An-Najah National University

Faculty of Graduate Studies

THE EFFECTIVENESS OF PICTURE EXCHANGE COMMUNICATION SYSTEM (PECS) PROGRAM IN DEVELOPING COMMUNICATIVE SKILLS AMONG CHILDREN WITH AUTISM SPECTRUM DISORDER

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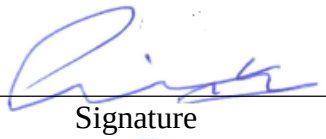
Prof. Abed Assaf	
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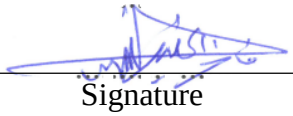
Dr. Ola Hussein	
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Dedication

I dedicate this Thesis to

All autistic children.

My mother, who has provided me with strength, love, tenderness, and constant support.

My father, an incredibly generous man.

My instructor, Dr. Fakher, for his endless support and dedication to help me with this thesis.

and to My friends and colleagues.

Thanks, and Appreciation.

I thank Allah for his blessings and guidance in writing this thesis and hope it will be beneficial for my life and religion.

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Thanks to the students who were part of this study.

Warm thanks to my mother, Amal, for her patience, prayers, and unconditional love are the reasons I grow.

Thanks to everyone who supported me in writing this thesis. I highly appreciate it.

Declaration

I, the undersigned, declare that I submitted the thesis entitled:

THE EFFECTIVENESS OF PICTURE EXCHANGE COMMUNICATION SYSTEM (PECS) PROGRAM IN DEVELOPING COMMUNICATIVE SKILLS AMONG CHILDREN WITH AUTISM SPECTRUM DISORDER

I declare that the work provided in this thesis, unless otherwise referenced, is the researcher's own work, and has not been submitted elsewhere for any other degree or qualification.

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THE EFFECTIVENESS OF PICTURE EXCHANGE COMMUNICATION SYSTEM (PECS) PROGRAM IN DEVELOPING COMMUNICATIVE SKILLS AMONG CHILDREN WITH AUTISM SPECTRUM DISORDER

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Abstract

Study Background: Autism spectrum disorder (ASD) is a complicated developmental illness characterized by chronic difficulties with social communication, limited interests, and repetitive behavior affecting day-to-day performance. Many studies have shown that Picture Exchange Communication System)PECS(is one of the alternative enhanced communication components, which helps to teach functional communication skills, enhances language development and accepted social behaviors, and limits problematic behaviors, through an educational program built with six phases, which shall be discussed over the course of this thesis.

Methodology: the study adopts a quasi-experimental method which applies by selecting a control group and an experimental group who took the pre-test and the post-test to test the effect of the independent variable a PECS group program was used on the dependent variable Communication Skills - Verbal, Nonverbal, and Social Communication Skills - among autistic children. control and experimental groups was used. Thus, with parents' consent, 20 students who were diagnosed to have autism whose ages are between 4 - 7 years old, have been selected as the study sample. Those skills are tested by, creating a scale that aims to evaluate verbal and non-verbal skills. Hence, PECS was used with the experimental group, while there was no intervention made with the control group. The pre-test and the post-test were done for both groups to evaluate the autistic children's ability to communicate before and post using PECS aiming to acknowledge the results and analyze them.

Results: The results have reflected that PECS can raise the communication skills level among autistic children. Thus, it has raised noticeably the verbal, nonverbal, and social communication skills for autistic children. In addition, the results have shown that

younger autistic children have benefited more than older peers. They have further proved that early intervention using PECS has a positive outcome, as it focuses on raising the rhythm, shape, and purpose of communication actions to gain different skills at a young age and employ the learned skills in several environments while developing verbal and nonverbal communication abilities.

Keywords: Autism Spectrum Disorder, PECS, Communication skills, verbal and nonverbal communication.

Chapter One

Theoretical Framework and Previous Studies

1.1 Introduction

ASD is a neurodevelopmental disorder defined by communication and social interaction challenges, as well as repetitive and restricted behavior patterns, activities, and interests that have been present since childhood and influence the person's everyday functioning (AlSalehi & Alhifthy, 2020).

Autism is a Neurodevelopmental disorder, due to which, many children diagnosed with autism do not speak even though they are capable of doing so. Additionally, they may experience anxiety when engaging in conversation and may feel shy to talk. The term "autism" comes from the Greek word "autos," which indicates the meaning "self." Several researchers and psychotherapists believe that autism is a connected disorder, which was coined by Leo Kanner, a doctor at Johns Hopkins University, in the 1940s to describe children's behavior that was socially and expressively constrained (Drozdiel, 2012).

Over the last few years, the prevalence of ASD has risen at an alarming rate, as it is currently believed to be one in every 68 people, present four times as common in boys than in girls (Drozdiel, 2012). Communication, adaptive and social abilities, as well as overall cognitive functioning, are all influenced by ASD, and it is a widespread disorder that lasts a lifetime. Furthermore, the disorder is frequently associated with a variety of issues that include demanding behaviors, and psychopathology. Although the cause of the elevating rates is unknown, the fact remains that demand for specialized educational services has grown in lockstep with it (McMahon & Cullinan, 2014).

Bondy and Frost (1994) at the Delaware Autism Project created PECS in 1985. PECS stands for Picture Exchange Communication System; A nonverbal communication system that can be used with patients of any age. Nonverbal people in general utilize visuals to represent their needs and preferences and make decisions. In the case of children diagnosed with autism, PECS constitutes a graphical representation of food options or activities that nonverbal special education children can use to communicate their needs and preferences, where Children express themselves by selecting from a set

of picture cards displayed. When giving cards to students, trained PECS professionals stimulate them with food rewards, from then on, teachers along with therapists encourage children to give acceptable verbal responses whilst edible rewards are gradually reduced (Lagos et al., 2021).

This research will conduct an empirical study on the influence of PECS treatment program on preschool special education students with autism aged 4-7 and its effects on the children's ability to express themselves and communicate verbally, furthermore expressing the pictures handed to them verbally. The materials used will include Picture timetables, visual signals, sign language, PECS, and video modeling. In pre-school settings, picture timetables were frequently used to familiarize children with routines and develop their ability to predict everyday events" (Drozdiel, 2012).

The importance of this research relies on the fact that early intervention is beneficial to children with autism; as it focuses on increasing the frequency, form, and function of communication acts. It also employs variable degrees of adult orientation, such as adult-directed activities to increase communicative initiation and to carry over learned skills to new settings and communication partners which has been demonstrated to be useful in the development of language and communication skills (Elder & Paul, 2008).

1.2 Autism Spectrum Disorder

The definition of the word "autism" underwent a fundamental transition in the early 1960s in Britain, coinciding with an increase in epidemiological and statistical investigations into child psychiatry (Evans, 2013).

Dr. Eugene Bleuler, a Swiss psychiatrist, made a remarkable discovery in 1911. While investigating people with schizophrenia, a label he invented, he observed that many of the same patients exhibited symptoms that he hadn't previously diagnosed. These patients appeared fully withdrawn, indifferent to their surroundings, and completely self-absorbed. In his search for a phrase to characterize them, he came upon the term "autism," which is derived from the Greek word "autos," which means "self," in this instance, entirely self-absorbed (Andreasen, 1999).

His tutor, Franz Hamburger, brought Hans Asperger to the Heilpädagogische Station (founded in 1911 by Erwin Lazar, 1877–1922) in 1931. Hans Asperger describes the

cause of autism as youth’s poor awareness of the emotional meaning of the spoken word. Concurrently, he is described as focused on hidden intelligence, fixations, and communication impairments (Muratori et al., 2021).

The term "autistic psychopaths" first appeared in the modern sense in 1938, when Hans Asperger of the Vienna University Hospital used Bleuler's concept in a German lecture on child psychology. Asperger was researching a kind of ASD now known as Asperger syndrome, which was not widely recognized as a distinct diagnosis until 1981 for a variety of reasons (McGuinness, 2022).

Leo Kanner, an American psychiatrist, coined the phrase "early infantile autism" in 1943 to describe youngsters who were uninterested in other people. In 1944, Asperger defined another group of children with similar habits but less intensity and greater intellectual ability. Since then, his name has become synonymous with Asperger syndrome, a milder form of autism. The phrase "widespread developmental disorders" was not coined until the 1980s. (Faras et al., 2010)

In 1943, the first report of early infantile autism was given by child psychiatrist Leo Kanner in the United States, which inspired psychiatrists to explore what they dubbed emotionally chilly moms, or refrigerator moms. In 1949, Kanner wrote "Problems of Nosology and Psychodynamics in Early Infantile Autism." Kanner characterized autistic children as being raised in emotional freezers (Cohmer, 2014).

In the early 1960s, Kanner identified the etiology of autism's emotional coldness from parents, commonly linking autism to a lack of parental warmth. In the 1960s, Bernard Rimland and Bruno Bettelheim, both from the United States, differed on the significance of psychogenesis in autism. Rimland proposed that the etiology of autism was based on neurological development, whereas Bettelheim emphasized the importance of early childhood caregiving. Nonetheless, many moms expressed significant grief and hostility against child psychiatrists, who frequently made them feel as if they were to blame for their children's autism (Cohmer, 2014).

Bernard Rimland was a psychologist and the father of an autistic child. He did not agree with Bettelheim. He did not accept that his son's autism was caused by his or his wife's

parenting abilities. Bernard Rimland wrote Infantile Autism: The Syndrome and Its Implications for a Neural Theory of Behavior in 1964 (Castillo, 2020).

Autism became more well-known in the 1970s. In the early 1980s, the Erica Foundation began education and therapy for psychotic children. Many parents continue to associate autism with mental retardation and insanity (Haney, 2014).

Ole Ivar Lovaas examined and advanced the behavioral analysis and therapy of autistic youngsters. Lovaas' experimental behavior analysis was first met with modest success. He designed it for younger children (those under the age of five), applied it at home, and increased the intensity (a measurement of the quantity of "therapy time") to roughly 40 hours per week. In 1981, Lovaas published Teaching Developmentally Disabled Children: The Me Book. Lovaas published Teaching Individuals with Developmental Delays: Basic Intervention Techniques (Gitimoghaddam et al., 2022).

1.2.1 Autism definition

With the evolution of the concept of autism over the years, as well as recent research and studies attempting to explain it, there are many concepts referring to this disorder, but they all fit into one mold and share the basic characteristics of autism, among the most important of these definitions:

1.2.1.1 Cambridge Dictionary

A brain condition that affects the development of social and communication skills in ways that can be severe or minor and that can cause someone's behavior and interests to differ from those of people who do not have the condition. a condition that begins in young children and causes unusually self-centered behavior while limiting the development of social and communication skills (McDonald et al., 2013).

1.2.1.2 American Psychiatric Association (APA)

ASD is a complex developmental condition marked by recurrent behaviors, restricted interests, and ongoing challenges with social communication. Although autism is a lifelong condition, each autistic person has different levels of functional impairment as a result of these problems (Faras et al., 2010).

Pervasive developmental disorders (PDD) are a collection of neurodevelopmental illnesses (PDD). Three fundamental deficiencies set these disorders apart: limited, repetitive, and stereotyped behavioral or interest patterns; inadequate communication; and impeded reciprocal social engagement. These deficiencies vary in intensity and scope, and they often change when other developmental skills are acquired (Skeppar et al., 2013).

1.2.1.3 Definition of Autism in DSM-V (2013)

Autism is a spectrum condition and a lifelong, nonprogressive neurological illness that normally manifests before the age of three. Autism symptoms and traits can appear in a wide range of combinations, from mild to severe. Although autism is defined by a specific collection of characteristics, children and adults can display any mix of these traits in any severity. Two children with the same condition might behave and perform significantly differently from one another (Mason, 2005).

1.3 Diagnostic Features of autism spectrum disorder

A person with autism will always have this condition. It has distinct features and manifestations unique to each age group (Prizant & Fields-Meyer, 2022).

Autism spectrum disorder, or ASD, is a developmental disability brought on by variations in the brain. Patients with ASD may suffer with restricted or repeated behaviors or interests, as well as social involvement and communication. Additionally, learning, movement, and attention spans can all vary in people with ASD. It is important to keep in mind that some individuals may display some of these symptoms even if they do not have ASD. However, these characteristics may make life very challenging for those who have ASD (Bhandari et al., 2020).

While there has been much debate about many aspects of the disorder over the years, there is now some agreement on the behavioral traits linked with the diagnosis. These include the disorder's onset in the early preschool years; severe and pervasive deficits in social behavior and attachments; deficits in speech and language; insistence on maintaining sameness; unusual responsiveness to sensory environment; self-stimulation; self-injurious behavior; isolated skill areas; and inappropriate effect (Schreibman,

1988). Despite it, many people face delays in receiving an autism diagnosis and related assistance (Lappé et al., 2018).

At both ends of the spectrum diagnosis is complicated in youngsters. Children with very severe autistic symptoms might be indistinguishable from those with pure severe intellectual impairment, while those with milder symptoms might be misclassified as having a language disorder or social phobia. Dev developmental warning sign of potential autism spectrum disorder in children see table 1. However, developmental warning sign of potential autism spectrum disorder in children groups was used; control and experimental groups (Faras et al., 2010).

Table 1

Representative the common warning signs of autism spectrum disorder

Pre-school children	
Communication difficulty	Speech that is delayed or missing. Nonverbal communication deficits, such as a lack of pointing or difficulties following a point.
Social handicap	Neglectful facial expressions or emotions of others. Pretend play is underdeveloped. The child has little to no imagination. Indifference to peers or near play with others on purpose. Lack of activity initiation. An inability to share joy.
Impaired interests, activities, or behaviors	The hand motions and finger twitches are a bit too strange or repetitive. inflexibility regarding change. Repetitive toy play (e. g, lining up the same toys; flicking on and off lights).
School-age children	
Communication difficulty	One example of a language development disorder is muteness. Echolalia that persists. Unusual vocabulary for the age/social group of the kid.
Social handicap	Inappropriate efforts at collaboration (e.g., may manifest as aggressive or disruptive behavior). Unawareness of classroom "norms" (criticizing teachers, unwilling to cooperate in classroom activities).
Impaired interests, activities, or behaviors	Lack of adaptability in cooperative creative play/creativity. Inability to adapt to change. The presence of uncommon actions, such as an unexpected reaction to sensory inputs.

Note: adapted from "Autism spectrum disorders", by Faras, H., Al Ateeqi, N., & Tidmarsh, L. (2010). *Annals of Saudi medicine*, *30*(4), 295–300. https://doi.org/10.4103/0256-4947.65261

And in the Diagnostic and Statistical Manual of Mental Disorders (DSM5's) clarification of the diagnostic signs of autism spectrum disorder, it is distinguished by chronic difficulty in reciprocal social communication and social interaction as well as confined, repetitive patterns of behavior, interests, or hobbies. These symptoms appear in early infancy and hinder or impair daily functioning. It goes on to say that manifestations of the disorder vary widely depending on the severity of the autism condition, developmental level, and chronological age; therefore, the name spectrum (Kulage et al., 2014).

1.4 Diagnostic Criteria for Autism Spectrum Disorder

The diagnosis of autism spectrum conditions changes in tandem with the advancement of research and investigation. One example is the variation in diagnostic criteria between DSM4 and DSM5.

As stated by Hassan and Khashab (2018), table 2 summarizes the main alterations between the updated fourth edition (2000) and the fifth version (2013).

Table 2

The main alterations between the updated fourth edition DSM IV-RT, 2000 and the fifth version DSM -V, 2013

Standards	DSM 4 – RT	DSM 5
Noun Disorder	Autism and its associated disorders are defined as pervasive developmental disorders.	The notion evolved into ASD, which was categorized as a neurodevelopmental condition.
Components of Disorder	It includes 5 sub-types: 1. Autistic Disorder. 2. Asperger's Disorder. 3. Rett's Disorder. 4. Childhood Disintegrative Disorder. 5. PDD-NOS.	They were combined under one name, ASD, with the abandonment of Rett syndrome and included in it, intellectual disorder.
Diagnostic Criteria	three criteria: 1. social interaction 2. repetitive patterns of behavior 3. social communication	ASD is distinguished by 1) social communication and social interaction difficulties 2) confined repetitive behaviors, interests, and hobbies (RRBs). Because both components are necessary for ASD diagnosis, social communication disorder is identified in the absence of RRBs.
Number of Diagnostic Symptoms	12 behavioral presentations are distributed, four for each criteria diagnosis.	7 behavioral symptoms are distributed, 4 of them on the criteria diagnosis and 3 of them on the second criteria diagnosis.
Identification of Severity Level	Five different disorders represent a difference in the severity of symptoms.	There are three levels of severity in each diagnostic criterion within one category.
Associated with other disabilities	Undefined	Rett syndrome, Selective mutism, Language disorders and social (pragmatic) communication disorder, Intellectual disability (intellectual developmental disorder) without autism spectrum disorder, Stereotypic movement disorder. Attention-deficit/hyperactivity disorder and Schizophrenia dsm5-apa, 2013.
Age range of symptoms	3 years	8 years

Note: adapted from "*Diagnosing autism between the revised fourth edition* (2000.dsm iv-tr) and the fifth edition (2013, dsm-5-(apa).", by Hassan, Z., & Khashab, S. (2018). *Al-Fath Journal for Psychological and Educational Studies, 2, pp. 137-148.*.

As for DSM 5, the diagnosis was as follows

A. persistent deficiencies in social interaction and communication in a variety of contexts, as demonstrated by the following, either historically or presently (Schwartz et al., 2021). (Examples are illustrative; see text for a list of examples),

1. These deficits in social-emotional reciprocity can manifest themselves as atypical social behavior and inability to participate in normal back-and-forth conversation, limited sharing of interests, emotions or affect plus failure to initiate or respond to overtures made for you.

2. Deficits affecting nonverbal communication during social engagements can incorporate inconsistencies between verbal and nonverbal signals, abnormalities in eye contact and body language, or shortfalls in comprehending and employing gestures. In some severe cases, such impairments result in a complete absence of facial expressions and nonverbal communication altogether. However, more moderate deficits may allow for intermittent understanding and expression through nonverbal means, despite inconsistencies.

3. Impairments in establishing, maintaining and understanding relationships, such as problems adjusting behavior to suit various social contexts; difficulties sharing imaginative play or friends; and little interest in acquaintances.

Specify current severity

Severity is determined by social communication deficits and confined, repetitive patterns of conduct.

B. Restricted, repeated patterns of behavior, interests, or activities, as demonstrated by at least two of the following, either now or in the past (Uljarević et al., 2022).

(Examples are illustrative, not complete; see text)

1. Repetitious or stereotyped speech, usage of items, or motor movements (e.g., echolalia, idiosyncratic sentences, lining up toys or flipping things, basic motor stereotypes).

2. Insistence on consistency, rigid adherence to routines, or ritualized patterns of verbal or nonverbal behavior (for example, extreme distress at slight modifications,

difficulties with shifts, rigid thought patterns, meeting rituals, or an urge to take the same route or eat the same food every day).

3. Need for sameness, adherence to routines, or ritualized patterns of verbal or nonverbal behavior (e.g., extreme distress at slight change, difficulties with transitions, rigid thinking patterns; turn-taking rituals; need to take the same route or eating the same food every day).

4. The senses of neurodivergent individuals often experience stimuli differently. For some, pain thresholds vary, or certain sounds, textures, or lights elicit intense displeasure. Others seem preoccupied with environmental details, avidly exploring surfaces through touch or investigating shifting shadows. Meanwhile, temperature extremes go unnoticed. Such hyper- or hyperreactivity to sensory input describes an atypical focus on sensory elements rather than interpersonal exchanges.

Specify current severity

C. Social interactions and restricted interests are used to gauge the severity of symptoms. While communication challenges and repetitive behaviors often emerge early in development, their impact may only become fully apparent once increased social demands exceed limited abilities. Some signs could initially be masked by compensatory strategies acquired to navigate the world over time. However, tell-tale signs are most readily observable from the initial stages of social development (McGinley & Varchevker, 2018).

D. Clinically substantial impairment in social, vocational, or other major domains of present functioning is caused by symptoms (Harvey et al., 2007).

E. Global developmental delay or intellectual impairment (previously referred to as intellectual developmental disorder) does not offer a better explanatory alternative for these impairments. Autism spectrum disorder occurs frequently in individuals with intellectual impairment as well, and hence, social communication must be below what would be expected by general development level to qualify both disorders as cooccurring (Durà-Vilà et al., 2010).

1.5 Risk and Prognostic Factors

Although the main concern of research on autism spectrum disorders has focused on genetic influences and medical conditions, other evidence clearly states that the etiologic factors of autism spectrum disorders are multifactorial. This means that non-genetic factors also play a role in the etiology of autism, although little is known (Manalu et al., 2013). Some of the etiologies or causes of autism that come from the environment are as follows:

1. Genetic and physiological: A new human gene discovered by the UC Davis MIND Institute has been connected to embryonic brain development and ASD. The gene is also linked to the mother's early prenatal vitamin consumption and placental oxygen levels (Li et al., 2018).

   Pregnancy or the prenatal period Among the factors in this period are increased age of the father and mother, primipara (women who have given birth to a child), antepartum bleeding due to placenta previa and abruptio placentae, medications during pregnancy, pre-eclampsia, infections, and stress during childbirth (Manalu et al., 2013).

   Risk factors such as antepartum hemorrhage will cause fetal hypoxia, interfering with brain development or the emergence of brain abnormalities. Fetal hypoxia can also cause increased dopaminergic activity. The state of brain abnormalities and increased dopaminergic activity is closely related to autism (Manalu et al., 2013).

2. Parental age; the older the parents are when they have children, the higher the risk of the child suffering from autism. Research published in 2010 found that women aged 40 years had a 50 percent risk of having a child with autism compared to women aged 20-29. "It is not known with certainty the relationship between parental age and autism. However, this is thought to be due to the occurrence of gene mutations," said Alycia Halladay, Research Director for Autism Speaks Environmental Studies (Maleki et al., 2022).

3. Pesticides High pesticide exposure has also been linked to autism. Pesticides have been shown in several studies to interfere with the function of genes in the central

nervous system. Pesticide toxins, according to Dr. Alice Mao, professor of psychiatry, have an effect on people with autism talent (Maleki et al., 2022).

According to available scientific research, there are likely several variables that increase a child's risk of autism, including environmental and genetic factors. According to available epidemiological data, there is no indication of a causal relationship between the measles, mumps, and rubella vaccinations and autism. Previous studies that suggested a causal link were found to have methodological flaws. There is no evidence that any other childhood immunization increases the risk of autism. Evidence-based evaluations of the putative link between the preservative thiomersal and aluminum adjuvants in inactivated vaccines and the risk of autism have established unequivocally that immunizations do not raise the risk of autism (WHO, 2022).

