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teaching strategies that enable children with autism spectrum disorder " Study using the Meta- analysis method"

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ABSTRACT: Augmentative and alternative communication (AAC) contains all methods of communication (other than oral speech) that are used to express thoughts, needs, wants, and ideas. Autism spectrum disorder (ASD) is characterized by difficulties in communication, language, and social communication (Ganz, Earles-Vollrath, Heath, Parker, Rispoli, & Duran, 2012). AAC offers the potential to provide children who have complex communication needs including children with ASD access to the magic and power of communication. This paper is intended to review the research on methods used to identify appropriate teaching strategies that enable children with autism spectrum disorder (ASD) to achieve their communication skills through augmentative and alternative communication (AAC).

Keywords: augmentative and alternative communication (AAC), children, communication, design early intervention, autism spectrum disorder (ASD), and teaching strategy.

Introduction

It is essential to consider the importance of communication skills for young children as one of the major developmental milestones. During the early stages of child development typically gain speech and language skills that help them to express needs and wants, interact socially with adults and peers, expand their conceptual development, and develop the foundation for more advanced language and literacy skills (Light & Drager, 2007).

Research found that children with ASD develop communication skills at a different rate than their typically developing peers, and some children with ASD will never require speech skills as crucial tools to express themselves effectively (Ganz et al., 2012). Children with ASD differ from their peers when they want to express their daily gratification tasks, and studies suggested that perhaps children with ASD do not use language to interact and engage with others in the same way as their peers during play time or social interaction (Winsler, Abar, Feder, Schunn, & Rubio, 2007). For example, children with ASD may quote long complicated words or phrases without understanding their meaning, but generally, children with ASD have

weaknesses in verbal and non-verbal communication skills such as receptive and expressive language (Winsler et al., 2007).

In some cases, children with ASD are diagnosed with severe language problems, which include a difficulty with developing verbal communication speech. Research has shown that some specific speech difficulties are more common in children with ASD than in children with other disabilities (Winsler et al., 2007). Among these are echolalia, which is when children repeat words or phrases spoken by parents or teachers immediately or later (Travis & Geiger, 2010).

Moreover, some children with ASD may never develop verbal language skills; therefore, ultimate goal for them is to acquire gestural communication such as the use of Sign Language. For other children with ASD, the goal is to communicate by means of symbol systems in which pictures are used to convey thoughts (Douglas, McNaughton, & Light, 2013). Symbol systems can range from picture boards or cards to sophisticated electronic devices that generate speech using buttons represent common items or actions (Ganz et al., 2012). Children who cannot effectively use conventional speech to communicate may use augmentative and alternative communication (AAC) systems to compensate for lack of speech in order to replace or augment unintelligible speech (Ganz et al., 2012).

AAC is a group of tools and strategies that individuals with complex communication needs use to augment or replace verbal language (Binger, Kent-Walsh, King, Webb, & Buenviaje, 2017). In general, communication is multimodal, and includes speech, shared glances, texts, gestures, facial expressions, touch, sign language, symbols and pictures (Sonnenmeier, McSheehan & Jorgensen, 2005). AAC options can be unaided or aided. Unaided AAC systems do not require external equipment that includes gestures and manual sign language. In contrast, aided AAC systems require the use of tools or equipment such as pointing at a picture on a communication board, writing on paper, or activating a speech-generating device (Ganz et al., 2012).

The theory suggests that a child, who relies on AAC as a primary means of communication, needs appropriate strategies and supports to learn how to use AAC device (Sundqvist & Ronnberg, 2010). The basic belief of this theory is that support needs should come from all individuals who interact with children with ASD using AAC. Parents, family members, and teachers are often the primary communication partners for young children to help them learn how to use AAC, and they have instrumental roles in their child's development and functional communication (Sundqvist & Ronnberg 2010).

However, in some case parents and teachers of children with ASD are concerned with the use of AAC that they think it will affect their ability to speak by using words "verbally" (Stahmer, & Ingersoll, 2004). However, research has shown that many AAC interventions facilitate speech production, and Kasari et al.

