engagement improved over time" (Watling, 2007). Studies on Ayres's sensory integration for children with ASD is limited, therefore it is ideal to have well-controlled studies and reliable outcome measures to understand the effectiveness of SI. The study was to record subjective data that may guide future research in the area. The low population sample, short trials, and potential for bias are limitations in both research articles.

Pharmacology

Psychotropic Medication Use Among Children With Autism Spectrum Disorders Enrolled in a National Registry, 2007-2008 by Rosenberg et al. (2009), investigates the trends of prescription medication for children with autism. The US Food and Drug Administration only indicated Risperidone for treatment of autism but many other medications are also prescribed. "Treatment of ASD often includes psychotropic medications to address aggression, self-injurious behavior, hyperactivity, anxiety, sleep problems, and other symptoms common in children with these disorders" (Rosenberg et al., 2009). As stated in previous studies, it is estimated that 30-

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60% of children with ASD use at least one psychotropic medication, predominantly antidepressants, stimulants, or neuroleptics (Rosenberg et al., 2009).

Between April 2007 to October 2018, a total of 5,181 children were sampled and findings concluded that the sample was predominantly male (83%), age 6-11 years old (49%), and often reported psychiatric comorbidities (39% with ≥ 1 comorbidity) (Rosenberg et al., 2009). Older children were more likely to be prescribed medication than younger children. Those who reported no insurance coverage were less likely to be on more than two medications compared to individuals who had private insurance, Medicaid, or a combination of both. According to the results, psychotropic medication use is associated with geographic characteristics. “Increased medication use in poorer areas may reflect that these children have less access to behavioral and education supports and thus use more pharmaceutical interventions” (Rosenberg et al., 2009). This greatly reflects the access to specialty health care and inconsistent guidelines for pharmaceutical management of ASD.

Similarly, *Psychotropic Medication Use and Polypharmacy in Children With Autism Spectrum Disorders* by Spencer et al., (2013) examines the rates and predictors of psychotropic use and multiclass polypharmacy among commercially insured children with ASD. Research shows increasing rates of psychotropic uses and polypharmacy in children overall and in children with ASD. General apprehension about such medications are the absence of proof reporting the safe or adequacy of psychotropic treatment during adolescence. Developing brains and bodies may be vulnerable to organic impacts.

Data was gathered through a large database associated with a large US commercial health plan that discovered “a total of 33, 565 children with ASD who had at least 6 months of months of continuous medical, pharmacy, and behavioral health care coverage between January 2001

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and December 2009 were identified” (Spencer et al., 2013). Household income, ethnicity, age, geographic location, co-occurring conditions, and having had a specialist visit were seen as altogether significantly related to psychotropic use and polypharmacy. Spencer et al. (2013) identified that common class combinations were antidepressants and ADD medications (38% of subjects), antipsychotic and ADD medications (28%), antipsychotics and antidepressants (20%), and antipsychotic, antidepressant, and ADD medications (18%). A large proportion of children who have autism have comorbidities like epilepsy and seizures, ADD, anxiety, depression, and bipolar disorder. This population are psychotropic users and more than half are users of polypharmacy. Results showed that common combinations of classes were antidepressants and ADD medications, antipsychotics and ADD medications, antipsychotics and antidepressants, and all 3-- antipsychotics, antidepressants, and ADD medications (Spencer et al., 2013). Such statistics are beneficial in understanding treatments for children and potentially older children with ASD.

In *Risperidone and Explosive Aggressive Autism* by Horrigan and Barnhill (1997) the objective was to further understand Risperidone and its effect in a broader age range of severe explosive autistic individuals. “Risperidone is a benzisoxazole with potent antipsychotic properties” (Horrigan, 1997). The drug reduced extrapyramidal side effects with a quick onset of action. 11 male patients age 6 to 34 years old participating in the study. Initial evaluation concluded of a physical examination, neurological examination, and blood work as needed. Risperidone was started at 0.5 mg orally, once daily at bedtime as disturbed sleep hygiene was exacerbating, and aggravating factor found in eight of the patients (Horrigan, 1997). Doses were titrated higher, gauged by adult caretaker reports in increments of 0.25-0.5 mg every 5 to 7 days.

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Subjects had follow-up visits to further monitor side effects such as changes in appetite, somatic complaints, mood changes, quality of social interactions, compulsive or stereotypical behaviors, and changes in the pattern of self-directed and externally directed aggression. Results showed major clinical improvement in each patient as early as the first 24 hours after risperidone was administered. “Aggression (hitting, kicking, biting), self-injury (head banging, self-biting), explosivity (sudden, intense tantrums occurring with little or no provocation), overactivity (persistently elevated levels of motor activity), and poor sleep hygiene (difficulty falling asleep, difficulty staying asleep) diminished most significantly” (Horrigan, 1997). None of the patients reported dizziness or other side effect that may propose orthostatic hypotension, changes in pulse or blood pressure. The precise dose of risperidone was achieved for each subject after a 4 week period. It was noted that temper outbursts were the strongest and most consistent drop in all participants. Overall, the study was indicative that risperidone therapy was most effective in the subjects of explosive, autistic males. However, more studies are to be done to study more serious side effects such as neuroleptic malignant syndrome and tardive dyskinesia.