1.6 Treatment

Autism is a very complex, multifaceted, and controversial phenomenon. As with all other chronic diseases that do not have a specific nature and cause, there is no one pill or technique for autism that can guarantee a complete cure within a certain period of time.

All currently existing specialized therapeutic methods are aimed at increasing the communication capabilities of autistic children and adults, developing their necessary communication skills, self-care, etc. These methods include sensory integrative therapy, which helps develop cognitive skills (Smith et al., 2015).

The list of the most essential therapies employed

1. Applied behavioral analysis (ABA) is the most researched model among intensive behavioral programs; this sort of approach focuses on the study of behaviors in order to identify the reasons (antecedents) and avoid undesirable reactions, offering the child with more effective alternatives. Studies show that it improves cognitive ability, linguistic skills, and adaptive behaviors in children with autism spectrum disorders. The present data, while not conclusive, allows for the recommendation of the ABA paradigm in the treatment of children with autism spectrum disorders (Larsson, 2013).
2. The intervention, which is based on the TEACCH ("Treatment and Education of Autistic and Related Communication Handicapped Children") program, strives to

enhance the child's quality of life by actively adjusting the environment to meet their requirements and by maximizing autonomy. Because the program has been found to increase motor skills, cognitive performance, social functioning, and communication in children with autism spectrum disorders, it is conceivable to anticipate an efficacy profile in favor of this intervention, which merits further investigation (Panerai et al., 2002).

3. Parent-mediated intervention programs are recommended for autistic children and adolescents because they can improve social communication and problem behaviors; assist families in interacting with their children; promote development; and increase parental satisfaction, empowerment, and emotional well-being (Conrad et al., 2021).

1.7 Theories of autism

A closer look at autism, the researcher found that each one has its own characteristics. They focus on the child's cognitive, social, and neurological development. Here are the main theories, with a brief explanation of each of them:

1. The Theory of Mind: scholars Schwartz Offek and Segal (2022) say that children who have autism have difficulties understanding mental states, such as their personal beliefs, emotions, and intentions toward themselves and others. This often creates problems for these children when they interact with others because they are unable to consider the perceptions of others. According to research Rosello et al. (2020), its symptoms usually occur in early childhood. It is typically linked to changes in socializing with people around them. In addition, these children have problems expressing themselves, understanding issues around them, or understanding the behaviours of others.

2. Weak Central Coherence Theory: This theory's main claim is that autistic individuals process information differently than neurotypical children. Neurotypical children can understand the general meaning of the given information (Gough, 2024). However, individuals who have autism usually focus on small details rather than the general idea of the topic. Therefore, this theory helps scholars to understand why individuals who have autism may perform well at particular tasks that require attention to detail but find it difficult to do well in tasks that require integrating information into a coherent whole. The theory explains why those individuals are good at picking up

specific details but unable to integrate the whole picture of the topic (Alamdari et al., 2022).

3. Social Motivation Theory: this theory states that individuals who have autism are not motivated like normal children. They usually have less motivation and are unable to be engaged in social activities. Uljarević et al. (2021) demonstrated that those children have fewer opportunities in life due to their low motivation in engagement. Those children also face difficulties in communicating with others and their society. Uljarević et al. (2021) called for the importance of social interaction for those children to improve their personal and communication skills. Also, they called for urgent programs to help those children be engaged in society to increase their motivational skills.

4. Enhanced Perceptual Functioning Theory: the main focus of this theory is that children with autism have strong cognitive abilities. They are able to perceive and respond to sensory stimuli better than normal or typical children. Mukerji et al. (2021) demonstrated that those children have high sensitivity to sounds, lights, and other sensory exposures. Those children are quite sensitive to the surrounding environment, and contribute to difficulties in focusing on the broader context of situations.

1.8 Communication skills

"Communication may be viewed as a personal process involving the exchange of information as well as some behavioral content." Communication is something that people do and cannot exist without their taking action since it is about interpersonal interactions. It can be highly elaborate or very basic, formal or casual, depending on the nature of the communication and the connection between the sender and the receiver. Communication is the exchange of information and understanding between individual employees and organizational units, as well as the many methods and techniques through which they communicate (Ellison, 2015). This is to say that communication is the action of interacting with others to exchange information, ideas, thoughts, and emotions. Generally speaking, there are two types of communication: verbal and nonverbal. The former refers to when people express their ideas through spoken or written methods, whereas the latter is expressed through body language such

as gestures, movements, and facial expressions. Verbal communication is basically used by people when expressing themselves through a dissection with others and everyday activities. This type of communication varies among people depending on the listener's skills, volume, tone, and speech clarity. For verbal communication, the speaker can figure out how effective he is based on the feedback that they get from the listener (de Mooij, 2014; Addimando, 2024).

On the other hand, nonverbal communication usually happens without any kind of using words. Instead, people use it without uttering a single clue. Accordingly, three main areas affect nonverbal speech which are the tone of the speaker, body movement, and where you are looking while saying what it is you want to convey (Reith-Hall & Montgomery, 2022).

The theories that stand beyond communication are considered an important framework to help us understand how information is conveyed among people in different situations. Based on the literature, one of the most important theories is the Shannon and Weaver Model, which was first developed in the 1940s (Van Ruler, 2020). This theory focuses on the different aspects of communication, such as sender, receiver, method, message itself, and noise. Later, Berlo's SMCR (Source-Message-Channel-Receiver) Model was developed based on the earlier model. The developed model of Berlo's SMCR focused on the elements of communication due to its importance in the success of communication (Röhner & Schütz, 2023).

Another model is Schramm's Model. This model focused on the importance of exchanging information, experiences, and feedback to ensure proper communication. The main idea of Schramm's Model is that it focuses on a two-way process rather than a linear one. With these theories in mind, The Agenda-Setting Theory that is proposed by Maxwell McCombs and Donald Shaw argues that media does not necessarily tell us what to think, but rather what to think about. They argue that media affects the public’s understanding and changes their ideas about things around them (Rogala & Bialowas, 2016).

Similarly, George Gerbner introduced cultivation theory in the 1960s. This theory argues that television has a great influence on viewers. The main idea of this theory is that long-term exposure to media forms how media consumers perceive the world. It

also changes their perception of reality. This would lead to a distorted view of the world (Busselle & Van den Bulck, 2019).

Another major theory in the field is the spiral of silence. This theory studies human communication with each other (Noelle-Neumann, 1974). Its main claim is that people's willingness to express their opinions on controversial public issues is affected by their largely unconscious perception of those opinions as being either popular or unpopular. It assumes that people sometimes prefer to stay silent when they believe their views are those of the minority. Thus, the popular opinion in society forces other people to stay client and not to participate because they think that their opinion is unimportant, wrong, or unwanted.

Based on the short preview above, communication difficulties have long been thought to be a hallmark of autism. However, there are significant and diverse disparities in how people with autism communicate. This reflects not just the condition's intrinsic unpredictability but also the complexities of communication itself, which includes the words we use, the sequence in which we employ them, eye contact, facial expressions, gestures, and other nonverbal clues (Gerenser & Lopez, 2017).

These symptoms can make it difficult for autistic children to express themselves, talk with others, and establish connections. Therapists, such as applied behavior analysts, can assist children with ASD in improving their communication skills by using a mix of strategies (Watkins et al., 2017).

Depending on the person, autism spectrum disorder can influence speech or behavior in a number of ways (Hirota & King, 2023). Here are a couple of such examples Keeping eyes closed during chats or other social circumstances demonstrates a lack of empathy for others.

1. Participating in repeating movements or behaviors
2. Participating in self-harming or self-destructive activities, which may be recurrent (such as banging their heads repeatedly)
3. Failure to accurately perceive social cues
4. excessive concentration on a single subject
5. I lack the desire to interact with people.
6. Speaking with a monotone or flat tone

Some children's symptoms may be more prominent or troublesome than others. Various strategies (and technology) can be utilized to manage behavior and enhance communication in children with severe ASD symptoms (Zhao et al., 2018).

1.9 PECS cards

The PECS cards for communication are one of the approaches used in the development of several abilities for people with autism.

Bondy and Frost (1994) developed the PECS system. The system was created in 1994 as part of the Delaware Autistic Program, the country's biggest public-school program for autistic students. It was created for preschool-aged autistic children or people with a wide range of communicative, cognitive, and physical challenges. The results of the experiments show that using the PECS aids in the learning of functional communication skills; additionally, the PECS appears to promote language development, the consolidation of acceptable social behaviors, and a decrease in problem behaviors.

The PECS is a component of the Augmentative Alternative Communication framework, but it has its own uniqueness for autism spectrum disorders, so it is handled thoroughly. The PECS stands for "Communication System via Image Exchange," and it attempts to build functional communication and communication as a social exchange through a six-phase learning program- Phase I–VI (Farzana et al., 2021).

Phase I: Communication's "how": Students are taught how to trade a single image of the desired item/activity. The students learn to generalize the exchange by traveling to other individuals in different areas and their books and particular communication partners over long distances. In addition, kids are learning perseverance. Students learn to pick between two or more photographs in their communication books to enquire about their favorite things in Phase III. Training for discrimination begins with matching pictures of a desired and an unwanted object. The lesson is gradually expanded to include other photos of similarly popular things (Pyramid Educational Consultants, 2024).

Students learn to build basic phrases using the "I desire" symbol card, followed by the item image on a detachable sentence strip in Phase IV. Attributes and language expansion Students learn to use adjectives, verbs, and prepositions to extend their sentences. Students learn to utilize PECS to respond to the question "What do you

want?" in Phase V: Request for a Question. Students learn to respond in answer to queries such as "What do you see?" and "What do you hear?" in Phase VI. The acquired sentence structure is "I see," "I hear," "I feel," "It is...", and so on (Pyramid Educational Consultants, 2024).

In Wendt et al. (2019), in the study mentioned earlier, three preschool children diagnosed with ASD utilized a tablet-based PECS. The research goals were to compare application preference with traditional PECS. After participants had achieved, except for a low level of proficiency in both methods (the traditional method and a system - for example, an alternative communication book using reinforcement), an experimental research design was created to discover if the application was practical. From the results, it can be seen that the participants quickly learned and performed well with the application, and after the experiment, two of them preferred using the application. At the same time, one stayed in favor of the traditional PECS system based on the AAC communication book.

Images are used to express ideas and demands in a PECS. Children with ASD can quickly and efficiently convey particular requirements to their therapists, family members, and others by using PECS. According to some studies, PECS has been demonstrated to create "modest to moderate increases in communication." Other studies have found that "the first three steps of PECS are effective to extremely effective in training toddlers to request desired products." PECS may also assist youngsters in effectively adapting to utilizing voice-producing devices (SGDs). Cons— a PECS may have a restricted number of images from which children can choose (Alsayedhassan et al., 2016).

1.10 Previous studies

The authors bring some information about the background of the problem. The researcher presents the subject undertaken in this study and gives an overview of the related research. The researcher arranged them chronologically from the most recent to the oldest.

The study by Simeoli et al. (2024) aimed at investigating the effectiveness of two different Augmentative Alternative Communication tools for children with ASD. The Picture Exchange Communication System and Speech-Generating Device were used as

the two types of communication aids, and the participants were three children with severe autism meaning that all of the children were minimally verbal or non-verbal. The results show that both of the Augmentative Alternative Communication intervention types resulted in the increased communicative behavior. Moreover, the SGD acquisition training had a shorter period for one more participant, but two of the three participants who took part in the research have shown a preference for SGDs. Additionally, problem behavior reduced in one of the participants, and they improved vocal production. Therefore, PECS and SGD demonstrate similar results for developing initial request skills, and they can assist with speech production when they have some presuppositions. Thus, the study allows concluding that both PECS and SGD may be beneficial for children with autism and inappropriate to recommend over the other.

According to Tamanaha et al. (2023), their study is an evaluation of a program for applying PECS in children diagnosed with ASD who were either non-verbal or had limited verbalizations. The setting of this study is a clinic in a school managed by the Unified Health System – SUS. Study type: Longitudinal study The sample consisted of twenty-two children aged Six to twelve years with nonverbal ASD or limited verbal ability: 17 boys and five girls. It was a structured program with 24 individual speech-language therapy sessions conducted with the participation of family members. This was supplemented by materials from the 6 phases described in the PECS Training Manual. Results indicated that five children achieved at least the first three phases. For Phase IV, 82% of children achieved this level; in Phase V, only approximately 64% and just a fifth achieved Phase VI. Family follow-up was 96 %. Further, the children got to the discrimination and sentence formation stages and increased their vocabulary.

The Cognitive disorders lead to a perception problem with children diagnosed with autism. Communication disorders or any other cognitive control disorder equates to an emotional problem. Proper guidance directs children on how to fit in society despite the challenges faced with counseling being essential. During a learning program, a child diagnosed with autism can avoid communication disorders by optimizing their visual potential. With this article, we endeavor that it is proved that a review of the visual media literature enhances the visual potentiality of the children with autism. Here, I use a narrative review with steps such as determining the scope, search literature, and analysis. From the results, the Picture Exchange Communication System can enhance

the communication skills and basic behavior of children diagnosed with autism. Children with autism should use the Picture Exchange Communication System in daily lives via picture symbols. Wrap the SS model to enhance the Picture Exchange Communication System. Social stories can elaborate on how to engage in therapy and scrutinize social activity learning methods for students with autism through character-driven narratives. Applying the Picture Exchange Communication System and Social Story model gains more positive social behavior among autistic students. It can kindle receptive and expressive communication skills and the capacity to follow sanitation instructions. It also molds structured speech skills and improves the speech capabilities of the children (Kenila et al., 2022).

One of the most devastating disorders a child might experience is autism spectrum disorder. This condition can make communication and social interaction difficult for affected individuals. The current investigation explored perspectives on embracing the Picture Exchange Communication System, a structured approach to facilitating language in nonverbal or minimally verbal people. Specifically, the researchers interviewed five occupational therapists and four parents of children with autism spectrum disorder. These consultations aimed to gather insights through focus groups conducted via Google Meet, open-ended online questionnaires, and written correspondence shared over WhatsApp. Valuable data was collected from discussions with professionals and caregivers regarding the benefits and challenges of tailoring communication strategies to serve better the unique needs of each person on the autism spectrum. Findings for RQ1 are as follows: the utilization of PECS in English enhances children learning of children with ASD, PECS in English that enhances communication skills in children with ASD, and PECS in English enhances bilingualism amongst children with ASD. Findings for RQ2 are as follows: PECS in English is not appropriate for all kids, and PECS in English is not good for teamwork learning for kids with ASD who are of inferior status (Mohamad et al., 2022).

The number of children diagnosed with autism around the globe continues to rise each year. While these children should have equal opportunities for learning as any other, access to education can prove difficult. English language acquisition presents a particular challenge, yet proficiency has become essential in today's interconnected world. This paper explores the impact of the Picture Exchange Communication System

on the acquisition of English vocabulary as a second language, given its proven effectiveness for first language development. Employing a single-subject experimental A-B design with repeated measurement, the study involved two high-functioning autistic boys aged nine and twelve enrolled in a special needs school—the pre-treatment phase incorporated twenty-three sessions, followed by fifteen sessions during treatment. Visual analysis and graphical representation of the results indicate that both participants demonstrated improvement following the intervention. Furthermore, qualitative assessment of weekly session reports for each subject highlights difficulties encountered, such as lack of cooperation during phase two for one boy and lack of attention and cooperation midway through treatment, as well as proprioceptive and vestibular sensory processing problems for the other (Zohoorian et al., 2021).

The Santos et al. (2021) investigation aimed to determine how implementing the Picture Exchange Communication System affected how youngsters with autism spectrum disorder understood directives. This follow-up study explored twenty nonverbal kids with ASD ages six to twelve, fifteen boys and five girls, as evaluated and diagnosed by a multidisciplinary group using the DSM-5 criteria. Some children required multiple sessions to complete tasks while others grasped instructions more rapidly, showcasing the diverse range of abilities even within this narrow criterion. The researchers noted successes and setbacks in comprehending instructions with the PECS implementation, pointing toward interventions requiring customization to individual needs and ongoing evaluation of progress over time. The PECS Implementation Program employed eight visual and eight spoken instructions at two stages to assess understanding: early phases II and IV. The program included twenty-four individualized speech therapy sessions with a therapist present. It also involved twenty-four individual sessions with family and adhered to the original six steps. Compared to before, comprehension dramatically improved in all directions. the increase was remarkably significant for six oral instructions ($p = 0.001$) and five visual ones ($p = 0.002$). PECS positively affected grasping images and words, illustrating that the system not only gives an alternative means of communication but substantially enhances the uptake of situational facts.

Jamal (2020) found in his study that revealed the profound influence of autism spectrum disorder on the social growth and scholarly success of affected students. While students with ASD in the Kingdom of Saudi Arabia continue facing particular struggles,

including stigmatization and poor performance in their courses, the current research aims to boost children's communication by appying assistive technology and a Picture Exchange Communication System. In doing so, certain aspects of Australian inclusion practices will be adapted for Saudi Arabia's public schools. A systematic assessment uncovered five applicable studies published between 2010 and 2015 in peer-reviewed academic journals. Meanwhile, the Kingdom works to address the complications confronting its students with ASD, such as perceiving them differently or viewing their prospects for academic accomplishment as limited. The studies aimed to determine how Picture Exchange Communication Systems (PECS) and assistive technologies (AT) were employed in most inclusive Australian public schools. Different results were uncovered regarding the utilization of PECS and AT in the majority of inclusive public schools. Furthermore, the research observed high expectations for using PECS and AT within the environment of Australian inclusive public schools. This is because the policy landscape was not conducive to the proper execution and application of PECS and AT. There needed to be more adequately trained or experienced teachers and speech-language pathologists knowledgeable about PECS or AT. The implementation of PECS and AT could have been planned and carried out better. Many instructors held negative perspectives towards effectively applying PECS and AT to include children with autism spectrum disorder in public schools. Several barriers hindered access to support services. In addition, the study discovered that adopting PECS and AT in the Australian system had proven successful once issues with planning and implementing PECS and AT were addressed.

The researchers sought perspectives from experts in the field on the Picture Exchange Communication System. An online survey was conduct 120 professionals - 44 instructors and 76 counselors, mostly young adults with graduate degrees - who apply the method with youth suffering from autism. The practitioners rated their comprehension of Picture Exchange Communication System and prioritized the importance, pros, and problems involved in its usage. According to the professionals, the Picture Exchange Communication System proved intuitive to employ and conducive to fostering communicative abilities in children with autism spectrum disorder. They found, however, that it requires significant time investment. The study provides insight for refining techniques to more efficiently help these kids connect and express

themselves while respecting the constraints of modern intervention settings (Alsayedhassan et al., 2016).

The study conducted by Chaabane et al. (2009) investigated how mothers could teach their autistic sons, both elementary school-aged, to exchange distinctive images in order to request items using the picture exchange communication system (PECS). Generalization probes administered throughout the conditions were used to gauge each child's ability to command untrained objects. The results, obtained using a multiple baseline experimental design, indicated that parents successfully instructed the children to employ novel pictorial response forms. Both boys enhanced their skills when compelled to utilize replacement symbols without the corresponding symbol across all symbol types, including colors, shapes, and functions. The mothers felt a sense of pride in seeing their children's communication skills progress.

Charlop-Christy et al. (2002) conducted a thoughtful investigation into the Picture Exchange Communication System with three youths on the autism spectrum. Their thoughtful multiple baseline design allowed them to track PECS skills acquisition over time carefully. Not only did all three children satisfy the learning requirements of PECS, but striking verbal gains emerged across play and academic settings, too. Measurements revealed that increased social interaction and reduced challenging behaviors accompanied the growth of communication. Indeed, beneficial ancillary impacts came to light. The study is a compelling example of how assistive methods can support multifaceted development.

1.11 Trends emerged from previous studies

Previous research has shown the PECS program's usefulness in improving social, visual, and sensory communication in children with autism. This was validated by the professionals in charge of teaching autistic youngsters and their parents.

The professionals' views on the usefulness of the PECS program for children with autism were equally positive, although they believed it takes a long time to produce results.

The present research, like earlier ones, aims to assess the usefulness of the PECS program in improving social skills in autistic children. Furthermore, the studies found

no variations in the impact of the PECS program among autistic children based on age, marital status, gender, or severity of the illness, which will be determined by the current study.

1.12 Limitations of the study

The study limitations are as follows:

1. Sample size: The researcher included only 20 students to participate in this study. The 20 participants were divided into two groups, ten students in each one.
2. Gender: The researcher included only male children in this study. The researcher could not include female students due to some circumstances while conducting the study since the study sample was purposive.
3. Age: The study focuses on children aged 5-7 years old.
4. Geographic limitation: The study is conducted in one school in Jerusalem (Al-Sanabel Special Education School). So, the results may not be representative of all Palestinian autistic children.
5. Lack of randomization: The sample of this study is a purposive sample. This means that this study was conducted.

1.13 Definitions of key terms

Autism spectrum disorder: "Is a neurological condition in which a person's cognitive, social, and intellectual abilities are impaired." Each person, like with all spectrum diseases, may exhibit a variety of deficiencies with varying severity. Many students with autism spectrum disorder struggle with communicating in some way (Ousley & Cermak, 2014).

Picture Exchange Communication System: is an alternative communication system that helps children with autism spectrum disorders to communicate with others, such as by conveying requests, answering questions, making remarks, describing their surroundings, and so on. PECS stands for "alternative communication systems," which are designed to assist children with poor communication abilities to learn how to communicate. Children utilize the objects printed on the cards to communicate in this system. Mastering the PECS system entails teaching a child with autism spectrum disorder how to ask for the desired item using a symbol (an image on a card with the proper caption) (Lesser & Ebert, 2020).

Improvements to the PECS Alternative Communication System:

- Maintaining eye contact.
- Ability to concentrate.
- Flexible thinking.
- Memorizing names of objects.
- Readiness to receive information.
- Ability to communicate.

Sensory integration: The training system reproduces the result of the brain's signal-receiving from the internal and external environment. Maintaining the brain to respond appropriately to the stimuli from the outside is the immediate goal of this kind of training. At the same time, various types of equipment, such as swings, balance platforms, huge balls and rollers, skateboards, and others are used (Zimmer et al., 2012).

Sign language: In the preschool classroom, another nonverbal communication system was implemented. To help nonverbal pupils understand words and concepts, sign language is utilized as an augmentative communication technology. They frequently learn several simple hand gestures to help teachers and students communicate more effectively regularly. Finally, video modeling involves brief video clips of specific children doing daily academic and interpersonal duties correctly or wrongly (Drozdiel, 2012).