(2014) found that applied speech generating device (SGD) might promote spoken language outcomes by increasing the frequency of the communication and spontaneous communication including different types of words and functions. Thus, AAC may help to increase the spontaneous language, verbal commenting and novel word use for children with ASD.

It is fundamental that young children with ASD learn effective means of communication, but it is the question of which strategy can be used to support the AAC usage which remains unclear. Therefore, the subject of this review is to investigate which AAC interventions are highly effective for young children with ASD. This paper will consider effectiveness in terms of an appropriate access to AAC systems along with instruction that leads to improve linguistic, operational, social, and strategic skills required to communicate effectively (Light & Drager, 2007).

PURPOSE AND RESEARCH QUESTION

As mentioned above, there are several instructional techniques that are used to teach children with ASD to communicate using AAC (e.g., modeling). Emerging research suggests that children with ASD can demonstrate rapid improvements in predictions of multi-symbol messages with preschoolers and young school-age children with ASD using AAC (Kent-Walsh, Binger, & Buchanan, 2015). Beyond determining the overall impact of AAC for the young children with ASD, it is necessary to determine the impact of AAC on different types of targeted behavioral outcomes including increased AAC usage and speech. Single-case research design (SCRD) demonstrated that AAC could be effective in improving communication skills (e.g., Nunes, & Hanline, 2007); social interaction (e.g., Spencer et al., 2008); and academics (e.g., Ahlgrim-Delzell et al., 2016). Although there are increasing numbers of children with ASD, some learn how to use speech because of early effective intervention, and still there are other children with ASD who do not have speech skills until they enter school (Binger et al., 2017).

Research by Tincani (2004) suggests that children with ASD taught using AAC to interact or for academic purposes leads to increased opportunities to practice language that potentially improves social competence and academic performance as well.

The major aim of choosing augmentative and alternative communication for children with autism spectrum disorder who cannot communicate as a subject of the study is to attempt tremendous promise in helping nonverbal individuals with autism overcome their unique communication barriers and their families as well. It is also important to recognize a child who can benefit from AAC and what type of AAC are prefer that match with their skills and knowledge.

The purpose of this review is to investigate interventions that include the use of AAC to support communication skills for children with ASD from birth to the age of eight. Overall, this review is going to

identify appropriate teaching strategies that are most helpful for young children with ASD in both settings (school and home).

Method

To be included in this comprehensive review, published studies met the following criteria: (a) published in a peer-reviewed journal between 2004 and 2017, (b) included children from birth to age eight, (c) included participants identified with an ASD diagnosis, (d) conducted in a school or home setting, (e) investigated the impact of an AAC intervention on communication skills of children with ASD, and (f) conducted in the English language.

The following search procedure was used to locate research articles for this review. First, an electronic search was conducted of all pertinent journals using EBSCOhost and PsychIINFO. Combinations of keywords (teaching AND strategies OR instruction AND communication AND autism AND augmentative OR alternative).

This limited research resulted in over 40 articles. Second, I read each article abstract to determine if there were studies that met the included criteria and a total of 14 studies met the included criteria. The most frequent reason for the exclusion was the setting (i.e., conducted in a clinic) or ages of participants (over 8 years old). For example, the study of Kent-Walsh et al., 2015 investigated the effects of a direct intervention program involving aided modeling and the presentation of constructive targets on the aided production of inverted yes/no questions using AAC. However, all sessions were conducted in a clinical setting which is the reason of excluding it from this paper review.

Coding procedures Each of the 14-single case research design studies were summarized in Table 1 to include study design, participant descriptions (number, age range), settings, intervention implemented, type of AAC, target behavioral outcomes, summary of the results. Categories for AAC type reflect terms commonly used by practitioners: communication boards (pictures of symbols and words that the child may want to communicate, are placed on a board and the child is asked to point at the picture), picture communication exchange system (PECS), dedicated speech generating devices (SGDs) and iPad communication applications. Procedures to teach communication skills in this paper review are (a) prompting "which are procedures [that] include any assistance given to learners with autism spectrum disorders (ASD) that help them use a specific skill" (Adamo et al., 2015) and (b) modeling "which is [when] the display of a desired targeted behavior results in the imitation of the behavior done by learners and that leads to the acquisition of the imitated behavior" (Adamo et al., 2015).