Intranasal oxytocin versus placebo in the treatment of adults with autism spectrum disorders: a randomized controlled trial by Anagnostou, Soorya, Chaplin, Bartz, Halpern, Wasserman, Wang, Peta, Tanel, Kushki, Hollander (2016), the objective is to study the safety and therapeutic effects of intranasal oxytocin versus placebo in adults with ASD. Oxytocin has a unique role in influence social behaviors and has potential for generating animal models with behavior deficits relevant to ASD (Anagnostou, 2016). Evidence has shown that individuals with ASD have a reduction of oxytocin mRNA in the temporal cortex which is associated with hypermethylation. “Oxytocin has been shown to play a role in social recognition, memory, and attachment, as well as in stereotyped behaviors [like] exaggerated grooming” (Anagnostou, 2016).

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The current study is following another study where intranasal oxytocin (IN-OXT) promoted trust and prosocial behavior in humans. “Participants receiving oxytocin showed reduced amygdala activation to social stimuli more than nonsocial kinds of stimuli, further suggesting that oxytocin is mediating human social behavior” (Anagnostou, 2016).

The randomized, double-blind, placebo-controlled, parallel design trial study was quite selective wherein participants were to be 18 to 60 years old and on stable pharmacological or non pharmacological treatments for at least 3 months. Exclusion criteria included bipolar disorder, psychosis, post-traumatic stress disorder, schizophrenia, respiratory, renal, hepatic or gastrointestinal disease. Sexually active women were to be on two barriers of contraceptives and no hormonal birth control. Oxytocin and placebo were administered via nasal spray twice-daily for six weeks. Anagnostou et al., assessed the participants every two weeks for improvement ratings, vital signs, and measures of repetitive behaviors. Subjects kept a medication diary to document when they took the medication. “The diary was reviewed at every visit and the study clinician and participant problem-solved together in the case of missed doses to improve compliance” (Anagnostou, 2016).

In conclusion to the study, oxytocin was well tolerated with no serious side effects reported. In the oxytocin group, two have reported increased irritability of mild to moderate severity and two others have reported allergy symptoms. In the placebo group, there were reports of mild cough, depressed mood, and fatigue (Anagnostou, 2016). Although there were no significant differences found between blood work in oxytocin and placebo, it is the first study to trial daily administration of IN-OXT in autistic individuals. Risperidone is a common pharmacological intervention yet side effects may be severe. Other treatments such as oxytocin is a newer study that may employ as an alternative.

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Physical activity is beneficial to everyone. Swimming exercises the whole body without putting excessive stress or tension on specific body parts. Participants responded well to the intervention and demonstrated independence and skills. Therapeutic horseback riding allowed the subjects to better enhance their sensory integration and directed attention. Sensory processing disorder is a common symptoms of autism where individuals may display extreme responses and behaviors. Ayres's sensory integration interventions aims were to improve attention and cognitive function. Data has shown a positive effect on socialization, compliance and regulation of general behavior. Pharmacological treatment is common in many children and often treats symptoms non pharmacological therapy cannot help. Risperidone is a commonly prescribed medication that has benefited those with explosive autism and other unwanted symptoms. Trial run of oxytocin has benefitted some individuals as well.

Autism is a disease that has affected many. The wide broad spectrum of symptoms arrayment makes treatment difficult and highly individualized in both pharmacologic and nonpharmacologic interventions. Some gaps identified in the current research are population sizes, short duration of testing, and limited research on pharmacological trends. Population sizes ranged from 12 to 34 participants lasting for a few months. More research is to be done on a grand scale. Another unexplored topic is the adaptability to hospitals. Hospitals provide an unpredictable timeline which may create frustration among people with ASD. There are often symptoms that non-pharmacological interventions cannot prevent or fix. Pharmacological interventions and medication are a necessary aid in other symptomatic management.

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Research Proposal

What are the caregiver's perceptions of their children's reactions, needs, and care in healthcare settings? Studies have shown the benefits of physical activity, sensory integration, and pharmacology in the treatment of children with ASD. Physical activity yielded positive attitude changes as well as learned skills in swimming and horseback riding. Sensory integration interventions demonstrated fewer autistic mannerisms as well as decreased undesired behaviors such as: stereotypical motor movements, aimless running, aggression, and self-injurious behaviors. Due to the wide array of symptoms, each child has an individualized care and set of interventions. It has been noted that medication is given to treat symptoms that are unmanageable by non-pharmaceutical interventions. "Treatment of ASD often includes psychotropic medications to address aggression, self-injurious behavior, hyperactivity, anxiety, sleep problems, and other symptoms common in children with these disorders" (Rosenberg et al., 2009). These interventions benefit children in the outside world. However, there is limited research in understanding children with ASD in the healthcare setting.