A therapeutic program is described as "a scheduled sequence of future components, products, concepts, or activities related to the treatment of illnesses or disorders." The goal of therapeutic programs is to help individuals with a range of psychological disorders, from depression to drug addiction (Amieva et al., 2016).

Verbal communication: it is a type of communication that refers to conveying a message through spoken or written forms. It might be done through face-to-face conversation, phone calls, emails, texts, or any other form that is based on the language (De Saussure & Rocci, 2016).

Non-verbal communication: it is a type of communication that refers to conveying messages through means that are not words or written. It usually happens through facial

expressions, body language, gestures, tone of voice, touch, eye contact, posture, and silence (Anderson, 2006).

1.14 Statement of the problem

Many children diagnosed with autism suffer from being unable to communicate their needs and preferences verbally, thus limiting their social interaction and integration, which leaves much pressure on the children and concern for parents. PECS provides a chance to gradually encourage children to communicate verbally. After reviewing previous studies, the researcher found shortcomings in the treatment program PECS, especially in the applied cases that may have targeted areas of the West Bank but did not include Jerusalem. Equally important, according to the researcher's work experience during 2018 and 2019, the researcher worked at a private school for autistic children. The researcher tried to integrate with the world of autistic children and noticed the difficulty of social interaction and adapting to different emotional states. The researcher finds them unable to stay in new or noisy places, have difficulty in verbal, non-verbal, and social communication, and they are experiencing situations that make them cry or laugh for reasons that are not understood by other people around them. Thus, this research will undertake a field study in two Palestinian preschools to examine the effect of applying the PECS program on students' ability to improve their conversation skills and verbally express.

The problem is defined in the following main question:

How effective is PECS treatment program in developing Communicative skills?

To investigate this issue sufficiently, the researcher divided the main question into the following sub-questions:

Thesis Sub-questions

The first question: What are the levels of communication skills among Palestinian autistic children?

The second question: Are the means of communication talents in the pre-analysis and post-analysis for the experimental cluster among autistic children substantially diversified?

The third question

Are the means of communication expertise between preliminary and subsequent evaluation substantially variant for the experimental team of autistic children according to group type, age, autism level, residency in the school?

1.15 Objectives

The researcher explains the objectives of the thesis after defining the problem:

1. This study aims to reveal the levels of communication skills among Palestinian autistic children.

2. This study aims to identify the communication skills in the pre and post-test among autistic children.

3. his study aims to identify the communication expertise between preliminary and subsequent evaluation substantially variant for the experimental team of autistic children according to group type, age, autism level, residency in the school.

1.16 Significant of thesis:

This study draws its significance from several crucial point.

1.17 Theoretical importance

The research contributes to providing a theoretical framework for researchers, in addition to shedding light on a specific category of autistic children through the (Effectiveness of the Picture Exchange Communication System (PECS) Program) program, to show its effect on improving social skills for this group.

1.18 Practical importance

The researcher believes that the application of the Picture Exchange Communication System (PECS) program improves the social skills of autistic children, in addition to the benefit that accrues to workers in the education sector.

By following the autistic children's steps, and interacting positively with their communication, teachers tend to establish warming and positive environment for them (Zhao & Chen, 2018). Therefore, ASD PECS is expected to improve student

interpersonal interactions, minimize tantrums and frustrations, and allow students to self-regulate some of their social conduct (Drozdiel, 2012).

Picture Use and Speech Acquisition as the main goals of PECS will positively reflect on the children's skills evolvement, as spontaneous communication abilities are an important feature of PECS. We see several children begin to speak without any direct formal speech instruction during the first few months of applying to the PECS program for young children with autism (Bondy & Frost, 1994).

1.19 Study hypotheses

1. There are statistically significant levels of the communication skills of Palestinian autistic children at the significance level ($\alpha \leq 0.05$).

2. There are statistically significant differences between the means of communication skills of the pre-test and post-test in the experimental group at level ($\alpha \leq 0.05$).

3. There are statistically significant differences between the means of the communication skills in the post-test based on the group type, age, the level of autism, residency in the school, and the presence of another disability at the significance level ($\alpha \leq 0.05$).

Chapter Two

Research Methodology

This particular chapter outlines the various processes and methodologies applied within the current research and examination. It illustrates the investigation structure, involved participants, and chosen sampling method. Furthermore, a portrayal of the assessment device used for information assortment and its psychometric attributes are featured. The chapter additionally incorporates a condensed outline of the gathering remedial meeting arrangements, the factual investigation strategies taken, and the fluctuating classifications considered. New information and understandings were gained throughout the process regarding both complexity and variation in expression.

2.1 Study Design

The current inquiry employed a quasi-experimental design with matched pretest-posttest experimental and control groups. This method was used to analyze the impact of the independent variable—a Picture Exchange Communication System program—on autistic children's dependent variable of communication competencies. Two equivalent groups, one receiving the intervention and one not, were established. Specifically, the PECS program was administered solely to the experimental participants. Meanwhile, the control participants received no treatment. Both cohorts undertook pre- and post-testing to gauge communicative skills before and following the therapeutic regimen. Performance results were then contrasted and inspected; this study structure is symbolically portrayed by the following.

$$\begin{matrix} \mathbf{G_{exp}} & \mathbf{O_{pre\text{-}exp}} & \mathbf{X} & \mathbf{O_{post\text{-}exp}} \\ \mathbf{G_{con}} & \mathbf{O_{pre\text{-}con}} & \mathbf{----} & \mathbf{O_{post\text{-}con}} \end{matrix} \qquad \text{……..(1)}$$

Where the symbols refer to:

G_{exp}: The experimental group received a Picture Exchange Communication System group program.

G_{con}: The control group that did not receive any intervention.

$O_{pre\text{-}exp}$: Pre-test of the dependent variable of communication skills for the experimental group members.

$O_{pre\text{-}con}$: Pre-test of the dependent variable of communication skills for the control group members.

X: The experimental intervention represented by a Picture Exchange Communication System group program that the experimental group received.

$O_{post\text{-}exp}$: Post-test of the dependent variable of communication skills for the experimental group members.

$O_{post\text{-}con}$: Post-test of the dependent variable of communication skills for the control group members.

2.2 Study Population

The varied population examined in this research encompassed all individuals residing in Palestinian territories diagnosed along the autism spectrum; however, definitive statistical data from official Palestinian sources quantifying both the young and adult residents impacted by autism nonexistent, with informal approximations instead placing the approximate figure at around five thousand citizens according to estimates (Baker et al., 2021).

2.3 Sampling and Sample Size

A majority of autistic children relegated to special education classrooms in Palestine are males, following trends echoed throughout the world. Global prevalence demonstrates diagnoses distributed unevenly between genders - approximately four males are diagnosed for every female. Therefore, this study focused solely on males, deliberately selecting 20 from Al-Sanabel, a Jerusalem school. Ten comprised the experimental group and ten the control, all meeting prerequisites confirmed autism diagnosis. The study aims to enhance social skills; researchers will compare engagement, relationships, and behaviors before and after applying a specialized curriculum. Though the sample size is small, this study may indicate intercessions empowering fuller inclusion and independence. Much remains to unravel regarding autism and pedagogy; collectively, we seek answers through respect, understanding, and shared commitment to each person's humanity. The inclusion criteria for selecting children were:

- Children who were already diagnosed with a ASD according to DSM-5 criteria.
- Children whose ages ranged from (5 to 7) years old.

- Children who do not have either mental disability or who demonstrated comorbidities such as epilepsy.
- Children whose parents have agreed to consent.

The following table shows the description of participants in light of some categorical variables.

Table 3

Participants' description (n = 10)

Group Type	Demographic Variables		Frequency	Percentage
Experimental	Age	5 years old	4	40%
		6 years old	3	30%
		7 years old	3	30%
		Total	10	100%
	Autism level	Mild	3	30%
		Moderate	3	30%
		Severe	4	40%
		Total	10	100%
	Residency in the school	< 6 months	3	30%
		≥ 6 months	7	70%
		Total	10	100%
	Presence of another disability in the home	Yes	5	50%
		No	5	50%
		Total	10	100%
Control	Age	5 years old	3	30%
		6 years old	4	40%
		7 years old	3	30%
		Total	10	100%
	Autism level	Mild	3	30%
		Moderate	3	30%
		Severe	4	40%
		Total	10	100%
	Residency in the school	< 6 months	3	30%
		≥ 6 months	6	60%
		Total	10	100%
	Presence of another disability in the home	Yes	4	40%
		No	6	60%
		Total	10	100%

2.4 Instrumentation

According to Ameen (2013), the autistic children's Communication Skills Scale [SCSS] for is an assessment developed in Egypt and provided to the participants' educators. This evaluation was designed to gauge verbal, nonverbal, and social abilities among autistic kids ranging from 5 to 12 years old. It incorporates 36 five-point Likert scale statements (constantly rates as 4, generally as 3, occasionally as 2, scarcely as 1, and never as 0), with items 21 and 27 scored in reverse (constantly rates as 0, generally as 1, occasionally as 2, scarcely as 3, and never as 4). The scale contained intricate and variable sentences to appraise nuanced communication skills in functional and fragmented expressions. The subscales are:

- The verbal communication skills subscale [VCSS] consisted of (12) items: 1, 4, 7, 10, 13, 16, 19, 22, 25, 28, 31, and 34.
- The nonverbal communication skills subscale [NVCSS] consisted of (12) items: 2, 5, 8, 11, 14, 17, 20, 23, 26, 29, 32, and 35.
- The social communication skills subscale [SCSS] consisted of (12) items: 3, 6, 9, 12, 15, 18, 21, 24, 27, 30, 33, and 36.

According to Ameen (2013) the SCSS has good psychometric properties. VCSS, NVCSS, and SCSS correlated significantly with SCSS total score with coefficients of.624,.549, and.603 respectively. The internal consistency by Cronbach's alpha was.829 for the total score and for VCSS, NVCSS, and SCSS they were.811,.793, and.805 respectively.

2.5 The SCSS validity

The current study assessed the SCSS by judge's validity. The scale was reviewed by six experts in the department of psychology and counseling at ANNU. The judges suggested rephrasing some unclear items and to paraphrase some text to be more understandable for autistic children’s teachers. In addition, no item was eliminated based on the judges' recommendations; therefore, the SCSS has kept all the scale items.

Furthermore, the validity of the SCSS was evaluated in this study using a method of construct validity. The corrected item-total correlations (CITCs) were calculated by administering the SCSS to an exploratory sample of thirty-four teachers working with autistic children at special education centers, including the Autistic Child Care

Organization in Jerusalem, Alpha Center in Ramallah, and the Child Development Clinic at An-Najah National University in Nablus. The teachers provided their perspectives on the autistic students' social communication behaviors and severity of deficiencies. The results from this diverse sample of education professionals helped confirm that the assessment tool effectively measures the targeted construct with a good amount of dependability between items.

The Pearson correlation coefficients calculated between each item, subscale, and total score showed that all items significantly correlated with the overall results and their relevant subsections. Item correlations with the total ranged from 38 to 76, while intercorrelations with associated subscales ranged from 41 to 87. Subscale correlations with the SCSS were 65 for VCSS,.77 for NVCSS, and.69 for SCSS, indicating sufficient construct validity of the measurement tool. The scale adequately gauges what it aims to assess, as evidenced by retaining all questions. As seen in the table below, CITC results for the SCSS support its ability to appraise the underlying latent variable intended to be quantified.

Table 4

The construct validity of the SCSS (n = 34)

#	C.O. with VCSS	C.O. with SCSS	#	C.O. with NVCSS	C.O. with SCSS	#	C.O. with SCSS	C.O. with SCSS
1	.602**	.574**	2	.666**	.534**	3	.531**	.443**
4	.589**	.548**	5	.624**	.509**	6	.666**	.635**
7	.714**	.672**	8	.451**	.384**	9	.804**	.720**
10	.851**	.609**	11	.602**	.536**	12	.821**	.688**
13	.789**	.664**	14	.597**	.502**	15	.689**	.445**
16	.728**	.622**	17	.444**	.392**	18	.639**	.477**
19	.691**	.572**	20	.716**	.687**	21	.789**	.683**
22	.866**	.738**	23	.501**	.388**	24	.762**	.611**
25	.409**	.605**	26	.597**	.452**	27	.827**	.758**
28	.759**	.686**	29	.633**	.472**	30	.637**	.554**
31	.799**	.721**	32	.691**	.597**	33	.669**	.566**
34	.658**	.504**	35	.644**	.511**	36	.578**	.420**
VCSS with SCSS		.648**	NVCSS with SCSS		.773**	SCSS with SCSS		.687**

**(p <.01). C.O.: Correlation Coefficient 65,.77, and.69

2.6 The SCSS reliability

Current research explores the SCSS's internal consistency reliability through Cronbach's Alpha, yielding a total coefficient of. 967 excellent reliability. The VCSS, NVCSS, and SCSS coefficients were. 936,.953 and. 870, respectively, indicating that each subscale reliably measures a distinct construct. A treatment study applied PECS in a group format for nonverbal youth with autism.

2.7 General objective of the PECS program

The PECS program aimed to acquire and improve communication skills among autistic children, to be able to understand and express their needs, feelings, and desires. The following sub- objective branch out from the main objective and that aim to help autistic children to:

1. Form a sound and understandable sentence.
2. Express their daily basic needs.
3. Recognize and distinguish the desired types of food.
4. Express their desire to play and distinguish between some figures.
5. Match pictures with similar objects.
6. Express their different feelings, emotions, and ideas.
7. Acquire the skills of distinguishing and naming the human body parts.
8. Understand and name daily things and activities.
9. Acquire the skills of relationships between things.

2.8 PECS therapeutic group program techniques

The foundation of the PECS is that learning is a result of the circumstances surrounding a specific behavior. Therefore, people may desire something as a result of a superintendence. Thus, if an action does not result in a desired outcome, it will not reappear. When autistic kids utilize the image cards in PECS, they get the item or activity they requested as a reward. Consequently, PECS is predicated on rewarding autistic youngsters for their actions. Consequently, it raises the possibility that kids may continue to use the cards to express their needs and desires.

Since it's a communication tool, PECS is taught and utilized on a regular basis. Initially, the PECS trainer—who may be a parent or teacher—focuses on the child's preferred

meals, toys, or other daily activities. A child is taught by the trainer to swap these objects' photographs with their real counterparts. Afterwards, the child may use the cards to do activities like these, ask and receive inquiries, and request items or supplies. The child progresses from trading single cards to utilizing many cards at once to form brief conversations. Accordingly, techniques of modeling and imitation, repetition, learning different life skills, reward and reinforcement are employed in PECS.

2.9 The importance of therapeutic group program

As a result of PECS, autistic children can interact with others in an efficient manner. PECS is helpful for kids who do not have a feasible communication system at home, neither in their official learning environment, their school. It is noted that these children are mostly non-verbal or speak incoherently or with limited vocabulary. PECS can be employed to help with people of all ages, offering a wide range of communication, cognitive, and physical problems, PECS has proven effective. Some PECS users will eventually acquire the ability to speak (Gilroy et al., 2018).

2.10 PECS timeframe

The program was implemented over two sessions per week, on Sundays and Thursdays, and the total number of sessions was (10) sessions, and each session lasted (30-40) minutes, and the program lasted about two months.

2.11 Place and Tools

The PECS program was conducted at Al-Sanabel special education school in Jerusalem. In addition, LCD, laptop, pens, pencils, coloring pen, PECS cards, and some gifts.

2.12 Content of the PECS group program

The following table displays the content of the ten-session Picture Exchange Communication System group program that was applied to the experimental group:

Table 5

The content of the ten-session PECS group program

Session number	Session objectives	Session duration
The first session	● Conducting the pre-test on the autistic children's teachers. ● Achieving intimacy and acceptance among the autistic children each other and with the researcher in the presence of their teacher in the classroom. ● Achieving autistic children's ability to involve and engage with each other and introduce themselves by forming a sentence of at least 3 words.	30 minutes
The second session	● Express the autistic children's daily basic needs.	40 minutes
The third session	● Recognize and distinguish the desired types of food for the autistic children.	40 minutes
The fourth session	● Express the autistic children their desire to play and distinguish between some figures.	40 minutes
The fifth session	● Help the autistic children to match pictures with similar objects	40 minutes
The sixth session	● Help the autistic children to express their different feelings, emotions, and ideas	40 minutes
The seventh session	● Help the autistic children to acquire the skills of distinguishing and naming the human body parts.	40 minutes
The eighth session	● Understand and name daily things and activities among the autistic children.	40 minutes
The ninth session	● Acquire the skills of relationships between things.	40 minutes
The tenth session	● Reinforcing and thanking the children, distributing some gifts to them, and ending the training program. ● Conducting the post-test on the autistic children's teachers.	30 minutes

2.13 The Study Procedures

- The following procedures were undertaken in order to meet the aims of this study:
- Theoretical framework and analyzing prior related studies to the current study variables (Autism, communication skills, PECS program and group therapy).
- Developing SCSS and PECS-based therapeutic group program study instruments
- The validity and reliability of SCSS was tested by administering SCSS to teachers of autistic children (experimental and control groups).
- Determine study sampling method (purposive sample) choose diagnostic criteria autism spectrum disorder autistic children you are taking part. Moreover, the communication skills of the autistic children were pre-tested.
- The PECS group program, the informed consent was given to the parents of the children in order to grant permission. The families all said yes and welcomed their children into the program. Giving us (10) autistic children as a sample.
- Distributing the participants to the two study groups (10 in the experimental group and 10 in the control group) by utilizing an equivalent group design by the matching with respect to the age and autism level variables.
- The autistic children in the experimental group received the PECS group program, and the participants in the control group did not have any therapeutic intervention.
- The post-tests were performed on the children of autistic children in the experimental and control groups, after the PECS group program.
- Inputting the data into the computer and carrying out the statistical analysis through the Statistical Analysis Program (SPSS).
- Deriving the outputs from them, discussing the outputs from them, and giving recommendations on basis of the outputs from them.

2.13 The Statistical Analysis

The data was collected, and then all the data were entered into SPSS software, and the following statistics were used:

- Descriptive analysis of the study variables (frequencies, percentages, means, and standard deviations).
- The study variables were validated using the Pearson Product-Moment Correlation Coefficient.

- The study variables were disclosed with the help of the Chronbach Alpha equation.
- Shapiro-Wilk Test was used to assess the normality of the study variables since this test was used with small samples (less than 30).
- An independent samples t-test was conducted to verify the mean difference of depression and perceived self-efficacy scores between both pre-test groups.
- A paired samples t-test was used to estimate the mean difference in total communication skills score and sub-scores from pre-test to post-test for the experimental group.
- Five-way MANCOVA was used to study the differences in communication skills in the post-test based on the pre-test, group type, age, autism and other disability degree of severity, and school residency.
- The study of Rosenthal et al. (1994) used the effect size to study the PECS group program's effect on communication skills and VCSS, NVCSS, and SCSS domains.

2.14 Study Variables

a. Independent variables: The PECS group program served as the independent variable, as the experimental group received the intervention while the control group received no intervention. Lastly, the independent variables included age, autism level, residential status in the school, and Presence of additional disability.
b. Dependent variables: The variables were the communication skills and their domains.

2.15 The Equivalence of the Two Study Groups

The equivalence of the two groups was verified in the pre-tests in terms of the communication skills displayed before the results of the study were obtained. In addition, in the pre-tests researcher examined the normality conditions of communication skills and their domains for both groups to use appropriate statistical tests. Parametric tests are the optimal statistical tests when data follows the normal distribution, while if data does not follow the normal distribution, non-parametric tests are an appropriate choice (Verma & Abdel-Salam, 2019). Moreover, the Shapiro–Wilk S-W test is proper and will be used for normality in the case of a sample size of less than 30 individuals (Field, 2013), and the following table illustrates the results of the Shapiro–Wilk test.

Table 6

Testing the normality of the responses in communication skills and its domains for both groups in the pre-tests by the Shapiro-Wilk test

Group type	Dependent variables	Shapiro-Wilk test		
		Statistic	df	Sig.
Control (n = 10)	VCSS	.961	9	.792
	NVCSS	.960	9	.784
	SCSS	.907	9	.262
	SCSS	.963	9	.820
Experimental (n= 10)	VCSS	.832	9	.052
	NVCSS	.868	9	.118
	SCSS	.871	9	.127
	SCSS	.939	9	.572

Lastly, the pre-tests indicated that for both groups the results were evenly distributed regarding communication skills and domains as shown in table 6. Where none of the values for Shapiro–Wilk test statistic were significant (p >. 05), thus in the case of parametric statistical methods, the following table presents the results of testing the differences between means to examine the equality of the two groups in the communication skills and its domains in the pre-tests, by independent samples t-test, the result shown in the following table.

Table 7

Means, standard deviations and the results of the independent sample t-Test of the communication skills and its domains for both groups in the pre-tests

Dependent variables	Con. group (n = 10)		Exp. group (n = 10)		df	T-value	Sig.
	Mean	S.D.	Mean	S.D.			
VCSS	1.05	0.39	0.74	0.77	18	-1.13	.273
NVCSS	1.63	0.43	1.39	0.69	18	-0.941	.360
SCSS	1.75	0.22	1.45	0.98	18	-0.961	.372
SCSS	1.27	0.15	1.21	0.72	18	-0.254	.803

As presented in table (7), the mean of SCSS in pre-test in control group (1.27) with standard deviation of (0.15). although, in the experimental group (1.21) and standard deviation (0.72). There was no significant difference between the two means (t = -0.254, p >.05), and the difference in SCSS in the pre-test was not significant between groups.

The results showed that in terms of the mean value of VCSS in the control group, a pre-test was (1.05) and the standard deviation was (0.39), whereas in the experimental group, a pre-test was (0.74) and the standard deviation was (0.77). Results showed that the difference between the two means was insignificant (t = -1.13, p >.05) VCSS in the pre-test is no different between the two groups (p = 0. Also, the average NVCSS in the pre-test in the control group (M=1.63, SD=0.43) was higher than in the experimental group (M=1.39, SD=0.69). There was no significant difference between the means of the two (t = -0.941, p >. 05), which means that there was no difference between the groups in NVCSS in the pre-test. In the pre-test in the control group, the mean of SCSS was (1.75) with a standard deviation of (0.22). In the experimental group, SCSS had a mean of (1.45) with a standard deviation of (0.98). The difference in means between the two was insignificant (t = -0.961, p >. 05), suggesting no difference between the groups in SCSS at pre-test.

All results indicate to availability of the equivalence of the two groups before the intervention.

Chapter Three

The Results

This research aimed to examine the efficacy of implementing the Picture Exchange Communication System program groupwise at the Sanibel Special Education School in Jerusalem for enhancing communicative abilities among autistic youngsters. In addition, this study sought to assess the effect of factors such as age, autism severity rating, length of enrollment at the institution, and comorbid conditions on communication progress. Thus, this chapter addressed queries concerning the goals above by analyzing variations in the efficacy of implementing the Picture Exchange Communication System program groupwise.

3.1 The First Question's Results

What are the levels of communication skills among Palestinian autistic children?

To answer this question and to discover the position of Palestinian autistic children in communication skills on the pre-test for both groups, the researcher compared the communication skills and its domains with appropriate cut point value, based on the mid-point between the minimum and the maximum values. To test the difference between the sample score and its cut point value, which represents the hypothetical mean, the researcher used a one-sample t-test with a cut point value of (2). The table below shows the result.

Table 8

Results of one sample t-test for the difference between the communication skills sample mean and the hypothetical mean (cut point = 2)

Variables	Mean	Standard deviation	T value	d.f.	Sig.
VCSS	0.89	0.61	-8.03	19	.000**
NVCSS	1.52	0.56	-3.73	19	.002**
SCSS	1.60	0.71	-2.50	19	.020*
SCSS	1.24	0.51	-6.71	19	.000**

**(p <.01), *(p <.05).

As illustrated in the table above, the result indicates that there is a negative significant difference (p <.01) between the SCSS sample mean (1.24 ± 0.51) and the hypothetical mean (cut point = 2), in favor of the hypothetical mean (t = -6.71, p <.01). In other

words, there is a low level of communication skills among Palestinian autistic children. Also, there is a negative significant difference ($p < .01$) between the VCSS sample mean (0.89 ± 0.61) and the hypothetical mean, in favor of the hypothetical mean ($t = -8.03$, $p < .01$), which indicated to low level of verbal communication skills among Palestinian autistic children. In addition, there is a negative significant difference ($p < .01$) between the NVCSS sample mean (1.52 ± 0.56) and the hypothetical mean, in favor of the hypothetical mean ($t = -3.73$, $p < .05$), which indicated to low level of nonverbal communication skills among Palestinian autistic children.

Finally, there is a negative significant difference ($p < .01$) between the SCSS sample mean (1.60 ± 0.71) and the hypothetical mean, in favor of the hypothetical mean ($t = -2.50$, $p < .05$), which indicated to low level of social communication skills among Palestinian autistic children.

3.2 The Results of the Second Question

"Are there significant differences between the pre-test and post-test assessment in the experimental group of autistic children substantially different?

Determination of the statistical test that must be used before answering this question Since this study sample ($n = 20$ and less than 30) was small, this information needs to be known beforehand since this information is based on what was reported by Field (2013). A normality test of the responses in communication skills and its domains in the pre-test and post-test for the experimental (receiving intervention) group, was conducted to select the correct statistical methods. Here are the results, specified in the table below.

Table 9

Testing the normality of the responses in communication skills in the pre-test and post-test for the experimental group by the Shapiro-Wilk test (n = 10)

Group type	Dependent variables	Shapiro-Wilk test		
		Statistic	df	Sig.
Pre-test (n = 10)	VCSS	.832	9	.052
	NVCSS	.868	9	.118
	SCSS	.871	9	.127
	SCSS	.939	9	.572
Post-test (n= 10)	VCSS	.873	9	.057
	NVCSS	.909	9	.271
	SCSS	.885	9	.150
	SCSS	.926	9	.412

Pre-and Post-test Distribution of the Experimental Group Communication Skills and Domains as illustrated in the above table, the experimental group responses to the pre-test and post-test communication skills and domains were evenly distributed. The statistical values of the Shapiro-Wilk test were insignificant (p >.05). Given that the symptomatic scores are normal, parametric statistical methods are applicable in this case. The differences between means and standard deviations were computed for the experimental group's communication skills compared to the pre-test and post-test, and the following table reports on these.

Table 10

Means and standard deviations of in communication skills for the pre-test and post-test of the experimental group (n = 10)

Dependent variables	Pre-test (n = 10)		Post-test (n = 10)	
	Mean	S.D.	Mean	S.D.
VCSS	0.74	0.77	2.03	1.07
NVCSS	1.39	0.69	2.58	0.52
SCSS	1.45	0.98	3.04	0.60
SCSS	1.21	0.72	2.55	0.67

The difference across the means of domain types of communication skills is a significant difference between the means of types of communication skills by measuring

type in the experimental group in the following table. The mean SCSS in the pre-test was (1.21) with a standard deviation of (0.72), then, in the post-test, it was (2.55) with a standard deviation of (0.67). However, the pre-test means and standard deviation of the communication skills subscales in the experimental group were 0.74 ± 0.77, 1.39 ± 0.69, and 1.45 ± 0.98 for VCSS, NVCSS, and SCSS, respectively. They were post-test, 2.03 ± 1.07, 2.58 ± 0.52, and 3.04 ±the 0.60, respectively, for VCSS, NVCSS, and SCSS.

According to measuring type (pre-test and post-test), the researcher used a paired-sample t-test to test the differences between these means. However, the SPSS software does not provide the choice of effect size calculation of paired samples t-test. Hence, it was determined manually based on the equation formed by Rosenthal et al. (1994).

Effect size for Paired Sample t-Test = $Mean_D$/ SD_D

That is, dividing the meaning of the differences by the standard deviation of these differences. Show Table 11 in Appendix F.

The difference of the two communication skills mean for the experimental group on the pre-test (M = 1.21, S.D. = 0.72) and post-test (M = 2.55, S.D. = 0.67) was significant (t = -11.88, p <. 01) favor to the post-test where the level of communication skills of autistic children significantly increased after the application of the PECS group program. The effect size of the PECS group program was (3.72) which according to Klappa (2019) indicates a large effect size, meaning that there is a high level of effectiveness of the PECS group program regarding the improvement of communication skills of autistic children.

The difference between the two means of VCSS, NVCSS, and SCSS in the pre-test (M = 0.74 ± 0.77, 1.39 ± 0.69, and 1.45 ± 0.98 respectively) and post-test (M = 2.03 ± 1.07, 2.58 ± 0.52, and 3.04 ± 0.60 respectively) for the experimental group were significant (t = -4.91, p <.01, t = -8.63, p <.01, and t = -9.17, p <.01 respectively) in favor to the post-test where the verbal, nonverbal, and social communication skills levels among autistic children increased significantly after the intervention by the PECS group program. The effect sizes of the PECS group program for VCSS, NVCSS, and SCSS were (1.55, 2.87, and 2.92 respectively) which are considered big effect sizes according to Klappa (2019)

which in turn indicated the effectiveness of the PECS group program in improving the verbal, nonverbal, and social communication skills among autistic children.

3.3 The Results of the Third Question

This question states, "Are there significant differences between the means of communication skills in the post-test according to group type, age, autism level, residency in the school, and presence of another disability among autistic children?

Before answering this question, a statistical test to be used since the study sample is small (n=10 and less than 30) was determined. Furthermore, in determining the appropriate statistical methods to be used, the normality of communication skills and its domain responses for both groups at the post-test was assessed (Field, 2013). This is what the results looked like in the table 12 in Appendix F.

The previous table illustrates a general distribution of responses in communication skills and domains for the post-test between the two groups. The Shapiro-Wilk test showed all statistic values as non-significant (p >. 03); therefore, parametric statistical methods apply.

The means and standard deviations of communication skills and their domains in the post-test were calculated according to group type, age, autism level, whether the child was resident in the school and whether there was another disability among the autistic children and were summarized in the following table 13 in Appendix F.

Apparent differences were identified for communication and in-post-test domain means by group type, age, autism level, residential status in school and presence of an additional disability, as shown in the table above. To examine differences in the post-test by group type, age, autism level, school residency, and other disability, a five-way MANCOVA controlling for pre-test and post-test was implemented. In addition, effect sizes for independent variables were computed, and the results are presented in the table 14 in Appendix F.

Post-test results, displayed in the above table, show that there were significant mean differences for ACCSS, VCSS, NVCSS, and SCSS by group type post-test favoring the experimental group (F = 46.49, p <. 01, F = 9.25, p <. 05, F = 28.37, p <. 01, F = 42.26, p <. 01, and F = 46.49, p <. 01 ") and effect sizes of (0.869, 0.569, 0.802, and 0.858) are

considered large effect sizes by Klappa(Klappa, 2019) which in turn indicated to the effectiveness of PECS group program for facilitating communication skills among the autistic children in the experimental group compared with control group (see Table 11).

On the other hand, there is a significant difference in VCSS means according to age in the post-test in favor to five years old group ($F = 5.16$, $p < 0.05$) with an effect size of (0.596) which is considered a moderate effect size which in turn indicated younger autistic children benefited from PECS group program more than others age groups (see Table 11). Meanwhile, there are insignificant differences in ACCSS, NVCSS, and SCSS means according to age in the post-test ($F = 2.13$, $p > 0.05$, $F = 1.38$, > 0.05, and $F = 0.092$, $p > 0.05$ respectively). Furthermore, there are unsignificant differences in ACCSS means according to autism level, residency in the school, and presence of another disability in the post-test ($F = 0.686$, $p > 0.05$, $F = 0.001$, > 0.05, and $F = 2.41$, $p > 0.05$ respectively).

For the covariate of pre-test scores in the model against post-test scores of ACCSS, the results indicated that pre-test scores did not significantly affect ACCSS post-test scores ($F = 0.130$, $p > 0.05$), indicating the PECS group program effect on communication skills levels change in post-test.

Chapter Four

Discussion and Recommendations

This chapter explores the results found in this study and proposes a group of recommendations. The study aims to investigate PECS's ability to improve communication skills among autistic children in Jerusalem. Thus, within a supportive and encouraging environment, the researcher used PECS as an alternative communication tool and an essential tool in this treatment approach to help children with verbal obstacles.

4.1 Discussing the first sub-questions results

The first research question aimed to study the levels of communication skills among Palestinian autistic children. The results showed that there are low levels of communication skills, verbal, nonverbal, and social communication skills among the sample of autistic children.

The question reads, "What are the levels of communication skills among Palestinian autistic children?"

The researcher did a pre-test and a post-test for a group of autistic children, employing equivalent groups (an experimental group and a control group) based on a mid-point between minimum and maximum levels. The differences between midpoints are tested via samples (t-tests). The study examined the effect of age, autism level, school residence, and the presence of other disabilities on lowering the verbal and non-verbal communication skills of Palestinian autistic children. As a result, a significant negative difference is found between the t-test mean and the hypothetical mean in favor of the hypothetical one.

The findings align with previous research, such as Drozdiel (2012), which noted that many children diagnosed with autism do not speak even though they have the ability to do so. Children who are diagnosed with autism face this difficulty due to the anxiety or embarrassment of joining conversations. Additionally, the researcher found that students suffer from low communication abilities. This result of low communication abilities is also in line with Faras et al. (2010) whose research concluded that late or nonverbal communication is a hallmark sign of autism.

Proving that many children diagnosed with autism do not speak even though they have the ability to speak, knowing that autistic children may be anxious and embarrassed to join a conversation. The previously mentioned study has also proven their low ability to communicate. Faras et al. (2010) summarize that late or nonverbal communication is a sign of autism. Hence, since autistic children struggle to communicate nonverbally and in the absence of reactions and facial and emotional responses, they have weak verbal and nonverbal communication skills.

4.2 Discussing the second sub-question results

The question reads, "Are there significant differences between the means of communication skills in the pre-test and post-test in the experimental group among autistic children?

The second research question investigated differences in communication skills between pre-test and post-test scores for the experimental group receiving the PECS intervention. The results showed that there is a significant improvement in communication skills, verbal, nonverbal, and social communication domains among the children who received the PECS intervention.

The results indicated a significant improvement in communication skills for autistic children in the post-test after using PECS. As the improvements were noticed in verbal, nonverbal, and social communication amongst the children, some differences with statistical indicators were seen in the experimental group. It is crucial to point out that, unlike the control group, the experimental group has had the opportunity to practice using PECS, which appears in the results mentioned earlier. The control group could not paraphrase a sentence or develop the skills the experimental group had developed. The outcome of this question is discussed in Consuelo (2018) research. Development Areas, News and Novelties, Types of Disorder which concludes a similar result assuring that PECS is a significant factor in teaching communication skills to children with communication challenges, enhancing their language, building positive social practices, and limiting the negative ones.

The large effect sizes ranging from 1.55 to 3.72 show that the PECS intervention had a positive impact on the children's communication abilities. For this finding, it is important to note here that it is a short intervention duration (10 sessions over two

months). The improvements were seen in social communication skills (effect size = 2.92) and communication skills (effect size = 3.72). Based on these results, the study concludes that the PECS effectively enhances broader communicative competence beyond verbal abilities.

Furthermore, the results of this study are like previous research completed by Consuelo (2018), also demonstrated that the PECS is important and effective in teaching communication skills to children with communication challenges. Our study and Consuelo's (2018) study also found that the PECS can improve children's language, build positive social skills, and reduce negative behaviors.

4.3 Discussing the third sub-question results

In the third question, the researcher explored differences in post-test communication skills based on group type, age, autism level, residency in the school, and presence of another disability, and the results showed important findings. The third question is:

The question reads, "Are there significant differences between the means of communication skills in the post-test according to group type, age, autism level, residency in the school, and presence of another disability among autistic children?"

The results indicate obvious statistical differences between the tools and field of communication in relation to group type, age, autism level, school residency, and the presence of other disabilities within autistic children's families. Thus, in accordance with the group's type in the post-test, the results came in favour of the experimental group, which indicated PECS's effectiveness in improving communication results for autistic children. The age group showed that there were significant differences in all communication domains favoring the experimental group; the large effect sizes ranged from.569 to.869.

The pre-test score did not significantly affect the post-test score, indicating that the change in results regarding communication skills occurred after the post-test and after using PECS. Early intervention using PECS significantly helps autistic children, and this is reflected when comparing the pre and post-test results among children of five years of age.

This study found a significant difference in verbal communication skills (VCSS) based on age. The 5-year-old group showed the greatest improvement. This previous finding supports the importance of early intervention. In this respect, our study results are in line with those of Elder and Paul (2008). Their study concluded that younger children may be more responsive to PECS due to greater neural plasticity and fewer ingrained communication patterns.

Hence, the effect level reflected on the post-test is moderate, meaning that younger children benefited more from using PECS. According to Elder and Paul (2008), these results are similar to those found in their research on interventions to improve communication in autism. One of our main promising findings in that at the autism level, residency in the school, and presence of another disability, there were no significant differences. According to these results, it is understood that PECS may be effective in different autism levels. However, it is worth mentioning that, as stated in the limitations earlier, the small sample size may have limited the ability to notice differences based on these variables. Child and adolescent psychiatric clinics of North America research focuses on increasing communication actions' rhythm, shape, and purpose to gain different skills at a young age and employ the learned skills in several environments while developing verbal and nonverbal communication abilities. Additionally, this study noted that the lack of significant impact of pre-test scores on post-test performance indicates that the improvements seen were due to the PECS intervention rather than initial skill levels.

Based on the foregoing, younger children (5 years old) have shown better because of PECS intervention. Our main result here is supported by literature on early intervention in autism. Previous work Drozdiel (2012), demonstrates that earlier implementation is effective for young children. Also, the moderate effect size for age (.596) shows that there may be an advantage to introducing it as early as possible for young children.

With these in mind, it is important to note that the lack of significant differences based on autism level means that PECS could be a good intervention for children with autism. Therefore, we recommend that future researchers conduct their studies with larger samples to confirm this study's results.

4.4 Limitations

There was a difference in the levels of autism between the children who were chosen as a sample group for the PECS program, resulting in diverse interaction patterns. These differences in autism levels in the sample led to a range of interaction patterns. So, this could have impacted on the results. One of our main limitations is that some children had difficulty engaging during the sessions. Despite encountering challenges in engaging certain children during the sessions, the researcher made efforts to implement the program for all participants. Notably, PECS cards demonstrated significant effectiveness in capturing the attention and participation of some children. Another major limitation of this study was the sample size. The researcher was able to include only 20 students who were divided into two groups. So, this limitation may hinder the generalization of our results. In the same fashion, the short intervention period was short. The short intervention (10 sessions over two months) may not have captured the full effect of long-term PECS use.

4.5 Recommendations

- Continue using PECS in daily activities for autistic children at home and in school.
- The researcher has proved that younger children get more benefits at a younger age. Thus, the study recommends implanting the PECS at an early age.
- Employing PECS cards in schools and organizations that specialize in autism is one of the main treatment methods.
- Providing a supportive and positive environment for autistic children to enhance their communication skills.
- The researcher recommends using the PECS in daily life activities for autistic children at home and in school.
- Reaching out to specialists while using the program to help implement PECS sufficiently.
- Offering regular training within many periodic sessions.
- Documenting the progress of the child using the cards while following a plan to increase picture numbers and forming sentences and words.
- To do more research in this area and develop more treatment programs aiming to improve autistic children’s communication skills.

- To employ PECS at an early age when diagnosing an autistic child since it has a bigger role in developing communicative and social skills.
- Provide a supportive environment for autistic children to enhance their communication skills.
- The researcher recommends using PECS cards in schools and organizations specializing in autism.

4.6 Conclusion

This study agrees with previous studies which have looked into the effectiveness of PECS and its ability to improve the communication skills of autistic children. The research has adopted a quasi-experimental approach concluding that PECS, which method is to exchange photos, has helped autistic children develop their verbal, nonverbal, and social skills, particularly with early intervention. Hence, the results reflect that autistic children who were projected for early intervention have improved more than older children who were not projected for PECS from an early age. We can conclude that the improvements in communication domains show strong support for the use of PECS as an intervention for autistic children with communication difficulties. PECS has helped to gain different skills from an early age, move these skills along with autistic children to different environments, and improve their communicative language skills.

It is crucial to raise awareness of PECS's effectiveness in improving communication skills for autistic children, as this can improve the children's ability to communicate with their parents and peers at school and in the surrounding environment. It also enhances their communication quality, as communication challenges are considered to be part of DSM-5's symptoms used to diagnose autism. Therefore, the earlier the intervention by teachers and parents using PECS and building shared plans, the better the verbal and nonverbal skills will eventually become. Additionally, early identification and intervention for autism would lead to better results. So, we recommend that special education schools, parents, and other schools put more effort into implementing communication interventions like PECS as early as possible for children with autism.

List of Abbreviations

Abbreviation	Meaning
ANNU	An-Najah National University
ASD	Autism Spectrum Disorder
AT	Assistive Technologies
DSM	Diagnostic And Statistical Manual Of Mental Disorders
NVCSS	The Nonverbal Communication Skills Subscale
PECS	Picture Exchange Communication System
RQ1	Research Question 1
RQ2	Research Question 2
SCSS	The Social Communication Skills Subscale
SGD	Speech-Generating Device
VCSS	The Verbal Communication Skills Subscale

References

Addimando, F. (2024). Effective Communication Strategies. In *Trade Show Psychology* (pp. 53–72). Springer. https://doi.org/https://doi.org/10.1007/978-3-031-53606-9_4

Alamdari, S. B., Sadeghi Damavandi, M., Zarei, M., & Khosrowabadi, R. (2022). Cognitive theories of autism based on the interactions between brain functional networks. *Frontiers in Human Neuroscience*, *16*, 828985. https://doi.org/https://doi.org/10.3389/fnhum.2022.828985

AlSalehi, S. M., & Alhifthy, E. H. (2020). Autism spectrum disorder. In *Clinical Child Neurology* (pp. 275–292). Springer. https://doi.org/https://doi.org/10.1007/978-3-319-43153-6_10

Alsayedhassan, B., Banda, D. R., & Griffin-Shirley, N. (2016). A review of picture exchange communication interventions implemented by parents and practitioners. *Child & Family Behavior Therapy*, *38*(3), 191–208. https://doi.org/https://doi.org/10.1080/07317107.2016.1203135

Ameen, A.-G. A.-A. A.-A. (2013). Miqyas al-maharat al-tawasuliyya lil-tifl al-dhati [The Communicative Skills Scale for the Autistic Child]. *Majallat Al-Irshad al-Nafsi [Journal of Psychological Counseling]*, *2013*(35), 553–569. https://search.emarefa.net/detail/BIM-681300

Amieva, H., Robert, P. H., Grandoulier, A. S., Meillon, C., De Rotrou, J., Andrieu, S., Berr, C., Desgranges, B., Dubois, B., Girtanner, C., Joël, M. E., Lavallart, B., Nourhashemi, F., Pasquier, F., Rainfray, M., Touchon, J., Chêne, G., & Dartigues, J. F. (2016). Group and individual cognitive therapies in Alzheimer's disease: the ETNA3 randomized trial. *International Psychogeriatrics*, *28*(5), 707–717. https://doi.org/https://doi.org/10.1017/S1041610215001830

Anderson, M. (2006). Nonverbal Communication. *In Elsevier EBooks*, 690–692. https://doi.org/10.1016/B0-08-044854-2/01432-2

Andreasen, N. C. (1999). A unitary model of schizophrenia: Bleuler's fragmented phrene as schizencephaly. *Archives of General Psychiatry*, *56*(9), 781–787. https://doi.org/DOI:10.1001/archpsyc.56.9.781

Baker, A., Sabbah, M., & Irshaid, M. S. A. (2021). Nutrition Website for Autistic Children. In *An-Najah National University*. https://hdl.handle.net/20.500.11888/15555

Bhandari, R., Paliwal, J. K., & Kuhad, A. (2020). Neuropsychopathology of autism spectrum disorder: complex interplay of genetic, epigenetic, and environmental factors. In *Personalized food intervention and therapy for autism spectrum disorder management* (pp. 97–141). Springer. https://doi.org/https://doi.org/10.1007/978-3-030-30402-7_4

Bondy, A. S., & Frost, L. A. (1994). The picture exchange communication system. *Focus on Autistic Behavior*, *9*(3), 1–19. https://doi.org/https://doi.org/10.1177/108835769400900301

Busselle, R., & Van den Bulck, J. (2019). Cultivation theory, media, stories, processes, and reality. In *Media effects* (4th Edition, pp. 69–82). Routledge. https://doi.org/https://doi.org/10.4324/9780429491146-5

Castillo, M. E. S. (2020). *Parents' Representations of Autism and Their Autistic Children in Ecuador: A Narrative Study*. California Institute of Integral Studies.