Theoretical Framework

The theoretical framework used to guide this research was phenomenology. This theory describes the lived experience with the aim of finding the meaning in experiences and making sense of it (Schmidt & Brown, 2012). This study will provide insight from caregivers and children with ASD of their lived experiences in hospitals and healthcare settings. Caregivers' perceptions were studied to distinguish and depict themes and trends and to discover approaches to help children have an easy transition in such experiences. The phenomenology theory design will obtain data through semi-structured interviews with caregivers. Through the interviews, data

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will be collected and analyzed, resulting in theme descriptions. The primary research aim is to further understand caregiver perceptions of their children with ASD and their visits with healthcare providers.

Ethical Considerations

The five ethical principles I will abide to are: minimizing risk of harm, obtaining informed consent, protecting anonymity and confidentiality, avoiding deceptive practices, and providing the right to withdraw (Laerd Dissertation, 2012). I will obtain consent for the audio recording of the interviews. I will assign a study ID to each participant and no private information will be revealed. Participants confidentiality will be maintained. Recruitment, data collection, and ethical considerations will begin after the study was approved by the Internal Review Board of the Dominican University of California.

Potential ethical issues include: informed consent, beneficence, respect for anonymity and confidentiality. Informed consent is to ensure the patient's right to autonomy is protected. "It is essential to describe any physical harm or discomfort, any invasion of privacy and any threat to dignity as well as how the subjects will be compensated in that case" (Burns, 2015). In interviews, participants share intimate details that may open old wounds. If risks outweigh the benefits, the study will be revised (Burns, 2015). Anonymity protects the subject's identity and cannot be linked with the personal responses given while confidentiality allows individuals to give and withhold information as they choose.

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Research Method

The qualitative study will use a design based in phenomenology to describe the lived experiences of caregivers of children with ASD. The standardized open-ended interview is a structured study design where participants are asked identical questions with open-ended responses. The open-ended questions allow participants to contribute detailed information. The sample population will represent caregivers of children with autism spectrum disorder.

The projected sample size of this study will include six participants, including family members and caregivers. Participants will be recruited through social media, schools, or pediatric hospitals, and autism associated organizations where participants are eligible to request for more information. Once informed consent is obtained, demographic information will be collected. The semi-structured interviews will be voice recorded.

Research focusing on the experiences of individuals with autism and their families is on the rise. This is due to the growing attention on individuals with ASD and recognizing the impact of ASD on families. In *Qualitative research with families living with autism spectrum disorder: Recommendations for conducting semistructured interviews* by Cridland et al. (2015), provides insight and experiences of a research team conducting a range of qualitative methods, particularly semi structured interviews. "Semi-structured interviews involve in-depth conversations between the researcher and interviewee, which have an overall purpose prompted by the research aims, but are strongly guided by the interviewee's perceptions, opinions, and experiences" (Cridland et al., 2015). Analysis and interpretation of qualitative research can be influenced by other variables such as preparation, data collection, transcribing, and reading of transcripts. I will use content analysis to search for repeated phrases or words and from the words, themes will be developed.

Conclusion

Autism is a disorder that affects individuals differently. The spectrum of symptoms vary with very individualized care and treatment. The literature review suggests that there are many interventions involved in treating ASD. Non-pharmacological and pharmacological interventions intermingle and treat other symptoms that other interventions cannot. A common and successful intercession was physical activity. Although exercises varied, sensory integration and directed attention improved. To combat those with sensory processing disorders, sensory integration interventions were implemented and displayed enhancement in attention and cognitive function. Pharmacological studies identified that a majority of children with ASD use at least one psychotropic medication to combat symptoms of aggression, self-injury, explosivity, overactivity, and poor sleep hygiene. However,

Implications for Nursing Practice

In order to properly care for children with ASD, the nurse and health care team must understand non-pharmaceutical and pharmaceutical interventions that have been implemented into care. This literature review suggests that there are many ways to treat temperaments. As nurses, the people they encounter at the hospital may range from individuals with disabilities to disorders and diseases. Children and adults alike have social and communication difficulties that may make it more difficult to communicate and have their healthcare needs met.

The focus is to help children in the acute setting. Caring for individuals with ASD has come a long way. Identifying people with ASD has played a role in improving their overall quality of life. Staff who conduct clinical assessment should look for indicators of ASD through the patient's social interactions, communication, and behaviors as well as responding to the

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concerns raised by parents. Nurses can play a role in reducing exacerbations of unwanted behaviors, education to family members, caregivers, and peers. This can be especially important for children with autism who are admitted to the hospital for acute exacerbations.

The literature review displayed non-pharmacological and pharmacological interventions currently available for children with ASD. The literature suggests that each intervention is effective but durations of the study can be elongated as well as an increase in sample size and follow-ups. It is still unknown as to what long-term effects these interventions, both non-pharmacological and pharmacological may have on the children and their growing brain. ASD continues to present obstacles in the daily lives of children and their families. Research is needed to further understand better coping mechanisms and styles that may be implemented on a global scale.