Chaabane, D. B. Ben, Alber-Morgan, S. R., & DeBar, R. M. (2009). The effects of parent-implemented PECS training on improvisation of mands by children with autism. *Journal of Applied Behavior Analysis*, *42*(3), 671–677. https://doi.org/https://doi.org/10.1901/jaba.2009.42-671

Charlop-Christy, M. H., Carpenter, M., Le, L., LeBlanc, L. A., & Kellet, K. (2002). Using the picture exchange communication system (PECS) with children with autism: Assessment of PECS acquisition, speech, social-communicative behavior, and problem behavior. *Journal of Applied Behavior Analysis*, *35*(3), 213–231. https://doi.org/https://doi.org/10.1901/jaba.2002.35-213

Cohmer, S. (2014). Early infantile autism and the refrigerator mother theory (1943-1970). *Embryo Project Encyclopedia*. https://hdl.handle.net/10776/8149

Conrad, C. E., Rimestad, M. L., Rohde, J. F., Petersen, B. H., Korfitsen, C. B., Tarp, S., Cantio, C., Lauritsen, M. B., & Händel, M. N. (2021). Parent-mediated interventions for children and adolescents with autism spectrum disorders: A systematic review and meta-analysis. *Frontiers in Psychiatry*, *12*, 773604. https://doi.org/https://doi.org/10.3389/fpsyt.2021.773604

Consuelo, D. (2018, April 11). *PICTURE EXCHANGE COMMUNICATION SYSTEM (PECS)*. Luna e Stelle Giochi. https://www.lunaestellegiochi.it/picture-exchange-communication-system-pecs/

de Mooij, M. (2014). Communication. In *Human and Mediated Communication around the World* (pp. 1–40). Springer, Cham. https://doi.org/https://doi.org/10.1007/978-3-319-01249-0_1

De Saussure, L., & Rocci, A. (2016). Verbal communication: An introduction. In *Verbal communication (Handbook of Communication Sciences, vol. 3)* (pp. 3–20). Mouton de Gruyter Berlin & New York. https://doi.org/https://doi.org/10.1515/9783110255478-002

Drozdiel, L. S. (2012). *Effectiveness of the picture exchange communication system for preschool children with special needs* [The State University of New York]. http://hdl.handle.net/20.500.12648/375

Durà-Vilà, G., Dein, S., & Hodes, M. (2010). Children with intellectual disability: A gain not a loss: Parental beliefs and family life. *Clinical Child Psychology and Psychiatry*, *15*(2), 171–184. https://doi.org/DOI:10.1177/1359104509341009

Elder, L., & Paul, R. (2008). Critical thinking: The nuts and bolts of education. *Optometric Education*, *33*(3).

Ellison, D. (2015). Communication skills. *The Nursing Clinics of North America*, *50*(1), 45–57. https://doi.org/https://doi.org/10.1016/j.cnur.2014.10.004

Evans, B. (2013). How autism became autism: The radical transformation of a central concept of child development in Britain. *History of the Human Sciences*, *26*(3), 3–31. https://doi.org/https://doi.org/10.1177/0952695113484320

Faras, H., Al Ateeqi, N., & Tidmarsh, L. (2010). Autism spectrum disorders. *Annals of Saudi Medicine*, *30*(4), 295–300. https://doi.org/10.4103/0256-4947.65261

Farzana, W., Sarker, F., Chau, T., & Mamun, K. A. (2021). Technological evolvement in AAC modalities to Foster communications of verbally challenged ASD children: A systematic review. *IEEE Access*. https://doi.org/https://doi.org/10.1109/access.2021.3055195

Field, A. (2013). *Discovering Statistics Using IBM SPSS Statistics*. SAGE Publications. https://books.google.co.in/books?id=Yh-SAQAACAAJ

Gerenser, J., & Lopez, K. (2017). Autism spectrum disorders. In *Handbook of child language disorders* (2nd Edition, pp. 82–108). Psychology Press.

Gilroy, S. P., Leader, G., & McCleery, J. P. (2018). A pilot community-based randomized comparison of speech generating devices and the picture exchange communication system for children diagnosed with autism spectrum disorder. *Autism Research : Official Journal of the International Society for Autism Research*, *11*(12), 1701–1711. https://doi.org/https://doi.org/10.1002/aur.2025

Gitimoghaddam, M., Chichkine, N., McArthur, L., Sangha, S. S., & Symington, V. (2022). Applied behavior analysis in children and youth with autism spectrum disorders: a scoping review. *Perspectives on Behavior Science*, *45*(3), 521–557. https://doi.org/https://doi.org/10.1007/s40614-022-00338-x

Gough, J. (2024). Theory of Mind and Its Role in Theories of Autism. In *The Palgrave Encyclopedia of Disability* (pp. 1–7). Springer. https://doi.org/https://doi.org/10.1007/978-3-031-40858-8_15-1

Haney, J. L. (2014). *Representations of autism in the social work literature from 1970 to 2013: A critical content analysis*. Widener University.

Harvey, P. D., Velligan, D. I., & Bellack, A. S. (2007). Performance-based measures of functional skills: usefulness in clinical treatment studies. *Schizophrenia Bulletin*, *33*(5), 1138–1148. https://doi.org/https://doi.org/10.1093/schbul/sbm040

Hassan, Z., & Khashab, S. (2018). Diagnosing autism between the revised fourth edition (2000.dsm iv-tr) and the fifth edition (2013, dsm-5-(apa). *Al-Fath Journal for Psychological and Educational Studies*, *2*, pp. 137-148.

Hirota, T., & King, B. H. (2023). Autism spectrum disorder: a review. *Jama*, *329*(2), 157–168. https://doi.org/doi:10.1001/jama.2022.23661

Jamal, H. A. (2020). Developing the Language Ability of Children with Autism Spectrum Disorder (ASD) Using Assistive Technology and a Picture Exchange Communication System (PECS) through Adapting elements of the Australian Educational Environment on Inclusive Public Schools in Saudi Arabia. *Majalat Altarbiat Alkhasat Waltaahil [Journal of Special Education and Rehabilitation]*, *10*((36-Part one)), 1–47.

Kenila, E., Ediyanto, E., Efendi, M., & Hitipeuw, I. (2022). Improving expressive communication in children with autism using social story and picture exchange communication system. In *Improving Assessment and Evaluation Strategies on Online Learning* (pp. 1–7). Routledge. https://doi.org/DOI10.1201/9781003261346-1

Klappa, P. (2019). *Cohens d effect size paired t test - YouTube*. https://www.youtube.com/watch?v=K6GRHelAOYw

Kulage, K. M., Smaldone, A. M., & Cohn, E. G. (2014). How will DSM-5 affect autism diagnosis? A systematic literature review and meta-analysis. *Journal of Autism and Developmental Disorders*, *44*(8), 1918–1932. https://doi.org/https://doi.org/10.1007/s10803-014-2065-2

Lagos, P., Baeza, R., Pinto, O., Costa, G., Ruete, D., Fuentealba, D., & Gatica, G. (2021). L-PECs: Application for inclusive work environments. *Procedia Computer Science*, *184*, 396–403. https://doi.org/https://doi.org/10.1016/j.procs.2021.03.050

Lappé, M., Lau, L., Dudovitz, R. N., Nelson, B. B., Karp, E. A., & Kuo, A. A. (2018). The diagnostic odyssey of autism spectrum disorder. *Pediatrics*, *141*(Supplement_4), S272–S279. https://doi.org/doi:10.1542/peds.2016-4300C

Larsson, E. V. (2013). Is applied behavior analysis (ABA) and early intensive behavioral intervention (EIBI) an effective treatment for autism? A cumulative history of impartial independent reviews. *Autism*, *27*(1), 168–1792.

Lesser, J., & Ebert, K. D. (2020). Examining social communication effects of a picture communication board in a child with autism. *Perspectives of the ASHA Special Interest Groups*, *5*(2), 492–505. https://doi.org/https://doi.org/10.1044/2020_PERSP-19-00113

Li, M., Santpere, G., Imamura Kawasawa, Y., Evgrafov, O. V, Gulden, F. O., Pochareddy, S., Sunkin, S. M., Li, Z., Shin, Y., & Zhu, Y. (2018). Integrative functional genomic analysis of human brain development and neuropsychiatric risks. *Science*, *362*(6420), eaat7615. https://doi.org/https://doi.org/10.1126/science.aat7615

Maleki, A., Noorbakhsh, M., Farhoudian, A., Hassani, S., & Karladani, S. A. (2022). Functional Assessment Of Challenging Behavior And Neurological & Cardio-Pulmonary Problem In Patients With Autism Syndrome: Diagnosis And Treatment. *Journal of Pharmaceutical Negative Results*, 4112–4136. https://doi.org/DOI:10.47750/pnr.2022.13.S10.497

Manalu, A. P., Ramayanti, I., & Arsyad, K. H. M. (2013). Faktor-Faktor Kejadian Penyakit Autisme Anak di Bina Autis Mandiri Palembang. *Syifa'MEDIKA: Jurnal Kedokteran Dan Kesehatan*, *4*(1), 16–21.

Mason, M. A. (2005). *Effects of therapeutic riding in children with autism*. Capella University.

McDonald, S., Togher, L., & Code, C. (2013). *Social and communication disorders following traumatic brain injury* (SECOND EDITION). Psychology press.

McGinley, E., & Varchevker, A. (2018). *Enduring trauma through the life cycle*. Routledge.

McGuinness, S. (2022, November). *History of Autism*. Autism Independent UK. https://autismuk.com/history-of-autism/

McMahon, J., & Cullinan, V. (2014). Education programmes for young children with Autism Spectrum Disorder: An Evaluation Framework. *Research in Developmental Disabilities*, *35*(12), 3689–3697. https://doi.org/10.1016/J.RIDD.2014.09.004

Mohamad, M., Esa, P. N., & Kamarudin, R. (2022). Parents' Perceptions of Using Picture Exchange Communication System (PECS) in English for Autism Spectrum Disorder (ASD) Children. *Creative Education*, *13*(11), 3602–3623. https://doi.org/doi:10.4236/ce.2022.1311230

Mukerji, C., Mottron, L., & McPartland, J. C. (2021). Enhanced perceptual functioning. In *Encyclopedia of Autism Spectrum Disorders* (pp. 1780–1781). Springer. https://doi.org/https://doi.org/10.1007/978-3-319-91280-6_723

Muratori, F., Calderoni, S., & Bizzari, V. (2021). George Frankl: an undervalued voice in the history of autism. *European Child & Adolescent Psychiatry*, *30*, 1273–1280. https://doi.org/https://doi.org/10.1007/s00787-020-01622-4

Noelle-Neumann, E. (1974). The spiral of silence a theory of public opinion. *Journal of Communication*, *24*(2), 43–51. https://doi.org/https://doi.org/10.1111/j.1460-2466.1974.tb00367.x

Ousley, O., & Cermak, T. (2014). Autism spectrum disorder: defining dimensions and subgroups. *Current Developmental Disorders Reports*, *1*, 20–28. https://doi.org/https://doi.org/10.1007/s40474-013-0003-1

Panerai, S., Ferrante, L., & Zingale, M. (2002). Benefits of the Treatment and Education of Autistic and Communication Handicapped Children (TEACCH) programme as compared with a non-specific approach. *Journal of Intellectual Disability Research*, *46*(4), 318–327. https://doi.org/https://onlinelibrary.wiley.com/doi/abs/10.1046/j.1365-2788.2002.00388.x#:~:text=https%3A//doi.org/10.1046/j.1365%2D2788.2002.00388.x

Prizant, B. M.., & Fields-Meyer, Thomas. (2022). *Uniquely human□: a different way of seeing autism*. Simon & Schuster Paperbacks.

Pyramid Educational Consultants. (2024, July 8). *Home - Pyramid Educational Consultants of Germany GmbH*. https://pecs-germany.com/

Reith-Hall, E., & Montgomery, P. (2022). The teaching and learning of communication skills in social work education. *Research on Social Work Practice*, *32*(7), 793–813. https://doi.org/https://doi.org/10.1177/10497315221088285

Rogala, A., & Bialowas, S. (2016). Theory of communication: Evolution, approaches, models. In *Communication in Organizational Environments: Functions, Determinants and Areas of Influence* (pp. 1–27). Springer. https://doi.org/https://doi.org/10.1057/978-1-137-54703-3_1

Röhner, J., & Schütz, A. (2023). Classic Models of Communication. In *Psychology of Communication* (pp. 21–40). Springer. https://doi.org/https://doi.org/10.1007/978-3-030-60170-6_2

Rosello, B., Berenguer, C., Baixauli, I., García, R., & Miranda, A. (2020). Theory of mind profiles in children with autism spectrum disorder: Adaptive/social skills and pragmatic competence. *Frontiers in Psychology*, *11*, 567401. https://doi.org/https://doi.org/10.3389/fpsyg.2020.567401

Rosenthal, R., Cooper, H., & Hedges, L. (1994). Parametric measures of effect size. In *The handbook of research synthesis* (Vol. 621, Issue 2, pp. 231–244). New York.

Santos, P. de A., Bordini, D., Scattolin, M., Asevedo, G. R. da C., Caetano, S. C., Paula, C. S., Perissinoto, J., & Tamanaha, A. C. (2021). The Impact of the Implementation of the Picture Exchange Communication System–PECS on Understanding Instructions in Children with Autism Spectrum Disorders. *CoDAS*, *33*, e20200041. https://doi.org/https://doi.org/10.1590/2317-1782/20202020041

Schreibman, L. (1988). Diagnostic features of autism. *Journal of Child Neurology*, *3*(1_suppl), S57–S64. https://doi.org/https://doi.org/10.1177/0883073888003001S11

Schwartz Offek, E., & Segal, O. (2022). Comparing theory of mind development in children with autism spectrum disorder, developmental language disorder, and typical development. *Neuropsychiatric Disease and Treatment*, 2349–2359. https://doi.org/https://doi.org/10.2147/NDT.S331988

Schwartz, L., Beamish, W., & McKay, L. (2021). Understanding social-emotional reciprocity in autism: viewpoints shared by teachers. *Australian Journal of Teacher Education (Online)*, *46*(1), 24–38. https://doi.org/https://doi.org/10.14221/ajte.202v46n1.2

Simeoli, R., Iovino, L., Guglielmino, G., Marocco, D., & Rega, A. (2024). A comparison of Picture Exchange Communication System (PECS) and Speech-Generating Device (SGD) as communication aids for children with Autism

Spectrum Disorders. *LIFE SPAN AND DISABILITY*, *27*(1), 43–67. https://doi.org/doi:10.57643/lsadj.2024.27.1_03

Skeppar, P., Thoor, R., Agren, S., Isakson, A.-C., Skeppar, I., Persson, B. A., & Fitzgerald, M. (2013). Neurodevelopmental disorders with comorbid affective disorders sometimes produce psychiatric conditions traditionally diagnosed as schizophrenia. *Clinical Neuropsychiatry*, *10*(3–4), 123–134. https://link.gale.com/apps/doc/A355308583/HRCA?u=anon~7bddedba&sid=googleScholar&xid=c9e9aea4

Smith, T., Mruzek, D. W., & Mozingo, D. (2015). Sensory integration therapy. In *Controversial therapies for autism and intellectual disabilities* (2nd Edition, pp. 247–269). Routledge.

Tamanaha, A. C., Olivatti, D. O. F., Silva, S. C. da, Vieira, S. C. P., & Perissinoto, J. (2023). Picture Exchange Communication System (PECS) Implementation Program for children with autism spectrum disorder. *CoDAS*, *35*, e20210305. https://doi.org/https://doi.org/10.1590/2317-1782/20232021305en

Uljarević, M., Frazier, T. W., Jo, B., Billingham, W. D., Cooper, M. N., Youngstrom, E. A., Scahill, L., & Hardan, A. Y. (2022). Big data approach to characterize restricted and repetitive behaviors in autism. *Journal of the American Academy of Child & Adolescent Psychiatry*, *61*(3), 446–457. https://doi.org/https://doi.org/10.1016/j.jaac.2021.08.006

Uljarević, M., Frazier, T. W., Jo, B., Phillips, J. M., Billingham, W., Cooper, M. N., & Hardan, A. Y. (2021). Relationship between social motivation in children with autism spectrum disorder and their parents. *Frontiers in Neuroscience*, *15*, 660330. https://doi.org/https://doi.org/10.3389/fnins.2021.660330

Van Ruler, B. (2020). Communication theory: An underrated pillar on which strategic communication rests. In *Future directions of strategic communication* (1st Edition, pp. 39–53). Routledge. https://doi.org/https://doi.org/10.1080/1553118X.2018.1452240

Verma, J. P., & Abdel-Salam, A. S. G. (2019). Testing statistical assumptions in research. In *Testing Statistical Assumptions in Research*. wiley. https://doi.org/10.1002/9781119528388

Watkins, L., Kuhn, M., Ledbetter-Cho, K., Gevarter, C., & O'Reilly, M. (2017). Evidence-based social communication interventions for children with autism spectrum disorder. *The Indian Journal of Pediatrics*, *84*, 68–75. https://doi.org/https://doi.org/10.1007/s12098-015-1938-5

Wendt, O., Hsu, N., Simon, K., Dienhart, A., & Cain, L. (2019). Effects of an iPad-based speech-generating device infused into instruction with the picture exchange communication system for adolescents and young adults with severe autism spectrum disorder. *Behavior Modification*, *43*(6), 898–932. https://doi.org/https://doi.org/10.1177/0145445519870552

WHO. (2022, March 30). *Autism*. https://www.who.int/news-room/questions-and-answers/item/autism-spectrum-disorders-(asd)

Zhao, H., Swanson, A. R., Weitlauf, A. S., Warren, Z. E., & Sarkar, N. (2018). Hand-in-hand: A communication-enhancement collaborative virtual reality system for promoting social interaction in children with autism spectrum disorders. *IEEE Transactions on Human-Machine Systems*, *48*(2), 136–148. https://doi.org/https://doi.org/10.1109/thms.2018.2791562

Zhao, M., & Chen, S. (2018). The Effects of Structured Physical Activity Program on Social Interaction and Communication for Children with Autism. *BioMed Research International*, *2018*. https://doi.org/https://doi.org/10.1155/2018/1825046

Zimmer, M., Desch, L., Rosen, L. D., Bailey, M. L., Becker, D., Culbert, T. P., McClafferty, H., Sahler, O. J. Z., Vohra, S., Liptak, G. S., Adams, R. C., Burke, R. T., Friedman, S. L., Houtrow, A. J., Kalichman, M. A., Kuo, D. Z., Levy, S. E., Norwood, K. W., Turchi, R. M., & Wiley, S. E. (2012). Sensory Integration Therapies for Children With Developmental and Behavioral Disorders. *Pediatrics*, *129*(6), 1186–1189. https://doi.org/https://doi.org/10.1542/peds.2012-0876

Zohoorian, Z., Zeraatpishe, M., & Matin sadr, N. (2021). Effectiveness of the picture exchange communication system in teaching English vocabulary in children with autism spectrum disorders: A single-subject study. *Cogent Education*, *8*(1), 1892995. https://doi.org/https://doi.org/10.1080/2331186X.2021.1892995

Appendices

Appendix A

Sessions

First Session

Introductory session and engaging the autistic children in the Program

The session duration: 30 minutes.

The specific objectives:

- Achieving intimacy and acceptance among the autistic children each other and with the researcher in the presence of their teacher in the classroom.
- Achieving autistic children's ability to involve and engage with each other and introduce themselves by forming a sentence of at least 3 words.

Techniques and tools:

Favorite items for the autistic children (toys, dolls, food, and drinks) were determined by asking teachers and parents. PECS pictures samples, gifts for reinforcing and supporting, modeling, and repetition.

The Session execution (steps and producers):

The PECS program relies on assisting children to express themselves starting with the first word so that they can gradually express themselves through a complete sentence. To assist the autistic children in be familiar with the PECS program and the researcher, three teachers and the researcher presented each autistic child with pairs of choices, to be sure to match each item (a favorite item) at least once with the other item (a picture in the PECS). Then the researcher documented the items chosen most often, least often, or that produce a notable response (e.g., a child tastes something and spits it out, a child throws item after choosing it). When every autistic child made the right match, the researcher presented a favorite gift to reinforce, encourage, and establish a relationship with every child.

In the second step, the researcher presented herself five times by putting her hand on her chest, smiling, and saying "Hi, my name is Aseel", to encourage the autistic children to imitate and model her behavior.

Some children were able to mention their names with a complete sentence of 3 words (for example: My name is Saeed), and some only mentioned his name (for example: Ahmad).

After the children presented themselves, the researcher gave two cards to every child, (a happy face card and sadness face card) and asked them, "How are you today?". In order to help the children, the researcher began with herself and answered the question by raising the happy face card "I am happy today." The researcher asked every child to express his emotions by forming a sentence consisting of 3 words. Some children were able to express a complete sentence using face cards with the researcher's and teachers' support. Some of them were just able to put their finger on the face cards that represented their emotions without saying something, and others just used one word to describe their emotions. The following pictures show the emotional cards that were presented to the participants during the session.

Session evaluation:

The researcher observed the behaviors of autistic children while they were trying to express themselves. And she reinforced them when making the right attempts or approaching them. She asked the participating teachers about the children's interaction, and the evaluation was very good (4 out of 5).

Second Session

Express daily basic needs

The session duration: 40 minutes.

The specific objective:

- Express the autistic
- children's daily basic needs such as food, drink, and do something.

Techniques and tools:

PECS pictures cards, colored balloons, gifts for reinforcing and supporting, prompting, modeling, and repetition.

The Session execution (steps and producers):

This session aimed to assist autistic children to express their basic daily needs such as eating and drinking. The session started with an exchange of greetings between the researcher, teachers, and the autistic children. Then, the researcher showed PECS picture cards to the children, and she named food and drinks in those cards. The researcher asked and answered the following question "What do I want to eat", and "What do I want to drink", and repeated that many times to enable the autistic children to understand, differentiate, and express their needs. During that, the researcher showed one picture "bottle of water", and said, "I want to drink water.". The children positively reacted and engaged in this activity. Most of them were able to distinguish between picture cards and verbally express their needs.

The researcher asked each child, "What would you like to drink?" "What would you like to eat?" And each child chose a card that expresses what he wanted, and through prompting and repetition, each child formed a sentence of 4 words that included what he wanted to eat or drink, such as saying, "I want to drink juice."

The session was closed by asking each child to place the picture of his choice beside the food or drink he preferred (matching), then the children were reinforced and colored balloons were distributed to them, which spreaded the atmosphere of fun among them.


Session evaluation:

The researcher observed the behaviors of autistic children while they were trying to express their needs. And she reinforced them when making the right attempts or approaching them. She asked the participating teachers about the children's interaction, and the evaluation was excellent (5 out of 5).

Third Session

Recognizing the desired types of food and distinguishing among them

The session duration: 40 minutes.

The specific objective:

Recognize and distinguish the desired types of food and assist autistic children to express verbally their desired food.

Techniques and tools:

PECS pictures cards, coloring pens, gifts for reinforcing and supporting, prompting, modeling, and repetition.

The Session execution (steps and producers):

This session aimed to help the autistic children to mention and determine their preferred food by selecting picture cards in PECS and then forming a sentence of 4 words.

The session started with an exchange of greetings between the researcher, teachers, and the autistic children. Then, the researcher showed PECS picture cards to the children, and she named and determined her preferred food in those cards. The researcher asked and answered the following question "What is my preferred food", and repeated that many times to enable the autistic children to understand, differentiate, and express their preferred food by forming sentences. During that, the researcher showed one picture “Salad”, and said, “My preferred food is salad.”. The children positively reacted and engaged in this activity. Most of them were able to distinguish between picture cards and verbally express their preferred food.

The researcher asked each child, “What is your preferred food?” and each child selected a card that expresses what he preferred, and through prompting and repetition, most children formed a sentence of 4 words that included their preferred food, such as saying, “my preferred food is rice.”. The researcher encouraged every child to speak a full sentence of 4 words, using repetition, modeling, and promoting. Every child who passed this task was reinforced by clapping.

The session was closed by asking each child to place the picture of his choice beside the food he preferred (matching), then the children were reinforced, and coloring pens were distributed to them.

Session evaluation:

The researcher observed the behaviors of autistic children while they were trying to express their preferred food. And she reinforced them when making the right attempts or approaching them. She asked the participating teachers about the children's interaction, and the evaluation was excellent (5 out of 5)

Fourth Session

Expressing the desire to play and distinguish between some figures and toys

The session duration: 40 minutes.

The specific objective:

Express the autistic children their desire to play and distinguish between some figures by helping them to understand the different means of transportation (bus, car, plane, train) and teaching them animals names and shapes by using small figures and toys.

Techniques and tools:

PECS pictures cards, role-playing, drawing papers, gifts for reinforcing and supporting, prompting, modeling, and repetition.

The Session execution (steps and producers):

This session aimed to help the autistic children to mention and name transportation means and animals by selecting picture cards in PECS and then forming a sentence of 4 or 5 words.

The session started with an exchange of greetings between the researcher, teachers, and the autistic children. Then, the researcher distributed small figures of the various means of transportation on the table in front of the children and mentioned the names of them during distributing them, in addition, she presented picture cards that represent the transportation means in daily life.

The researcher matched each model of transportation means with its corresponding picture in PECS and showed it to the children, and she said out loud (I like the plane, I like to travel by plane), (I like the bus, I go to school by bus). Then the researcher gave the opportunity for each child to choose a card with a model of the transportation means and encouraged him to express his preferred toy in a correct sentence formation consisting of (4-5 words). Each child was asked the question: “What do you want to play?”, And through promoting and modeling, each child must say "For example, I like to play with the plane". The researcher gave the children (10) minutes to play with each other using different means of transportation.

After that, she gave them the opportunity to learn the names and shapes of animals through models and PECS pictures, as she distributed animal models on the table in front of the children and showed them pictures of PECS cards that contains the names and shapes of animals.

The researcher mentioned the name of each animal on the table, raised the picture card while holding the animal, and said its name out loud and audible to everyone. The researcher repeated this several times, then began asking each child, "Which game do you want to play?" Through this activity, each child can ask for what he wants to play with automatically by giving him a picture of the thing he wants to play with. After that, each child was trained to form a sentence using PECS cards: "I want a picture of the dog." The researcher gave the children (10) minutes to play with each other using animal toys and encouraged them to form correct sentences of 4 to 5 words.

Session evaluation:

The researcher observed the behaviors of autistic children while they were trying to form a correct and complete sentence. And she reinforced them when making the right attempts or approaching them. She asked the participating teachers about the children's interaction, and the evaluation was very good (4 out of 5).

The Fifth Session

Expressing and matching pictures in PECS with physical objects

The session duration: 40 minutes.

The specific objective:

Helping the autistic children to match pictures with similar physical objects.

Techniques and tools:

PECS pictures cards, notebook, role-playing, real fruits and vegetables, figures of banana, apple, ball, circle, and car. Gifts for reinforcing and supporting, prompting, modeling, and repetition.

The Session execution (steps and producers):

This session aimed to help the autistic children to mention and name physical items by selecting picture cards in PECS and then forming a sentence of 4 or 5 words.

The session started with an exchange of greetings between the researcher, teachers, and the autistic children. Then, the researcher showed small figures of the various items on the table in front of the children and mentioned the names of them during distributing them (notebook, banana, apple, ball, circle, and car), in addition, she presented picture cards that represent the physical items.

The researcher matched each model of the physical items with its corresponding picture in PECS and showed it to the children, and she said out loud (This is a car … etc.) and so on. Then the researcher gave the opportunity for each child to choose a card with a model of the physical items and encouraged him to express his preferred item in a correct sentence formation consisting of (3-4 words). Each child was asked the question: “What do you want to play?”, And through promoting and modeling, each child must say "For example, I like to play with the notebook". The researcher gave the children (10) minutes to play with each other using the physical items.

Session evaluation:

The researcher observed the behaviors of autistic children while they were trying to form a correct and complete sentence. And she reinforced them when making the right attempts or approaching them by distributing real fruits and vegetables. She asked the participating teachers about the children's interaction, and the evaluation was very good (4 out of 5).

The Sixth Session

Express feelings

The session duration: 40 minutes.

The specific objective:

Help the autistic children to express their different feelings, emotions, and ideas. And this session aimed to assist autistic children distinguish different feelings (happy, upset, angry), and teach them emotional expression skills and describe feelings by using card pictures in PECS.

Techniques and tools:

PECS pictures cards, role-playing, candies, gifts for reinforcing and supporting, prompting, modeling, and repetition.

The Session execution (steps and producers):

This session aimed to help the autistic children to describe, express, and name feelings by selecting picture cards in PECS and then forming a sentence of 4 or 5 words.

The session started with an exchange of greetings between the researcher, teachers, and the autistic children. Then, the researcher prepared the session by sitting next to the children around the table and placing picture cards of PECS in front of them. The cards contain pictures of different emotional states (happy, upset, angry, hungry, sleepy, surprised).

The researcher started by showing the pictures to the children, explaining to them the emotions in each picture of PECS cards, and expressed each card by forming a complete and correct sentence to help children to understand the emotional state in each picture. During that, the researcher raised the pictures of the cards in front of all the children and said (For example: Today a boy is upset, a boy is sleepy and wants to sleep). Then the researcher asked each child to choose a specific card and express the emotional state in the picture and form a sentence of 4 or 5 words.

Children with autism participated effectively during the session with the support of the researcher and the teachers. Verbal prompting and repetition were employed to form a clear and complete sentence of 4 or 5 words. Each child was able to form different sentences, in addition, using facial expressions, the researcher described some feelings and asked the children to imitate her, which sparked an atmosphere of joy and fun among the autistic children, and they participated effectively, as they succeeded in forming sentences correctly to a large extent.

Session evaluation:

The researcher observed the behaviors of autistic children while they were trying to form a correct and complete sentence. For example, they succeeded in forming many sound sentences (Today the boy is angry, the boy is very sick, the girl is afraid of the dog, the boy is sleepy and wants to sleep, the boy is crying and upset) and the researcher reinforced them when making the right attempts or approaching them by distributing candies. She asked the participating teachers about the children's interaction, and the evaluation was excellent (5 out of 5)

The Seventh Session

Acquiring the skills of distinguishing human body parts

The session duration: 40 minutes.

The specific objective:

Help the autistic children to acquire the skills of distinguishing and naming the human body parts.

Techniques and tools:

PECS pictures cards, human body parts models, Lego pieces, gifts for reinforcing and supporting, prompting, modeling, and repetition.

The Session execution (steps and producers):

This session aimed to help the autistic children to mention and name human body parts (such as belly, neck, head, eyes, etc) by selecting picture cards in PECS and then forming a sentence of 4 or 5 words. Every child should respond to the name of the human body part in PECS pictures by pointing to a specific part in his own body.

The session started with an exchange of greetings between the researcher, teachers, and the autistic children. Then, the researcher showed big size pictures of human body parts and named every part loudly and pointed at these parts in her body and in pictures (Starting from the hair, head, eyes, nose, to the feet). In addition, she matched each human part with its corresponding picture in PECS and showed it to the children, and she said out loud (For Example This is an eye …… this is a head …etc.). During that the researcher many times pointed at a corresponding part in her body and formed a sentence that describes a specific human part (For example This is my hand), and the children imitated her. The researcher and teachers encouraged every child to express and form a correct and clear sentence consisting of (4-5 words) to distinguish his body part. The researcher gave the children (10) minutes to play with each other using different human parts models.

The researcher explained some functions of human body parts without much focus on that, because the children's teachers explained these functions in detail during the same period of the PECS program execution, so the researcher just named each part and showed one function for it. Then the researcher gave the children (10) minutes to play with each other using human body parts through models and PECS pictures and encouraged them to form correct sentences of 4 to 5 words.

Session evaluation:

The researcher observed the behaviors of autistic children while they were trying to form a correct and complete sentence. For example, they succeeded in forming many sound sentences (This is my leg …. This is my nose) and the researcher reinforced them when making the right attempts or approaching them by distributing Lego pieces. She asked the participating teachers about the children's interaction, and the evaluation was excellent (5 out of 5).

The Eighth Session

Understand and name daily activities

The session duration: 40 minutes.

The specific objective:

- Understand and name daily things and activities ((run, jump, and play) among the autistic children.
- Forming sentences with verbs and trying to express them physically or behaviorally.

Techniques and tools:

PECS pictures cards, small balls, gifts for reinforcing and supporting, prompting, modeling, and repetition.

The Session execution (steps and producers):

This session aimed to help the autistic children to name daily activities and things and express some related actions by selecting picture cards in PECS and then forming a sentence of 3 to 5 words. The session started with an exchange of greetings between the researcher, teachers, and the autistic children.

This session was performed outdoors; the researcher sat with the children on the ground in a circular manner in the outdoor arena, to motivate them to do some motor and physical activities in the open air.

The researcher held the picture cards in PECS that contained pictures of some actions, stood in front of the children, and spoke aloud, pointing to the picture and at the same time imitating what the picture contained so that she could convey the idea to the children smoothly. The researcher asked the children to act, move, and imitate her action (applause), and during that, she said, "I love to applaud the clever child." Accordingly, the activities and actions in the PECS pictures were named, imitated, carried out in motion, and expressed verbally, and the children effectively engaged in this activity.

The researcher encouraged the children to form a sound and complete sentence consisting of 3-5 words. Each child expressed the picture cards and named the verbs that were included. The researcher encouraged each child to hold the card and express it in a complete sentence, trying to move or act in front of the rest of the children. Prompting was used, and the researcher encouraged the children to imitate the movements or actions of the rest of their classmates in order to learn from each other. Most of the children were able to express daily activities well, for example (the boy brushes his teeth, the boy helps his mother, and so on).

Then the researcher gave the children (10) minutes to play outdoors and encouraged them to form correct sentences of 3 to 5 words.

Session evaluation:

The researcher observed the behaviors of autistic children while they were trying to form a correct and complete sentence. For example, they succeeded in forming many sound sentences (I am jumping, I am walking) and the researcher reinforced them when making the right attempts or approaching them by distributing small balls to play with. She asked the participating teachers about the children's interaction, and the evaluation was very good (4 out of 5).

The Ninth Session

Acquisition of inter-object relationship skills

The session duration: 40 minutes.

The specific objective:

- Acquire the skills of relationships between things such as animals.

Techniques and tools:

PECS pictures cards, animal models, coloring pens and pages, gifts for reinforcing and supporting, prompting, modeling, and repetition.

The Session execution (steps and producers):

This session aimed to help the autistic children to identify the relationships between different objects or things, especially animals, and form a sentence describing something related to animals, such as a cow eating grass, with the aim of understanding what each animal eats by using PECS picture cards.

The session started with an exchange of greetings between the researcher, teachers, and the autistic children. The researcher asked the children to sit around the table to do the activity for this session, and she showed PECS cards that contained different pictures of some animals, and she showed other pictures that contained the food that animals usually eat, that is, she used two pictures from PECS, and during that, the researcher repeated loudly and audibly some sentences that describe what animals eat, for example (the monkey eats the banana, the rabbit eats the carrot).

Then the researcher asked the children to participate in the activity and encouraged them to form complete and sound sentences consisting of 3-4 words. The researcher noticed that some children were unable to understand the goal of the activity and form complete and correct sentences using picture cards, and with the use of repetition, prompting, encouragement, and reinforcement, most of the children were able to form sound and complete sentences using two cards and making a connection between them, for example, some children said (the rabbit loves to eat carrots, the dog eating a bone, the cat drinks milk).

Then the researcher gave the children (10) minutes to play with each other and use animal models to encourage them to form correct sentences of 3 to 4 words.

Session evaluation:

The researcher observed the behaviors of autistic children while they were trying to form a correct and complete sentence. For example, they succeeded in forming many sound sentences (cat drinks milk … horse eats an apple) and the researcher reinforced them when making the right attempts or approaching them by distributing coloring pens and pages. She asked the participating teachers about the children's interaction, and the evaluation was very good (4 out of 5).

The Tenth Session

Closing the PECS program and conducting the post-test

The session duration: 30 minutes.

The specific objective:

- Reinforcing and thanking the children, distributing some gifts to them, and ending the training program.
- Conducting the post-test on the autistic children's teachers.

Techniques and tools:

Gifts for reinforcing and supporting children and the questionnaire for teachers.

The Session execution (steps and producers):

The researcher welcomed the teachers and autistic children and thanked them for their commitment and interest in attending, and then she presented some gifts to children. Then she reminded them that this session is the last and the post-test was conducted on the teachers.

Session evaluation:

The interaction of children and their teachers in the tenth session was excellent, furthermore, the post-test was applied.

Appendix B

Sessions in Arabic

الجلسة الأولى

جلسة تمهيدية والقدرة على تكوين جملة سليمة ومفهومة

المدة الزمنية للجلسة: 30 دقيقة.

أهداف الجلسة:

تهدف هذه الجلسة إلى تحقيق الاتي:

- تحقيق الألفة والتقبل والتعرف على وجود مشاركة ضمن وجود المعالجة في الصف.
- القدرة على الاندماج ومحاولتهم على التعريف عن نفسهم من خلال جملة مكونة من 3 كلمات على الاقل.

الأساليب المستخدمة:

المحاضرة والمناقشة مع الطلاب، بطاقات بيكس المصورة، النمذجة، التكرار، الدعم.

خطوات سير الجلسة:

يسعى هذا النشاط إلى التعرف على أسماء الأطفال المشاركين، وذكر الحالة الانفعالية ليوم الجلسة، ومحاولة تكوين جملة من 3 كلمات عند ذكر الاسم وعند ذكر الحالة الانفعالية.

1. تبدأ الجملة بتبادل الترحيب بين الأطفال المشاركين والباحثة.
2. تقوم الباحث بالبدء من خلال التعريف عن نفسها بذكر " أنا أسمي أسيل " ، ووضع اليد عند منطقة أسفل الرقبة للقدرة على أيصال المعلومة لأطفال التوحد المشاركين بأن المشاركة تتحدث عن نفسها، لتشرح لهم أن يقوموا بالتعريف عن نفسهم بنفس الطريقة (النمذجة)، فبعض الأطفال استطاعوا أن يذكروها بجملة كاملة من 3 كلمات (مثلاً: أنا اسمي سعيد)، والبعض ذكر اسمه فقط، وذلك لاختلاف القدرات الفردية بين المشاركين.

3. بعد التعرف على الأطفال المشاركين، تم طرح سؤال عليهم " كيف حالك اليوم؟ "، مع رفع بطاقتين مصورتين تدل كل منهما على حالة الطفل " وجه فرح، ووجه أخر حزين" فطرحت بالبداية الباحثة بالجواب عن نفسها بالبداية مع رفع البطاقة " أنا اليوم مبسوطة "، بذلك تسأل الباحثة الأطفال لكي يعبروا عن حالتهم الانفعالية بجملة مكونة من 3 كلمات، فبرنامج بيكس يعتمد على محاولة أن يعبر عن نفسه بدءاً من كلمة أولى حتى يستطيع تدريجياً يعبر عن نفسه عن طريق جملة كاملة، فقامت بسؤال كل طفل بدوره " كيف حالك اليوم؟" وهنا استطاع البعض أن يعبر بجملة كاملة مع وجود الدعم من قبل الباحثة على وضع إصبعهم على الوجه الذي يمثله اليوم، ومنهم من تحدث بالحالة الانفعالية بكلمة واحدة فقط، الصور الاتية توضح البطاقات للحالة الانفعالية التي عرضت مع المشاركين في الصف.

التقويم:

- تقوم الباحثة بملاحظة سلوكيات أطفال التوحد أثناء محاولتهم للتعبير عن أنفسهم.
- تقدم الباحثة بالتعزيز الإيجابي عند محاولات الأطفال بتكوين جملة كاملة.

الجلسة الثانية

التعبير عن الاحتياجات الأساسية اليومية

المدة الزمنية للجلسة: 40 دقيقة.

أهداف الجلسة:

تهدف هذه الجلسة إلى تحقيق الاتي:

التعبير عن احتياجات الأكل واحتياجات الشرب.

الأساليب المستخدمة:

المحاضرة والمناقشة، الدعم، بطاقات بيكس المصورة ، الأسئلة والتلقين، النمذجة والتقليد، التعزيز.

خطوات سير الجلسة:

يسعى هذا النشاط إلى فحص مدى قدرة الأطفال المشاركين على التعبير عن احتياجاتهم الأساسية اليومية مثل احتياجات الأكل والشرب.

1. تبدأ الجلسة بتبادل الترحيب بين الباحثة والمشاركين.
2. تهدف الباحثة هنا إلى تمكين الأطفال المشاركين للتعبير عن احتياجات الأكل واحتياجات الشراب، فتقوم الباحثة هنا برفع بطاقات بيكس المصورة إلى الأعلى وأمام أطفال التوحد وتسمية الأشياء الموجودة على البطاقات، وترديد " شو بدي أكل " ، " شو بدي اشرب" ، لتمكين الطلاب من فهم والتفريق بين احتياج العطش والجوع، بعدها قامت الباحثة برفع الصورة التي اختارتها مع رفع زجاجة الماء التي اختارتها والترديد بصوت مفهوم أمامهم " أنا بدي أشرب مي"، كان لذلك ردود أفعال إيجابية من الطلاب، بسبب قدرتهم على التمييز بين البطاقات المصورة المعروضة أمامهم على الطاولة، الصور الاتية توضح ذلك.

3. تطلب الباحثة من المشاركين أن يختار كل منهم بدوره وسؤاله " شو بدك تشرب"، " شو حابب تاكل"، قام بذلك كل طالب باختيار ما يريده من البطاقات المصورة ويعبر عنه في جملة سليمة، وعلى كل مشارك أن يختار البطاقة التي تناسب اختياره ما يفضله من أكل أو شراب، ثم يقوم كل طفل بدوره بمسك البطاقة المصورة والتعبير عنها بجملة سليمة البناء مكونة من 4 كلمات، على سبيل المثال " أنا بدي أشرب عصير".
4. تم إنهاء الجلسة باختيار كل طفل من المشاركين مع الصورة المطابقة حسب ما يفضلونه، وتم تعزيزهم بتوزيع بلالين ملونة في نهاية الجلسة، مما بث جو المرح بين الأطفال.

التقويم:

- يقوم الباحث بملاحظة سلوكيات المشاركين أثناء تنفيذ النشاطين.
- يقدّم الباحث التعزيز الإيجابي لهم عند إنجازهم لكل عمل.

الجلسة الثالثة

التعرف على أنواع الطعام المرغوب بها وتمييزها بين بعضها

المدة الزمنية للجلسة: 40 دقيقة.

أهداف الجلسة:

تهدف هذه الجلسة إلى تحقيق الاتي:

- طرح وعرض صور على الطاولة للاطعمة التي يتناولها الاطفال بشكل عام والمرغوبة لديهم.
- قدرة كل طفل منهم ذكر ما يحب أن يأكل من خلال تكوين جملة يعبر عن طريقها من خلال بيكس.

الأساليب المستخدمة:

المحاضرة والمناقشة، الدعم، بطاقات بيكس المصورة ، الأسئلة والتلقين، النمذجة والتقليد، التعزيز.

خطوات سير الجلسة:

يسعى هذا النشاط إلى عرض بطاقات مصورة للأطعمة التي يتناولها الأطفال بشكل عام، وفحص مدى قدرة كل طفل بذكر ما يختاره من أكل عن طريق البطاقات المصورة وتكوين جملة من 4 كلمات.

1. تبدأ الجلسة بتبادل الترحيب بين الباحثة والمشاركين.
2. تعمل الباحثة هنا على وضع بطاقات مصورة تعبر عن بعض الأطعمة (أرز، دجاج، خبز، سلطة) أمام المشاركين لمعرفة إذا كانوا يستطيعون التفريق بينهم بالاختيار، وبنفس الوقت وضعت أمامهم الأطعمة ليستطيعوا التطابق بين البطاقات المصورة والطعام الموجود على الطاولة، إذ يهدف هذا التمرين إلى تمكين المشاركين من تشكيل جملة مكونة من (4 كلمات) ومعرفة كيفية تعبيرهم عن أنواع الطعام المرغوب بها، فبدأت الباحثة بدورها طرح مثال عن اختيار ما ترغبه ومسكت البطاقة التي تريد التعبير عنها، وتردد أمام المشاركين بصوت مسموع، على سبيل المثال: (أنا بدي أكل سلطة)، الصور الاتية توضح ذلك.

3. تفسح الباحثة هنا للأطفال المشاركين بالبدء من اليمين اختيار كل طفل بين ما يرغب بأكله والتعبير عنه عن طريق جملة من 4 كلمات وكانت الباحثة تشجع الأطفال باختيار البطاقة حتى يحصل على ما يرغب

به، فمنهم من استطاع التعبير عنها بجملة كاملة (مثل: أنا بدي أكل رز)، والقليل منهم عبر عنهـا (بـدي رز).

4. عملت الباحثة على تشجعيهم على قول جملة كاملة (أنا بدي أكل رز)، فالتعزيز هنا والتصفيق كان بدور عامل معزز للأطفال المشاركين على المحاولة على التعبير وتكوين جملة كاملة لحتى يأكلوا الذي اختاروه.