References

- Anagnostou, E., Soorya, L., Chaplin, W., Bartz, J., Halpern, D., Wasserman, S., ... Hollander, E. (2012). Intranasal oxytocin versus placebo in the treatment of adults with autism spectrum disorders: a randomized controlled trial. *Molecular Autism*, 3(1), 16–24. <https://doi.org/10.1186/2040-2392-3-16>
- Autism Spectrum Disorder Fact Sheet (2019, August 13). In *National Institute of Neurological Disorders and Stroke*. Retrieved From <https://www.ninds.nih.gov/Disorders/Patient-Caregiver-Education/Fact-Sheets/Autism-Spectrum-Disorder-Fact-Sheet>
- Bass MM, Duchowny CA, & Llabre MM. (2009). The effect of therapeutic horseback riding on social functioning in children with autism. *Journal of Autism & Developmental Disorders*, 39(9), 1261–1267. <https://doi.org/10.1007/s10803-009-0734-3>
- Baron-Cohen, S. (2009), Autism: The Empathizing–Systemizing (E-S) Theory. *Annals of the New York Academy of Sciences*, 1156: 68-80. doi:10.1111/j.1749-6632.2009.04467.x
- Burns, N., Grove, S., & Gray, J. (2015). *Understanding Nursing Research: Building an Evidence-Based Practice* (6th ed.). St. Louis, MO: Elsevier.
- Centers for Disease Control and Prevention (2019, September 3). In *Data & Statistics on Autism Spectrum Disorder*. Retrieved from <https://www.cdc.gov/ncbddd/autism/data.html>
- Cridland, E. K., Jones, S. C., Caputi, P. & Magee, C. A. (2015). Qualitative research with families living with autism spectrum disorder: Recommendations for conducting semistructured interviews. *Journal of Intellectual and Developmental Disability*, 40 (1), 78-91.
- Horrigan JP, & Barnhill LJ. (1997). Risperidone and explosive aggressive autism. *Journal of Autism & Developmental Disorders*, 27(3), 313–323. Retrieved from

BENEFITS OF NONPHARMACOLOGICAL AND PHARMACOLOGICAL TREATMENTS²⁶
IN AUTISTIC CHILDREN

<https://search.ebscohost.com/login.aspx?direct=true&db=ccm&AN=105822413&site=eds-live>

Principles of research ethics (2012). In *Laerd Dissertation*. Retrieved from

<http://dissertation.laerd.com/principles-of-research-ethics.php>

Pan, C.-Y. (2010). Effects of Water Exercise Swimming Program on Aquatic Skills and Social Behaviors in Children with Autism

Spectrum Disorders. *Autism: The International Journal of Research and Practice*, 14(1), 9–28.

Retrieved from

<https://search.ebscohost.com/login.aspx?direct=true&db=eric&AN=EJ872183&site=eds-live>

Pfeiffer, B. A., Koenig, K., Kinnealey, M., Sheppard, M., & Henderson, L. (2011). Effectiveness of sensory integration interventions in children with autism spectrum disorders: a pilot study. *American Journal of Occupational Therapy*, 65(1), 76–85.

<https://doi.org/10.5014/ajot.2011.09205>

Rosenberg RE, Mandell DS, Farmer JE, Law JK, Marvin AR, & Law PA. (2010). Psychotropic medication use among children with autism spectrum disorders enrolled in a National Registry, 2007-2008. *Journal of Autism & Developmental Disorders*, 40(3), 342–

351. <https://doi.org/10.1007/s10803-009-0878-1>

Schmidt, N. A., & Brown, J. M. (Eds.). (2012). Evidence-based practice for nurses: Appraisal and application of research (2nd ed.). Sudbury, MA: Jones and Bartlett.

Spencer, D., Marshall, J., Post, B., Kulakodlu, M., Newschaffer, C., Dennen, T., Azocar, F., Jain, A. (2013, October 21). Psychotropic Medication Use and Polypharmacy in Children With Autism Spectrum Disorders. *Pediatrics*. <https://doi.org/10.1542/peds.2012-3774>

BENEFITS OF NONPHARMACOLOGICAL AND PHARMACOLOGICAL TREATMENTS²⁷ IN AUTISTIC CHILDREN

Watling RL, & Dietz J. (2007). Immediate effect of Ayres's sensory integration-based occupational therapy intervention on children with autism spectrum disorders. *American Journal of Occupational Therapy*, 61(5), 574–583. Retrieved from <https://search.ebscohost.com/login.aspx?direct=true&db=ccm&AN=105971173&site=eds-live>