5. تم اختتام هذه الجلسة بأكل كل طفل ما اختاره من أنواع الأطعمة، وتم تعزيزهم والتصـفيق لهـم بنهايـة الجلسة لمحاولاتهم الايجابية على التعبير عن احتياجاتهم.

التقويم:

- تقوم الباحثة بملاحظة سلوكيات المشاركين أثناء تنفيذ النشاط.
- تقدِّم الباحثة التعزيز الإيجابي لهم عند إنجازهم لكل عمل.

الجلسة الرابعة

التعبير عن رغبة اللعب والتمييز بين بعض المجسمات

المدة الزمنية للجلسة: 40 دقيقة.

أهداف الجلسة:

تهدف هذه الجلسة إلى تحقيق الاتي:

- التدريب على فهم وسائل المواصلات المختلفة (باص، سيارة، طائرة، قطار).
- تعلم الحيوانات عن طريق مجسمات صغيرة وتعلم اسمائها.

الأساليب المستخدمة:

المحاضرة والمناقشة، الدعم، بطاقات بيكس المصورة ، الدعم، لعب الدور، النمذجة والتقليد، التعزيز.

خطوات سير الجلسة:

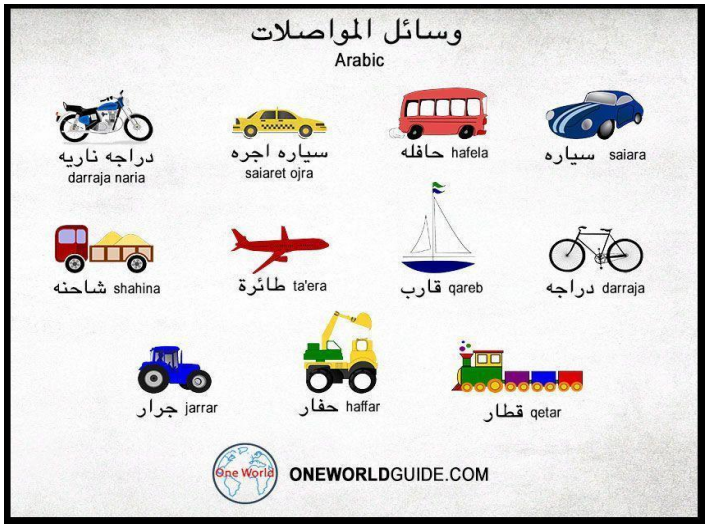
تهدف هذه الجلسة إلى تدريب أطفال التوحد المشاركين على فهم وسائل المواصلات المختلفة وعلى كل طفل أن يختار ما يرغب أن يلعب به، بالإضافة إلى تعلم الحيوانات عن طريق مجسمات صغيرة وتعلم اسمائها.

1. تبدأ الجلسة بتبادل الترحيب بين الباحثة والمشاركين.

2. تقوم الباحثة بالتمهيد للجلسة عن طريق توزيع مجسمات صغيرة لوسائل المواصلات المختلفة على الطاولة أمام الأطفال المشاركين وذكر أسماء وسائل المواصلات أثناء توزيعها، بالإضافة لوجود بطاقات مصـــورة تمثل وسائل المواصلات الموجودة.

3. قامت الباحثة بتطابق كل مجسم من وسائل للمواصلات العامة مع الصورة المطابقة لهـــا مـــن البطاقـــات المصورة ورفعتها أمام الطلاب المشاركين ، وتم ذكر كل منها بجملة سليمة مع إعطاء أمثلة عليها: (أنـــا بحب الطيارة، بحب أسافر بالطيارة)، (أنا بحب الباص، بروح بالباص للمدرسة).

4. أعطت الباحثة الفرصة لكل طالب أن يختار بطاقة مع اللعبة من وسائل المواصلات وتجربة أن يعبر عنها بجملة سليمة مكونة من (4–5 كلمات) وتم طرح عليهم سؤال: "شو بدك تلعب؟" ، تلاحظ الباحثة هنا مدى اختلاف كل مشارك عن الاخر على التعبير عن رغبته باللعب بالمجسم الذي اختاره بجملة كاملة، وذلـــك لاختلاف الفروقات الفردية بينهم، والشكل الاتي يوضح ذلك.

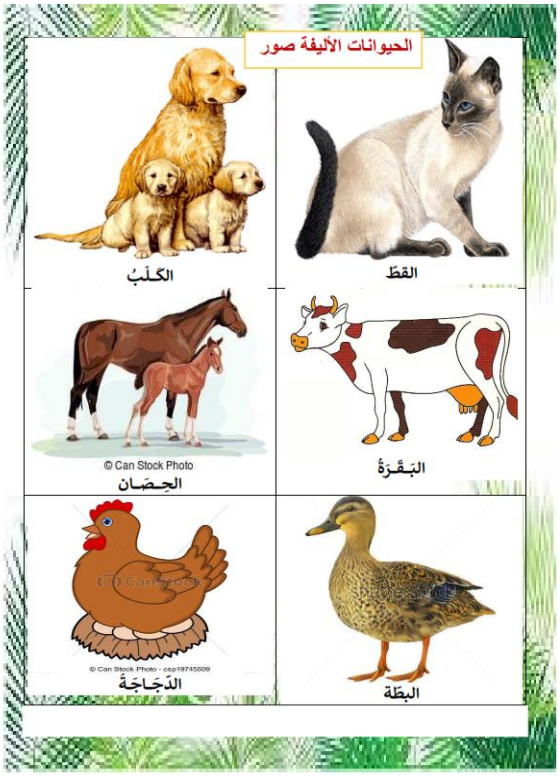


5. فسحت المجال الباحثة فترة 10 دقايق أن يلعبوا الأطفال المشاركين مع بعضهم البعض بوسائل المواصلات المختلفة، بعدها خصصت الباحثة الفرصة لتعلم الحيوانات عن طريق المجسمات وتعلم اسمائها، إذ قامـــت بتوزيع الحيوانات على الطاولة أمام الأطفال المشاركين، ضمن وجود بطاقات مصورة كل منهمـــا تحمـــل صورة واسم الحيوان.

6. قامت الباحثة هنا بذكر اسم كل حيوان موجود على الطاولة، ورفع البطاقة المصورة مع مســـك الحيـــوان وقول اسمه بصوت عالي ومسموع للجميع، وعادت الباحثة بتكرار ذلك مرتين، حتى بدأت بســـؤال كـــل طالب مشارك بدوره " شو حابب تلعب" ، هنا يستطيع الطفل طلب ما يريد اللعب به بشـــكل تلقـــائي عـــن طريق إعطاءه صورة الشيء الذي يرغبه، ويتم تدريب الطفل حتى يستطيع تكوين جملة عن طريق الصور

الذي أمامه " أنا بدي صورة الكلب" وهنا كان مثال على طلب أحد الطلاب المشاركين واستطاعته لتكـــوين جملة سليمة من 4 كلمات، وهذا يدل على فاعلية برنامج بيكس مع أطفال التوحد المشاركين بصورة فعالة.

7. فسحت الباحثة المجال للأطفال حتى نهاية توقيت الجلسة لكي يلعبوا بالحيوانات بين بعضهم وقامت الباحثة بتدريبهم على التعبير عنها بجملة كاملة عن طريق الحث اللفظي وتعزيزهم على قولها والتصفيق لهم.



التقويم:

- تقوم الباحثة بملاحظة سلوكيات الأطفال المشاركين أثناء تنفيذ النشاط.
- تقدم الباحثة التعزيز الإيجابي لهم عند إنجازهم كل نشاط.

الجلسة الخامسة

التعبير عن الصور المتطابقة مع وجود غرض مادي

المدة الزمنية للجلسة: 40 دقيقة.

أهداف الجلسة:

تهدف هذه الجلسة إلى تحقيق الاتي:

- معرفة مدى قدرة الأطفال المشاركين في التعبير عن الصور المتطابقة مع الأغراض المادية.

الأساليب المستخدمة:

المحاضرة والمناقشة مع الطلاب، بطاقات بيكس المصورة ، النمذجة، التكرار، الدعم، النمذجة والتقليد، التعزيز.

خطوات سير الجلسة:

يسعى هذا النشاط إلى الكشف عن قدرات الطفل في مطابقة الصور المختلفة المعروضة عليه في الجلسة مع الاغراض المادية الموجودة في الصف والقدرة على لفظ اسمائها المختلفة، من (موزة، تفاحة، كرة، دائرة، وهكذا).

1. تبدأ الجلسة بتبادل الترحيب بين الباحثة والمشاركين.
2. تقوم الباحثة بتهيأة أطفال التوحد المشاركين من خلال جلوسهم حول الطاولة، مع وجود البطاقات المصورة التي تعبر عن الأغراض المادية التي يراد تعليمها في الصف وفحص مدى قدراتهم على مطابقتها وبدأت الباحثة بتسمية الأغراض المادية عند وضع كل صورة مع الغرض المادي المطابقة لها، (بدءاً بالطابة، موزة، تفاحة، بندورة، خيارة، سيارة، قلم، دفتر).
3. تبدأ الباحثة بعدها بتكرار أسماء الأغراض المادية مع رفع البطاقات المصورة بصوت مرتفع ومسموع، وتقوم الباحثة بتسميتها مرة أخرى مع مراعاة التدرج في الصعوبة ودون تسرع واستعجال في زيادة الصور، حتى تفسح الباحثة المجال للطلاب اختيار ما يرغبون به عن طريق تكوين جملة سليمة كاملة وفهم الأغراض المادية التي عرضت أمامهم على الطاولة.
4. فسحت الباحثة المجال لأطفال التوحد المشاركين كلُ بدوره، أنا يختار ما يريد اللعب به مع تحفيزهم أن يختاره بالحث اللفظي، فيضع الطفل البطاقات التي تعبر عن رغبته باختيار صورة السيارة، ويتم تدريب الطفل على وضع صورة تحمل إشارة السيارة، ليشكل جملة سليمة مثلا " أنا بدي لعبة السيارة "، الصورة الاتية توضح ذلك.

5. استطاع معظم الأطفال المشاركين على إنتاج الجمل والتعبير عن رغبته باللعب بغرض مادي معين عن طريق تكوين جملة بالصور عن ما يريده وتم الحصول عليها بعد التعبير عنه.
6. تم إنهاء الجلسة عن طريق توزيع حلوى صغيرة لجميع الأطفال المشاركين، مما بث جو المرح والسرور بينهم.

التقويم:

- تقوم الباحثة بملاحظة سلوكيات الأطفال المشاركين أثناء تنفيذ النشاط.
- تقدم الباحثة التعزيز الإيجابي لهم عند إنجازهم كل نشاط.

الجلسة السادسة

التعبير عن المشاعر

المدة الزمنية للجلسة: 40 دقيقة.

أهداف الجلسة:

تهدف هذه الجلسة إلى تحقيق الاتي:

تمييز مشاعر الطفل المختلفة (مبسوط، زعلان، معصب)، وتعلم مهارات وصف المشاعر من خلال الصور الدالة عليه.

الأساليب المستخدمة:

المحاضرة والمناقشة مع الطلاب، بطاقات بيكس المصورة، النمذجة، التكرار، الدعم، النمذجة والتعزيز.

خطوات سير الجلسة:

يسعى هذا النشاط إلى تمييز مشاعر الطفل المختلفة (مبسوط، زعلان، معصب)، وتعلم مهارات وصف المشاعر من خلال الصور الدالة عليه، واكتساب القدرة لتكوين جملة للتعبير عن مشاعرهم.

1. تبدأ الجلسة بتبادل الترحيب بين الباحثة والمشاركين.
2. تقوم الباحثة بالتمهيد للجلسة عن طريق جلوسها بجانب الأطفال المشاركين حول الطاولة، بدءاً بالنشاط المراد تنفيذه، حيث تكون هنا بطاقات بيكس تحمل مشاعر الطفل المختلفة، من (مبسوط، زعلان، معصب، جعان، نعسان، تفاجئ).

3. تبدأ الباحثة بطرح الصور على الاطفال بشكل عام، وتشرح لهم الانفعالات الموجودة في كل صورة من البطاقات المصورة، تتحدث عن كل بطاقة بجملة كاملة وسليمة، حتى تصل المعلومة للأطفال ويفهموا الحالة الانفعالية لكل صورة، تطرح الباحثة صور بيكس وترفعها أمام أنظار جميع الأطفال المشاركين، على سبيل المثال (الولد اليوم زعلان، الولد نعسان بده ينام)، نستنتج هنا أن الباحثة شرحت لهم كل بطاقة مع إعطاء جملة تحمل معنى الحالة الانفعالية للولد الذي في الصورة، وبعدها تطلب الباحثة من الأطفال كل بدوره أن يختار بطاقة معينة ويعبر عن الحالة الانفعالية الموجودة في الصورة.

4. شارك طلاب التوحد المشاركين بصورة فعالة خلال الجلسة بمساعدة الباحثة وعملت معهم على الحث اللفظي لتكوين جملة سليمة وكاملة من 4 كلمات لكي يضعوها على الشريط ويعبروا عنها لفظياً واستطاع كل طفل بتشكيل جمل مختلفة، بالإضافة إلى تمثيل الباحثة بوجهها إلى بعض المشاعر في وجهها مما أثار جو الفرح المتعة بين الطلاب، وشاركوا بشكل فعال أكثر، إذ نجدهم نجحوا في بناء الجمل بشكل فعال، توضح الصور الاتية بعض الصور التي عرضت على البطاقات المصورة.






5. شارك معظم أطفال التوحد المشاركين في التعبير عن بطاقات بيكس أمامهم، من بعض الجمل التي قيلت خلال الجلسة كانت: (الولد اليوم معصب، الولد كتير مريض، البنت خايفة من الكلب، الولد نعسان بده ينام، الولد ببكي وزعلان)، كانت الباحثة تشجع المشاركين خلال إجابتهم ومحاولاتهم لتكوين جمل سليمة وكاملة.

6. تم إنهاء الجلسة من خلال تعزيز الأطفال بتوزيع بلالين بألوان مختلفة، لتعزيزهم على المشاركة الفعالة خلال الجلسة.

التقويم:

- تقوم الباحثة بملاحظة سلوكيات الأطفال المشاركين أثناء تنفيذ النشاط.
- تقدم الباحثة التعزيز الإيجابي لهم عند إنجازهم كل نشاط

الجلسة السابعة

اكتساب مهارات تمييز أعضاء جسم الانسان

المدة الزمنية للجلسة: 40 دقيقة.

أهداف الجلسة:

تهدف هذه الجلسة إلى تحقيق الاتي:

اكتساب مهارات تمييز أعضاء جسم الانسان.

الأساليب المستخدمة:

المحاضرة والمناقشة مع الطلاب، صور بيكس المصورة ، النمذجة، التكرار، الدعم، النمذجة والتقليد، التعزيز.

خطوات سير الجلسة:

يسعى هذا النشاط إلى اكتساب مهارات تمييز أعضاء جسم الانسان، من بطن، رقبة، رأس، عيون،..الخ، والاستجابة عن اسم العضو الموجود بالصورة بإشارة كل طفل على العضو الموجود في الصورة في جسمه الخاص.

1. تبدأ الجلسة في تبادل الترحيب بين الباحثة والمشاركين.

2. تعمل الباحثة في التمهيد للجلسة من خلال الجلوس حول الطاولة مع الأطفال المشاركين، حيث تبدأ الباحثة في توزيع صورة توضيحية كبيرة تبين بها جميع أعضاء جسم الانسان.

3. تحدثت الباحثة بصوت مسموع ومرتفع وهي تشير لكل عضو من أعضاء الجسم من خلال الإشارة عليها في الصورة الكبيرة وبنفس الوقت تتحدث اسم كل عضو بدءاً من (الشعر، الرأس، العيون، الأنف، وصولاً إلى القدمين) ، بعدها أصبحت الباحثة تردد كل عضو وتنادي على الطلاب لكي يكرروا لفظه ويشيروا على كل عضو في الإشارة عليه في أجسامهم، وكان تفاعلهم ممتاز وهم يعيدون اسماء أعضاء جسم الانسان.

4. شرحت الباحثة بعض وظائف أعضاء الجسم عند الإنسان، لكن لم تركز عليهم بشكل كبير، بسبب شرح المعلمة عن وظيفة كل عضو من جديد في نفس فترة قياس البرنامج العلاجي (بيكس)، فاكتفت بأهمية إشارتهم والتعبير عن اسم كل عضو في أجسامهم.

5. أنهت الباحثة الجلسة عن طريق التصفيق لهم وإعطاءهم لعبة تفعيلية من ألعاب الصف.

تقييم الجلسة:

راقبت الباحثة سلوك أطفال التوحد بينما كانوا يحاولون تكوين وإكمال الجمل. فمثلًا، نجح الطلاب في تكوين الجمل الصوتية، مثل: "هذه ساقي"، "هذا أنفي"، وعززت الباحثة جهودهم عندما نجحوا في تكوين جملة و تواصلت معهم عبر توزيع قطع الليجو. ثم طلبت التقييم من معلمي الأطفال وكان ذلك ممتازًا (5/5).

الجلسة الثامنة

فهم النشاطات اليومية وتسميتها

المدة الزمنية للجلسة: 40 دقيقة.

أهداف الجلسة:

تهدف هذه الجلسة إلى تحقيق الاتي:

- معرفة وتسمية الأفعال التي يمارسونها (ركض، قفز، لعب).
- تكوين مخزون للأفعال ومحاولة فهمها ليعبر عنها بجملة كاملة.

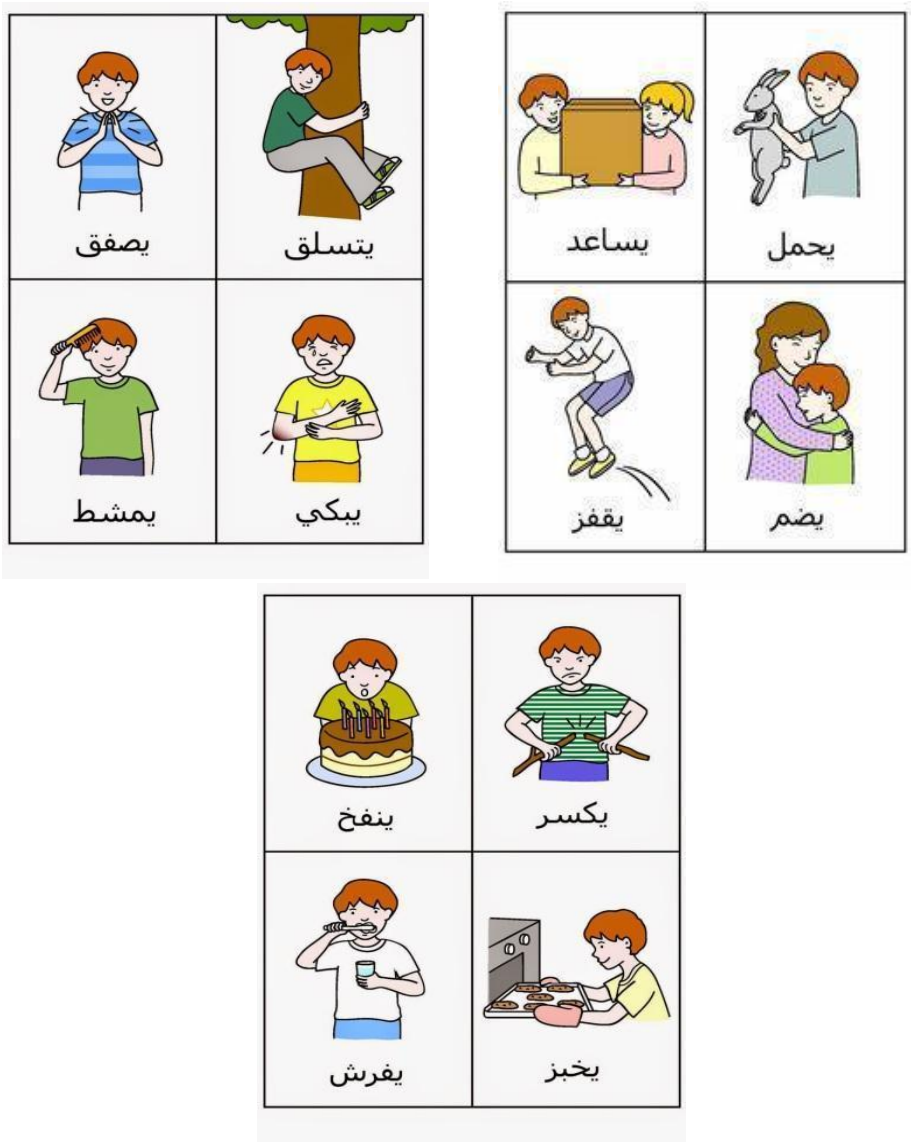
الأساليب المستخدمة:

المحاضرة والمناقشة مع الطلاب، بطاقات بيكس المصورة ، النمذجة، التكرار، الدعم، النمذجة والتقليد، التعزيز.

خطوات سير الجلسة:

يسعى هذا النشاط إلى معرفة وتمييز الأفعال التي يمارسونها الأطفال بشكل معتاد، ليستطيع كل منهم تشكيل مخزون للأفعال ومحاولة فهم البطاقات المصورة ليعبر عنها بجملة سليمة.

1. بدأت الجلسة بتبادل الترحيب بين الباحثة والمشاركين.
2. عملت الباحثة على تمهيد الأطفال المشاركين لبدأ الجلسة بالجلوس على شكل دائري على الأرض في الساحة الخارجية، ذلك بسبب تحفيز الطلاب على وجود مكان مفتوح للقيام ببعض النشاطات التي سيتم طرحها خلال الجلسة بالهواء الطلق.
3. قامت الباحثة بمسك البطاقات المصورة التي تحمل صورة والفعل الموجود في كل منها على حدى، ووقفت أمام الطلاب وأصبحت تتحدث بصوت مسموع للجميع عن كل صورة وبنفس الوقت تقلد ما تدل عليه الصورة حتى تستطيع إيصال الفكرة للطلاب بشكل سلس، على سبيل المثال قامت المعلمة بالإشارة إلى أحد الصور الموجودة وقلدت الحركة لتطلب من الطلاب تقليد الحركة (التصفيق) وكانت تنادي تزامناً "أنا بحب أصفق للطالب الشاطر"، وكذلك الأمر على تسمية والقيام بفعل اخر وكان الأطفال مندمجين بشكل كبير خلال النشاط، الصورة الاتية توضح ذلك.



4. قامت الباحثة بتشجيع الطلاب على تشكيل جملة سليمة وكاملة مكونة من 4-3 كلمات، بدأ كل طفل بدوره بالتعبير عن البطاقات المصورة وتسمية الأفعال لكل بطاقة من البطاقات، عملت الباحثة أيضاً على تشجيعهم على مسك البطاقة والتعبير عنها بجملة كاملة مع المحاولة لتقليد الحركة أمام باقي الطلاب، وتشجعهم أيضاً على تقليد حركة زملائهم لكي يتعلموا من بعضهم البعض، فتجد معظم الأطفال التوحد المشاركين عبروا عن النشاطات اليومية بشكل جيد، على سبيل المثال (الولد بفرشي أسنانه، الولد بخبز العجينة، الولد بحب يساعد أمه) وهكذا.

5. تم إنهاء الجلسة بعد مشاركة الاطفال الفعالة خلال الجلسة، وفسحت الباحثة المجال للطلاب للعب في الساحة الخارجية لتعزيزهم على القياط بالنشاط.

التقويم:

- تقوم الباحثة بملاحظة سلوكيات الأطفال المشاركين أثناء تنفيذ النشاط.
- تقدم الباحثة التعزيز الإيجابي لهم عند إنجازهم كل نشاط.

الجلسة التاسعة

اكتساب مهارات العلاقات بين الأشياء

المدة الزمنية للجلسة: 40 دقيقة.

أهداف الجلسة:

تهدف هذه الجلسة إلى تحقيق الاتي:

التعرف على الصور التي تحمل علاقات بين الأشياء المختلفة وخاصة الحيوانات.

الأساليب المستخدمة:

المحاضرة والمناقشة مع الطلاب، بطاقات مصورة ، النمذجة، التكرار، الدعم، النمذجة والتقليد، التعزيز.

خطوات سير الجلسة:

يسعى هذا النشاط إلى التعرف على العلاقات بين الأشياء المختلفة وخاصة الحيوانات وتكوين جملة عنها، مثل البقرة تأكل العشب، بهدف فهم ماذا يأكل كل من الحيوانات الموجودة ضمن صور بيكس التعليمية.

1. تبدأ الجلسة بتبادل الترحيب بين الباحثة والأطفال المشاركين.
2. تطلب الباحثة من الطلاب الجلوس حول الطاولة للقيام بالنشاط ، حيث تكون بطاقات بيكس تحمل صور مختلفة لبعض الحيوانات وارتباطها بنوعية الأكل الذي تأكله، فبدأت الباحثة بالترديد بصوت عالي ومسموع لجميع الاطفال المشاركين، بنفس الوقت ترفع كل بطاقة تحمل صورة حيوان معين مع نوعية الاكل الموجود في الصورة، على سبيل المثال (القرد بياكل الموزة، الأرنب بياكل الجزرة).
3. طلبت الباحثة من الطلاب المشاركة في النشاط، وشجعت الطلاب كلُ بدوره على القيام بتكوين جملة كاملة وسليمة مكونة من 3–4 كلمات، وجدت الباحثة أنه لم يستطع كل الأطفال المشاركين فهم وتكوين جملة كاملة ضمن صور بيكس، لكن بالمقابل هناك عدد قليل من المشاركين الذين استطاعوا تكوين الجمل بشكل كامل وسليم، بالاضافة إلى مسك الصورتين بهدف ربط بين الصورتين وفهم العلاقات بين الحيوان والطعام

الذي يأكله، على سبيل المثال من بعض عبارات الطلاب المشاركين خلال الجلسة كانت: (الأرنب بحب ياكل جزر، الكلب باكل عظم، البسة بتشرب الحليب)، الصورة الاتية توضح ذلك.

4. تم إنهاء الجلسة من خلال توزيع بلالين بألوان مختلفة، لتعزيزهم على مشاركاتهم خلال جلسة اليوم.

التقويم:

- تقوم الباحثة بملاحظة سلوكيات الأطفال المشاركين أثناء تنفيذ النشاط.
- تقدم الباحثة التعزيز الإيجابي لهم عند إنجازهم كل نشاط.

الجلسة العاشرة

قامت الباحثة بتوزيع استبيان القياس البعدي لفحص مدى فاعلية برنامج بيكس على طلاب التوحد، وتم الاستجابة عليه من قبل معلمات الصف، تعاونوا المعلمات بشكل ممتاز مع الباحثة خلال فترة البرنامج في المدرسة، وتم بمساعدتهم توزيع هدايا رمزية على جميع طلاب الصف واللعب معهم ببعض ألعاب الصف.

المدة الزمنية للجلسة: 30 دقيقة.

أهداف الجلسة:

تهدف هذه الجلسة إلى تحقيق الاتي:

- تعزيز وشكر الأطفال على المشاركة وتقديم الهدايا لهم واختتام البرنامج التدريبي.

- إكمال المعلمين الإختبار البعدي.

الأساليب المستخدمة:

الهدايا لتعزيز ودعم الأطفال، وتسليم الإستبانة للمعلمين.

خطوات سير الجلسة:

رحبت الباحثة بالمعلمين والأطفال وشكرتهم على التزامهم واهتمامهم بالحضور، ثم قدمت الهدايا للأطفال. وذكرت الباحثة الحاضرين أنها الجلسة الأخيرة واكمل المعلمون الاختبار البعدي.

تقييم الجلسة:

كان التفاعل بين المعلمين والأطفال في الجلسة العاشرة ممتاز، وتم تطبيق الإختبار البعدي.

Appendix C

Questionnaire in Arabic

Questionnaire to study the variables that affect the interaction of autistic children in the home and school environment.

استبيان لدراسة المتغيرات التي تؤثر على تفاعل أطفال التوحد في البيئة المنزلية والمدرسية.

بعد السلام والتحية:

إلى ذوي الشأن:

تسعى الباحثة إلى قياس بعض جوانب التواصل اللفظي وغير اللفظي لدى عينة من أطفال التوحد في الضفة الغربية والقدس، بالإضافة إلى دراسة المتغيرات التي تؤثر على تفاعل أطفال التوحد في البيئة المنزلية والمدرسية، لذا يرجى الإجابة عن فقرات الاستبانة بأمانة وموضوعية، إذ ستستخدم البيانات لغايات البحث العلمي فقط وبخصوصية تامة.

شاكرةً لكم حسن تعاونكم

الطالبة: أسيل قواسمي

جامعة النجاح الوطنية/ نابلس- فلسطين

جنس الطفل: _____

عمر الطفل:_____

1. **مستوى تشخيص التوحد:**
   - التوحد الخفيف
   - التوحد المتوسط
   - التوحد الشديد

2. **مدة إقامة الطفل في المؤسسة التعليمية:**

- أقل من 6 أشهر
- 6 أشهر إلى سنة
- أكثر من سنة

3. **هل يوجد إعاقة أخرى في المنزل**

- نعم
- لا

إلى المعلم/ المعلمة الفاضلة

يعرض عليكم مجموعة من العبارات، تعبر عن مهارات التواصل اللفظي وغير اللفظي والاجتماعي لدى أطفال التوحد من عمر (7-4) سنوات، أثناء تفاعلكم معهم، أو مع الأشخاص الأخرين في المواقف المختلفة، والمطلوب من سيادتكم:

1. قراءة كل عبارة من عبارات المقياس بدقة حتى تكون على دراية كافية بها جميعاً
2. وضع علامة (x) في إحدى الاستجابات الثلاث الموجودة أمام العبارة التي ترى أنها تنطبق على الطفل/الطفلة، هذه الاستجابات هي: دائماً – أحياناً – نادراً حيث أن:

- دائماً: بمعنى أنها تحدث كثيراً
- غالباً: بمعنى أنها تحدث في أغلب الأحوال والأوقات
- أحياناً: بمعنى أنها تحدث بدرجة متوسطة
- نادراً: بمعنى أنها تحدث بدرجة قليلة
- أبداً: بمعنى أنها لا تحدث مطلقاً

3. لا تترك عبارة بدون وضع استجابة، فليست هناك إجابة صحيحة وأخرى خطأ.

مثال:

عليمات تقييم مهارات التواصل لدى الأطفال ذوي اضطراب طيف التوحد

Instructions for Assessing Communication Skills in Children with Autism

م	العبارات	دائماً	غالباً	أحياناً	نادراً	أبداً
1	يبدأ بالحديث معك أو مع الآخرين					

ملاحظة: هذه البيانات تستخدم من أجل تطبيق برنامج إرشادي باستخدام أنشطة اللعب لتحسين المهارات التواصلية والحسية لدى الأطفال التوحد.

الاستبيان بالعربية

رقم العبارة	العبارات	دائماً	غالباً	أحياناً	نادراً	أبداً
1.	يرد على الأسئلة التي توجه إليه من قبل الأخرين					
2.	يستطيع التواصل البصري مع الآخرين أثناء الحديث					
3.	يستطيع إظهار تعبيرات الوجه في التواصل مع الآخرين					
4.	يشارك في محادثة بسيطة مع الآخرين ويبدأ بها					
5.	ينظر عن النداء عليه باسمه					
6.	يستطيع أن يتفاعل مع الأخرين بسهولة					
7.	يستطيع المبادأة بطلب شيء مرغوب أو احتياجاته الشخصية لفظياً					
8.	يستخدم إشارات معينة لفظية للتعبير عن احتياجاته					
9.	يتعاون مع أقرانه ويسعى لتكوين صداقات معهم					
10.	يستطيع نطق الحروف من مخارجها بطريقة صحيحة					
11.	يعبر عن احتياجاته عن طريق (عرض صورة الشيء المطلوب على شخص ما، إحضارها بنفسه، يجذب أحد الأشخاص(					
12.	يتقبل التلامس الجسدي من الأخرين					

13.	يستطيع إصدار بعض المقاطع الصـــوتية والكلمـــات بالتقليد					
14.	يفهم تعبيرات الوجه					
15.	يبادل الآخرين الابتسام					
16.	يستطيع إصدار الكلمات بشكل واضح					
17.	يستخدم الإشارات للتعبير عن القبول والرفض					
18.	يستطيع المشاركة في اللعب بشكل جماعي					
19.	يكرر كلمات أو جمل مما سبق سماعها في مواقـــف سابقة					
21.	لا يبالي لما يحدث للأخرين من حوله					
22.	يأتي بالكلمات المناسبة والتي يفكر فيها بنفسه وأثناء الحديث مع الآخرين					
23.	يظهر الطفل مشاعر (الحزن–الفرح– الغضـــب...) تبعاً للمواقف التي يتعرض لها					
24.	يقبل الطفل تكليفه بمهمة أو نشاط من قبل معلمة					
25.	يستطيع تسمية الأشياء المحيطة به سواء فـــي بيئتـــه المدرسية أو بيئته المنزلية					
26.	يستخدم إيماءات الرأس في التواصل مع الأخرين					
27.	يصدر منه السلوكيات الغريبة في وجود الغرباء					
28.	يستخدم الضمائر بشكل صحيح					
29.	يستطيع تقليد بعض المهـــارات الحركيـــة الكبـــرى (التصفيق – الوقوف(...					
30.	ينتظر دوره في اللعب الجماعي مع أقرانه					
31.	يتعرف ويسمي بعض الأشياء عن عرض صـــورها عليه					
32.	يستطيع تقليد بعض الحركات باستخدام أدوات (الخيط على المنضدة بالقلم(					
33.	يتبع تعليمات اللعبة التي يشارك فيها					
34.	يعبر عن القبول والرفض ب (أه، لا(					
35.	ينفذ بعض الأوامر البسيطة (هـــات/ي – تعـــال/ي– افتح/ي– خد/ي(					
36.	يستطيع الطفل أن يلوح "باي" مقلداً الآخـــرين عـــن انتهاء النشاط الجماعي					

Appendix D

Questionnaire in English

Statement Number	Statements	Always	Often	Sometimes	Rarely	Never
1.	Responds to questions directed at him/her by others					
2.	Can maintain eye contact with others during conversation					
3.	Can show facial expressions when communicating with others					
4.	Participates in and initiates simple conversations with others					
5.	Responds when called by name					
6.	Can interact with others easily					
7.	Can initiate requests for desired items or personal needs verbally					
8.	Uses specific verbal cues to express needs					
9.	Cooperates with peers and seeks to form friendships with them					
10.	Can pronounce letters correctly					
11.	Expresses needs by showing a picture of the desired item, bringing it, or grabbing someone					
12.	Accepts physical contact from others					
13.	Can imitate some sounds and words					
14.	Understands facial expressions					
15.	Smiles back at others					
16.	Can pronounce words clearly					
17.	Uses gestures to express acceptance or rejection					
18.	Can participate in group play					
19.	Repeats words or phrases heard in previous situations					
20.	Does not care about what happens to others around him/her					
21.	Finds appropriate words during conversation					
22.	He comes up with appropriate words on his own while conversing with others.					
23.	The child shows emotions (sadness, happiness, anger...) according to the situations they encounter					
24.	The child accepts being assigned a task or activity by the teacher.					
25.	Can name surrounding objects in his/her school or home environment					

26.	Uses head gestures to communicate with others					
27.	Displays strange behaviors in the presence of strangers					
28.	Uses pronouns correctly					
29.	Can imitate some gross motor skills (clapping, standing, etc.)					
30.	Waits for his/her turn in group play with peers					
31.	Recognizes and names objects when shown pictures of them					
32.	Can imitate certain movements using tools (drawing a line on a table with a pencil)					
33.	Follows the rules of the game he/she is participating in					
34.	Expresses acceptance or rejection by saying "Yes" or "No."					
35.	Follows simple commands (bring, come, open, take)					
36.	The child can wave "goodbye" imitating others when a group activity ends.					

Appendix E

Facilitate the student's task

An-Najah
National University

جامعة
النجاح الوطنية

2021-11-27

حضرة السيد المربي الفاضل الأستاذ إيهاب الكردي المحترم – مدير روضات السنابل للتعليم الخاص

تحية طيبة وبعد،

الموضوع: تسهيل مهمة

ترغب الطالبة **أسيل جمال أحمد قواسمي** فحص إمكانية تطبيق برنامج علاجي جمعي على أطفال التوحد في مؤسستكم الموقرة، وذلك لاستكمال العمل على رسالة الماجستير الموسومة بـ "**فاعلية برنامج بيكس (PECS) في تحسين مهارات التواصل لدى أطفال التوحد**"، ويتطلب ذلك حصر الأطفال الذين سيطبق عليهم البرنامج، وإجراء قياسين قبلي وبعدي، ومن المفترض أن تطبق الطالبة البرنامج على عينة من (5 الى 8) أطفال كمجموعة تجريبية.

والطالبة المذكورة إحدى طالبات برنامج ماجستير علم النفس الإكلينيكي في جامعة النجاح الوطنية وبإشراف د. فاخر الخليلي، وعليه أرجو من حضرتكم مساعدة الطالبة المذكورة قدر الإمكان.

وتقبلوا فائق الشكر والاحترام

مشرف الطالبة

د. فاخر الخليلي

قسم علم النفس والإرشاد النفسي
Psychology and counseling

Appendix F

Tables

Table 11

The results of paired samples t-Test of the differences between pre-test and post-test of communication skills in the experimental group

Dependent variables	Mean	SD_D	T-value	df	Sig.	Effect size
VCSS	-1.29	0.83	-4.91	9	.000**	1.55
NVCSS	-1.18	0.41	-8.63	9	.000**	2.87
SCSS	-1.58	0.54	-9.17	9	.000**	2.92
SCSS	-1.34	0.36	-11.88	9	.000**	3.72

**(p <.01).

Table 12

Testing the normality of the responses in communication skills in the post-test a by the Shapiro-Wilk test (n = 10)

Group type	Dependent variables	Shapiro-Wilk test		
		Statistic	df	Sig.
Control (n = 10)	VCSS	.932	9	.473
	NVCSS	.941	9	.559
	SCSS	.900	9	.217
	SCSS	.905	9	.250
Experimental (n= 10)	VCSS	.873	9	.057
	NVCSS	.909	9	.271
	SCSS	.885	9	.150
	SCSS	.926	9	.412

Table 13

Means and standard deviations of communication skills in the post-test according to group type, age, autism level, residency in the school, and presence of another disability

Independent variable		Dependent variables			
		VCSS	NVCSS	SCSS	SCSS
Group type	Control	1.18±0.43	1.43±0.27	1.43±0.24	1.27±0.14
	Experimental	2.03±1.07	2.58±0.52	3.04±0.60	2.55±0.67
Age	5 years old	1.91±0.55	2.15±0.66	2.44±1.07	2.12±0.76
	6 years old	1.42±1.03	2.08±0.92	2.27±1.10	1.86±0.98
	7 years old	1.44±1.13	1.75±0.55	1.96±0.59	1.73±0.70
Autism level	Mild	1.49±1.02	2.19±0.77	2.41±1.17	2.00±0.97
	Moderate	1.49±0.87	2.06±0.95	2.43±1.07	1.95±0.93
	Severe	1.78±0.95	1.83±0.52	1.96±0.66	1.82±0.67
Residency in the school	< 6 months	2.22±0.88	2.80±0.47	3.44±0.46	2.82±0.58
	≥ 6 months	1.50±0.89	1.87±0.66	2.02±0.84	1.75±0.73
Presence of another disability in the home	Yes	2.07±0.83	2.19±0.90	2.46±1.05	2.23±0.91
	No	1.22±0.81	1.86±0.52	2.05±0.85	1.66±0.63

Table 14

Five-way MANCOVA results of differences in communication skills in the post-test according group type, age, autism level, residency in the school, and presence of another disability

Source	Dependent Variable	Type III Sum of Squares	Df	Mean Square	F	Sig.	Partial Eta Squared (η2)
Group type	VCSS	1.889	1	1.889	9.250	.019*	.569
	NVCSS	2.198	1	2.198	28.369	.001**	.802
	SCSS	4.575	1	4.575	42.262	.000**	.858
	ACCSS	3.350	1	3.350	46.487	.000**	.869
Age	VCSS	2.109	2	1.055	5.164	.042*	.596
	NVCSS	.214	2	.107	1.381	.312	.283
	SCSS	.020	2	.010	.092	.913	.026
	ACCSS	.307	2	.153	2.127	.190	.378
Autism level	VCSS	.381	2	.190	.933	.437	.210
	NVCSS	.327	2	.164	2.110	.192	.376
	SCSS	.029	2	.015	.135	.876	.037
	ACCSS	.099	2	.049	.686	.535	.164
Residency in the school	VCSS	.072	1	.072	.351	.572	.048
	NVCSS	.032	1	.032	.407	.544	.055
	SCSS	.082	1	.082	.760	.412	.098
	ACCSS	.00009	1	.00009	.001	.973	.000
Presence of another disability	VCSS	1.022	1	1.022	5.005	.060	.417
	NVCSS	.139	1	.139	1.792	.222	.204
	SCSS	.003	1	.003	.027	.874	.004
	ACCSS	.174	1	.174	2.413	.164	.256
Pre-test	VCSS	.001	1	.001	.004	.952	.001
	NVCSS	.023	1	.023	.297	.603	.041
	SCSS	.011	1	.011	.099	.763	.014
	ACCSS	.009	1	.009	.130	.729	.018

**(p <.01), *(p <.05).

جامعة النجاح الوطنية
كلية الدراسات العليا

فاعلية برنامج نظام التواصل بتبادل الصور (PECS) في تطوير مهارات الاتصال لدى اطفال اضطراب طيف التوحد

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قدمت هذه الرسالة استكمالا لمتطلبات الحصول على درجة الماجستير في علم النفس الاكلينيكي،
من كلية الدراسات العليا، في جامعة النجاح الوطنية، نابلس – فلسطين.

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الملخص

خلفية الدراسة: اضطراب طيف التوحد (ASD) هو اضطراب نمائي معقد يتميز بصعوبات مزمنة في التواصل الاجتماعي واهتمامات محدودة، وسلوك متكرر يؤثر على الأداء اليومي. أظهرت العديد من الدراسات أن نظام التواصل بتبادل الصور (بيكس) هو أحد مكونات التواصل المعزز البديل، والذي يساعد في تعليم مهارات التواصل الوظيفية، ويعزز تطور اللغة والسلوكيات الاجتماعية المقبولة، ويحد من السلوكيات الإشكالية، من خلال برنامج تعليمي مكون من ست مراحل سيتم مناقشتها في هذه الأطروحة.

المنهجية: تتبنى الدراسة المنهج شبه التجريبي، حيث تم اختيار مجموعة ضابطة ومجموعة تجريبية خضعتا لاختبار قبلي وبعدي لاختبار تأثير المتغير المستقل (برنامج مجموعة نظام التواصل بتبادل الصور) على المتغير التابع (مهارات الاتصال – اللفظية وغير اللفظية والاجتماعية) لدى الأطفال المصابين بالتوحد. تم استخدام تصميم مجموعتين متكافئتين. وبموافقة الآباء، تم اختيار 20 طالبًا (10 لكل مجموعة) تم تشخيصهم باضطراب طيف التوحد، تتراوح أعمارهم بين 4–7 سنوات، كعينة للدراسة. تم اختبار هذه المهارات من خلال إنشاء مقياس يهدف إلى تقييم المهارات اللفظية وغير اللفظية. تم استخدام نظام بيكس مع المجموعة التجريبية، بينما لم يتم إجراء أي تدخل مع المجموعة الضابطة. تم إجراء الاختبار القبلي والبعدي لكلتا المجموعتين لتقييم قدرة الأطفال المصابين بالتوحد على التواصل قبل وبعد استخدام نظام بيكس، بهدف معرفة النتائج وتحليلها.

النتائج: عكست النتائج أن نظام التواصل بتبادل الصور (بيكس) يمكن أن يرفع مستوى مهارات التواصل لدى الأطفال المصابين بالتوحد. حيث ارتفعت بشكل ملحوظ المهارات اللفظية وغير اللفظية والتواصل الاجتماعي

لديهم. بالإضافة إلى ذلك، أظهرت النتائج أن الأطفال المصابين بالتوحد الأصغر سنًا استفادوا أكثر من أقـــرانهم الأكبر سنًا. كما أثبتت النتائج أن التدخل المبكر باستخدام نظام بيكس له نتيجة إيجابية، حيث يركز علـــى رفـــع وتيرة وشكل وغرض أفعال التواصل لاكتساب مهارات مختلفة في سن مبكرة وتوظيف المهارات المكتسبة فـــي بيئات متعددة مع تطوير قدرات التواصل اللفظي وغير اللفظي.

الكلمات المفتاحية: اضطراب طيف التوحد، نظام التواصل بتبادل الصور (بيكس)، مهارات التواصل، التواصل اللفظي وغير اللفظي.