Appendix A

Literature Review Table

Author (Year) Title Citation	Purpose	Design and Sample	Methods	Limitations and Strengths	Findings
<p>Intranasal oxytocin versus placebo in the treatment of adults with autism spectrum disorders: a randomized controlled trial</p> <p>Anagnostou, E., Soorya, L., Chaplin, W., Bartz, J., Halpern, D., Wasserman, S., ... Hollander, E. (2012). Intranasal oxytocin versus placebo in the treatment of adults with autism spectrum disorders: a randomized controlled trial. <i>Molecular</i></p>	<p>To study the supports the therapeutic potential and safety of daily administration of IN-OXT for social cognition/function deficits and possibly repetitive behaviors in adults with ASD</p>	<p>- Pilot, randomized, double-blind, placebo-controlled, parallel design trial</p>	<p>- 19 adults with ASD, 16 males</p> <p>- Recruited through advertisements in local media</p> <p>- Subjects were randomized to 24 IU intranasal oxytocin or placebo in the morning and afternoon for 6 weeks</p>	<p><u>Limitations</u></p> <p>- Duration of the study was only 6 weeks and as such we may have underestimated the potential impact of oxytocin on core symptom domains</p> <p>- The three female participants were all premenopausal and on no hormonal contraception, but we did not collect data on the time of menstrual cycle that may potentially interact with oxytocin</p> <p>- Study did not follow-up the participants once the medication had been stopped</p>	<p>- 6-week use of IN-OXT versus placebo resulted in improvements in aspects of social cognition, repetitive behaviors and emotional wellbeing in some, although not all</p> <p>- Study did not report any serious adverse effects and IN-OXT was well tolerated</p> <p>- Participants administered with oxytocin showed improved positive evaluations of appearance and speech performance, suggesting that following exposure therapy the administration of oxytocin improved</p>

Author (Year) Title Citation	Purpose	Design and Sample	Methods	Limitations and Strengths	Findings
<p><i>Autism</i>, 3(1), 16–24. https://doi.org/10.1186/2040-2392-3-16</p>				<p><u>Strengths</u> - Pilot study suggests that there is therapeutic potential to daily administration of intranasal oxytocin in adults with ASD and that larger and longer studies are warranted</p> <p>- First study to employ an acute treatment trial of daily administration of IN-OXT in ASD</p>	<p>the mental representations of self</p>
<p>The Effects of Therapeutic Horseback Riding on Social Functioning in Children with Autism</p> <p>Bass MM, Duchowny CA, & Llabre MM.</p>	<p>To study the effects of therapeutic horseback riding on social functioning in children with autism</p>	<p>- Quasi-experimental - Hypothesis testing</p> <p>- Participants randomly assigned to experimental or control group</p> <p>- 34 children with ASD had 12 weeks of therapeutic</p>	<p>- Social Responsive Scale (SRS) and Sensory Profile (SP) were used to assess social functioning at pre and post intervention</p> <p>- Received a therapeutic riding session 1 hr/week</p>	<p><u>Limitations</u> - No information about medication regimens</p> <p>- Limited to case reports and descriptive studies</p> <p>- Unknown if parents of participants in either</p>	<p>- Results suggest that therapeutic horseback riding may be an efficacious therapeutic option for children with ASD</p> <p>- Compared to control group, ASD children in the experimental group improved in critical</p>

Author (Year) Title Citation	Purpose	Design and Sample	Methods	Limitations and Strengths	Findings
(2009). The effect of therapeutic horseback riding on social functioning in children with autism. <i>Journal of Autism & Developmental Disorders</i> , 39(9), 1261–1267. https://doi.org/10.1007/s10803-009-0734-3		horseback riding and one post testing session	over span of 12 weeks - 2 x 2 mixed design repeated measure analysis of variance (ANOVA) examined whether treatment resulted in an increase in social functioning for experimental group compared to control	experimental/control group were taking part in any therapy or self-help classes - Intervention lasted only 12 weeks - 6 participants dropped out of experimental group, 3 from control <u>Strengths</u> - Innovative - Other studies have examined the effects of animal assisted therapy	areas such as sensory integration and directed attention - Participants demonstrated a sustained level of directed attention and focus, usually not seen in children with ASD
Risperidone and Explosive Aggressive Autism Horrigan JP, &	To explore the application of risperidone in a broader age range of autistic individuals with severe explosive	- Quantitative and Qualitative - Complete physical examination, including a neurological	- Autism had to be primary condition - Risperidone administered in an open-label, nonblind fashion to	<u>Limitations</u> - Possible that risperidone may have lowered the seizure threshold in a vulnerable individual, similar to	- Substantial clinical improvement was noted almost immediately in each patient, with aggression, self-injury, explosivity,

Author (Year) Title Citation	Purpose	Design and Sample	Methods	Limitations and Strengths	Findings
Barnhill LJ. (1997). Risperidone and explosive aggressive autism. <i>Journal of Autism & Developmental Disorders</i> , 27(3), 313–323. Retrieved from https://search.ebscohost.com/login.aspx?direct=true&db=ccm&AN=105822413&site=eds-live	aggressive, with the supposition being that risperidone might prove to be a more effective and better tolerated agent than the other classes of medications	examination and lab work - Side effects monitored via standardized questions addressing such issues as changes in appetite or sleep hygiene, somatic complaints	11 males - Patient age range from 6-34 years old	the potential of other neuroleptics - A larger scale, placebo-controlled study involving both sexes would be worthwhile to confirm these initial findings - Little written on the use of risperidone in the autistic population <u>Strengths</u> - Further develop and learn about risperidone effects on autism - Treatment was individualized for each candidate, doses were titrated upwards, gauged by adult caretaker report	and poor sleep hygiene most improved - Marked clinical improvement was noted in each patient, with the most significant gains noted within the first 24 hours of risperidone therapy in all but one patient (Patient A) - Aggression (hitting, kicking, biting), self injury (head-banging, self-biting), explosivity (sudden, intense tantrums occurring with little or no provocation), overactivity (persistently elevated levels of motor activity), and poor sleep hygiene (difficulty falling

Author (Year) Title Citation	Purpose	Design and Sample	Methods	Limitations and Strengths	Findings
					<p>asleep, difficulty staying asleep) diminished most significantly</p> <p>- Further advances in the dose were ceased after the onset of unwanted side effects or after all parties had agreed that a satisfactory degree of improvement had occurred</p>
<p>Effects of water exercise swimming program on aquatic skills and social behaviors in children with autism spectrum disorders</p> <p>Pan, C.-Y. (2010). Effects of Water Exercise</p>	<p>To determine the effectiveness of a 10 week water exercise swimming program (WESP) on the aquatic skills and social behaviors of 16 boys with autism spectrum disorders (ASD)</p>	<ul style="list-style-type: none"> - Quantitative, experimental design - Controlled, single-blind design 	<ul style="list-style-type: none"> - Within-participant repeated measures design - Each participant was assessed 3 times, once at study entry (baseline), second time after 10 weeks of regular treatment/activity, third time after another 10 weeks 	<p><u>Limitations</u></p> <ul style="list-style-type: none"> - Low sample size, small age range, and single gender of participants (male) - Difference in cognitive abilities and gross motor skills were not evaluated and might have influenced findings 	<ul style="list-style-type: none"> - Analysis revealed a significant main effect of time on the academic behavior and all antisocial behaviors - Results indicated that the WESP improved the aquatic skills in 4/5 stages as measured with percentage scores, and decreased the

Author (Year) Title Citation	Purpose	Design and Sample	Methods	Limitations and Strengths	Findings
<p>Swimming Program on Aquatic Skills and Social Behaviors in Children with Autism Spectrum Disorders. <i>Autism: The International Journal of Research and Practice, 14(1), 9–28.</i> Retrieved from https://search.ebscohost.com/login.aspx?direct=true&db=eric&AN=EJ872183&site=eds-live</p>				<p>- More research needed to understand the impact of these variables on health-promoting physical activities in this population</p> <p><u>Strengths</u></p> <p>- WESP starts with a mental adjustment to the activity and factors associated with it. As the program progressed, more dynamic and challenging tasks</p> <p>- Aquatic activity exercises the total body without putting excessive stress or tension on specific body parts</p> <p>- Instructors and children perform the same techniques, and this provides</p>	<p>total antisocial behavior problems in children with ASD</p> <p>- All strategies implemented with the goal of making the social interaction mutually reinforcing to both the children with ASDs and their instructors and peers</p>

Author (Year) Title Citation	Purpose	Design and Sample	Methods	Limitations and Strengths	Findings
				opportunities for children and parents to participate together following identical routines	
<p>Effectiveness of Sensory Integration Interventions in Children with Autism Spectrum Disorders: A Pilot Study</p> <p>Pfeiffer, B. A., Koenig, K., Kinnealey, M., Sheppard, M., & Henderson, L. (2011). Effectiveness of sensory integration interventions in children with autism spectrum disorders: a pilot study. <i>American</i></p>	<p>To provide preliminary information on the effectiveness of SI interventions for children with ASDs and to obtain pilot data to guide future</p>	<p>- Pilot study</p>	<p>- Children ages 6-12 with ASD who attended a summer therapeutic activities program, were randomly assigned to a fine motor or SI treatment group</p> <p>- Total of 32 boys and 5 girls, similar to ratio of ASD</p> <p>- Interventions were provided in context of the summer therapeutic activities program</p>	<p><u>Limitations</u></p> <p>- Issues with objective measurement tools for children on the autistic spectrum (standardized measures are inappropriate because of the wide variety in behavioral and developmental levels and the ability of a child with ASD to complete the test while maintaining test validity</p> <p>- Ensure participants are more homogenous so effectiveness of interventions can be</p>	<p>- Results identified significant positive changes in Goal Attainment SCaling scores for both groups, more significant changes occurred in the SI group, and a significant decrease in autistic mannerisms occurred in the SI group</p> <p>- Results showed significant post intervention differences in social responsiveness between the SI and FM group</p> <p>- Children in the SI</p>

Author (Year) Title Citation	Purpose	Design and Sample	Methods	Limitations and Strengths	Findings
<p><i>Journal of Occupational Therapy</i>, 65(1), 76–85. https://doi.org/10.5014/ajot.2011.09205</p>				<p>detected, the group in this study varied greatly in their adaptive behavioral levels</p> <p>- Carry over interventions throughout daily routines which is more characteristic of OT services, and use measurement tools that are more individualized due to the diverse nature of people with autism</p> <p>- This study was over a short period of time, 3x/week for 6 weeks</p> <p><u>Strengths</u> - Multiple procedures/measurement tools used to identify and narrow results</p>	<p>group had significantly fewer autistic mannerisms after interventions</p>

Author (Year) Title Citation	Purpose	Design and Sample	Methods	Limitations and Strengths	Findings
				<p>- Treatment interventions were based on the individual needs of each child but included the 10 key therapeutic strategies identified in the fidelity tool</p> <p>- Results of study were mixed yet demonstrated significant changes in the autistic mannerisms (component of social responsiveness) and significant progress toward individual goals in the areas of sensory processing and regulation, social-emotional function, and FM skills</p>	
Psychotropic	To examine	- Quantitative	- IAN project data:	<u>Limitations</u>	- A total of

Author (Year) Title Citation	Purpose	Design and Sample	Methods	Limitations and Strengths	Findings
<p>Medication Use Among Children With Autism Spectrum Disorders Enrolled in a National Registry, 2007-2008</p> <p>Rosenberg RE, Mandell DS, Farmer JE, Law JK, Marvin AR, & Law PA. (2010). Psychotropic medication use among children with autism spectrum disorders enrolled in a National Registry, 2007-2008. <i>Journal of Autism & Developmental Disorders</i>, 40(3), 342–351.</p>	<p>patterns of current psychotropic medication use among 5,181 children with autism spectrum disorders (ASD) enrolled in a Web-based registry</p> <p>1. Confirm Mandell’s findings regarding factors influence psychotropic medication use and comparative prevalence in a unique national dataset, the Interactive Autism Network (IAN) which includes children of varying insurance status</p> <p>2. Test the hypothesis that insurance status—</p>	<p>- IAN: Internet based research database</p>	<p>All families complete an initial registration and then are invited to complete several other questionnaires, including a profile on each affected child and a list of treatments that the child currently receives</p> <p>- Families do not supply overall insurance status in the IAN survey. Therefore, to examine the effects of type of insurance on psychotropic medication use, we examined data from all subjects who reported use of at least one medication and who reported payer</p>	<p>- The data are provided by Web-based parent-report, so diagnosis and treatment use are not validated</p> <p>- Selection bias, common to other community- and clinic-based studies, toward families with higher socioeconomic status (SES) and with Internet access</p> <p>- The insurance data were linked to individual treatments rather than individuals, and did not specify the reason for Medicaid eligibility (disability, income, or both)</p> <p>- The data include information only on</p>	<p>5,181 children in our sample had complete child and treatment information from April 2007 through October 20, 2008. The sample was predominantly 6–11 years of age (49%), was mostly male (83%), and often reported psychiatric comorbidities (39% with ≥ 1 comorbidity)</p> <p>- Overall, 35.3% of subjects used at least one psychotropic medication at the time of survey completion</p> <p>- The most common psychotropic medications were stimulants, neuroleptics, and antidepressants</p>

Author (Year) Title Citation	Purpose	Design and Sample	Methods	Limitations and Strengths	Findings
https://doi.org/10.1007/s10803-009-0878-1	<p>in addition to the demographic variables previously associated with medication use— affects use of prescription medications in ASD</p> <p>3. Investigate prescribing trends by medical specialty for children with ASD, given limited if any research in this area</p>		<p>information about that medication</p>	<p>the history of (not current status) seizure disorder, we are not able to determine if anticonvulsants are being prescribed for mood-stabilizing or antiepileptic properties</p> <p><u>Strengths</u> - Compared and strengthened previous studies about psychotropic med use and in this study, addressed demographics and insurance status</p>	<p>- White and African American participants reported similar percentages of psychotropic medication use</p> <p>- Hispanic participants were less likely to use any psychotropic medication</p> <p>- Among those children using a psychotropic medication with analyzable data (n = 1,575), those with no reported insurance coverage were significantly less likely to be on more than two medications than were those with private insurance, Medicaid, or a combination of</p>

Author (Year) Title Citation	Purpose	Design and Sample	Methods	Limitations and Strengths	Findings
					insurance types
<p>Psychotropic Medication Use and Polypharmacy in Children With Autism Spectrum Disorders</p> <p>Spencer, D., Marshall, J., Post, B., Kulakodlu, M., Newschaffer, C., Dennen, T., Azocar, F., Jain, A. (2013, October 21). Psychotropic Medication Use and Polypharmacy in Children With Autism Spectrum Disorders. <i>Pediatrics</i>.</p>	<p>To examine rates and predictors of psychotropic use and multiclass polypharmacy among commercially insured children with autism spectrum disorders (ASD)</p>	<p>- Retrospective observational study using an administrative claims database associated with a large US commercial health plan</p>	<p>- Using medical and pharmacy claims data with linked enrollment information, a total of 33 565 children with ASD who had at least 6 months of continuous medical, pharmacy, and behavioral health care coverage between January 2001 and December 2009 were identified</p> <p>- Eligible subjects had to be between the age of 0 and 20 years as of their first day of health plan enrollment during the study and without claims for childhood</p>	<p><u>Limitations</u></p> <p>- Misclassification of subjects with and without ASD is possible</p> <p>- Administrative claims data can be used to document prescription fills but not whether the patient actually took the prescribed medication or as directed, and claims do not capture over-the-counter medications</p> <p>- Did not examine dose or appropriateness of dose for a particular child or a particular diagnosis because appropriate dosing</p>	<p>- More white children ages 11 and older, had evidence of both psychotropic use and polypharmacy</p> <p>- A large proportion of children with evidence of epilepsy/seizures, ADD, anxiety, depression, and/or bipolar disorder were psychotropic users, and one-half or more had evidence of polypharmacy</p> <p>- Among a sample of 33,565 commercially insured children with ASD in the United States, we found that 64% used at least 1 psychotropic</p>

Author (Year) Title Citation	Purpose	Design and Sample	Methods	Limitations and Strengths	Findings
https://doi.org/10.1542/peds.2012-3774			<p>disintegrative disorder or Rett syndrome</p> <p>- Subjects were required to have 1 period of at least 6 months of continuous enrollment but may have had more enrollment time with all 3 types of coverage during the study</p>	<p>often depends on a child's weight (possibly resulted in overestimation of psychotropic use and polypharmacy)</p> <p><u>Strengths</u> - Detailing psychotropic use and polypharmacy among children with ASD is crucial for informing families, clinicians, and researchers</p>	<p>medication, and just more than one-third had evidence of psychotropic polypharmacy during an average length of enrollment of 3+ years</p> <p>- Children from the southern region were significantly more likely than children from the northeast and west to be multiclass polypharmacy users, raising questions about the availability of nonpharmacologic, behaviorally based services and treatments in the south, where other health outcomes and health care services have been found to be poorer than in</p>

Author (Year) Title Citation	Purpose	Design and Sample	Methods	Limitations and Strengths	Findings
					<p>other parts of the country</p> <p>- Study highlights the need for primary care providers to carefully elicit medication histories and monitor symptoms for evidence of effectiveness</p>
<p>Immediate Effect of Ayres’s Sensory Integration-Based Occupational Therapy Intervention on Children With Autism Spectrum Disorders</p> <p>Watling RL, & Dietz J. (2007). Immediate effect of Ayres’s sensory</p>	<p>To examine the effects of Ayres’s sensory integration intervention on the behavior and task engagement of young children with autism spectrum disorders (ASD)</p>	<p>- Single-subject study used ABAB design to compare immediate effect of Ayres’s sensory integration and a play scenario on the undesired behavior and task engagement of 4 children with ASD</p>	<p>- 4 boys between age 3 years 0 months - 4 years 4 months</p> <p>- Independently diagnosed with ASD</p> <p>- No comorbid diagnoses, absence of seizures, no concurrent OT services, no intention to add/change meds or therapy during course of study</p>	<p><u>Limitations</u></p> <p>- Constraints imposed by the operational definition of engagement</p> <p>- Small sample size</p> <p>- Complications in rating engagement</p> <p>- Short duration of the A2 phases</p> <p>- Potential bias in subjective observations</p>	<p>- Data suggested that Ayres’s sensory integration had a positive effect on transitions, socialization, compliance, and general behavior regulation, evident during intervention sessions and at in home environments</p> <p>- Subjective data recorded in the study logs suggest that new behaviors emerged</p>

Author (Year) Title Citation	Purpose	Design and Sample	Methods	Limitations and Strengths	Findings
<p>integration-based occupational therapy intervention on children with autism spectrum disorders.</p> <p><i>American Journal of Occupational Therapy</i>, 61(5), 574–583.</p> <p>Retrieved from https://search.ebscohost.com/login.aspx?direct=true&db=ccm&AN=105971173&site=eds-live</p>				<p>recorded by study personnel and caregivers</p> <p><u>Strengths</u></p> <ul style="list-style-type: none"> - Study was carried out in a systematic manner and treatment sessions met proposed criteria for Ayres’s sensory integration - Both interventions were carried out by same OT, controlling effect of therapist characteristics on therapist-participant interaction - Raters for engagement and undesired behavior were blind to which intervention condition preceded the data collection 	<p>during the Ayres’s sensory integration sessions for each participant; behaviors changed in home environments as well</p> <ul style="list-style-type: none"> - Results of this study were consistent with those reported by Smith et al. (2005), who found no change in frequency of undesired behaviors immediately after Ayres’s sensory integration

Author (Year) Title Citation	Purpose	Design and Sample	Methods	Limitations and Strengths	Findings
				period - Study had high interrater agreement on the dependent variable ratings and high procedural reliability	