Results

The search produced 14 single-case studies that met the inclusionary criteria. Table 1 shows the participants, setting, intervention, ages, and target behavior, and the type of AAC, and the results. These studies show investigations of the effectiveness of the various teaching strategies on the ability of young children with ASD to communicate through AAC. The following analysis will focus on the application, appropriateness, and usefulness of the teaching strategies used to enhance the AAC use of young children with ASD.

These studies included 134 participants with ASD, participant ages ranged from 18 months to eight years old and the mean age of the participants was 4 years old, and all participants were diagnosed with autism. As previously mentioned, studies were reviewed to determine the setting of the interventions, and the instructional setting of participants. Studies were conducted in two settings. 10 studies took place in school and included 105 participants (Ahlgrim-Delzell et al., 2016; Bellon-Harn et al., 2008; Douglas et al., 2013; Kasari et al., 2014; King et al., 2014; Neeley et al., 2015; Spencer et al., 2008; Stahmer et al., 2004; Tincani, 2004; Travis, & Geiger, 2010), and 4 studies took place in the home and included 29 participants (Braddock et al., 2016; Lerna et al., 2014; Nunes & Hanline, 2007; Reichle et al., 2008).

Reviewed studies were analyzed based upon targeted skill types, either academic or functional. The academic interventions were identified as having the goal of strengthening participants' academic skills and understanding their communication concepts. The functional interventions were identified as having the goal of improving life skills.

The academic interventions were included in four of the reviewed articles, which were (verbal language (n=1) study of Bellon-Harn et al., 2008; early literacy skills (n=1) study of Ahlgrim-Delzell et al., 2016; word vocalization interaction (n=1) study of Tincani, 2004; verbal language (n=1) study of Kasari et al., 2014). While the functional interventions categorized nine of the reviewed articles (social interaction (n=3) study of Nunes et al., 2007; Spencer et al., 2008; Braddock et al., 2016; requesting assistance (n=1) study of Reichle et al., 2008; verbalized synthetically and natural (n=1) study of Travis, & Geiger, 2010; functional communication skills (n=1) study of Stahmer et al., 2004). social validity (n=1) study of Douglas et al., 2013; joint attention (n=1) study of Lerna et al., 2014; natural verbalization (n=1) study of Neeley et al., 2015). In addition, there was one reviewed study that targeted both academic and functional interventions, which were (academic performance and social interaction (n=1) study of King et al., 2014).

Nunes, & Hanline (2007) found that most children with ASD used AAC to initiate, respond, request, and ask questions. However, to gain the highest effects of the interventions on these skills, the targeted AAC intervention focused on building children's strengths and the integration of skills to maximize

communication. In addition, the findings of Bellon-Harn et al. (2008) indicated that AAC interventions may create more opportunities to make children with ASD engaged in social interactions to facilitate the quantity and quality of children's communicative interactions.

Type of AAC

The type of AAC varied across studies including both low and high tech. Low tech AAC included PECS (Lerna et al., 2014; Spencer et al., 2008; Stahmer et al., 2004; Tincani, 2004; Travis, & Geiger, 2010 (n=5) studies, a communication board (Nunes, & Hanline, 2007 (n=1) study, speech generating devices (SGDs) including iPad Applications Ahlgrim-Delzell et al., 2016; Bellon-Harn et al., 2008; Kasari et al., 2014; King et al., 2014 (n=4) studies, Manual sign and Gesture (Braddock et al., 2016 (n=1) study, Picture symbol (Douglas et al., 2013) (n=1) study. Gesture (Neeley et al., 2015 (n=1) study, and Body language, Gesture (Reichle et al., 2008 (n=1) study.

PECS is a modified applied behavioral analysis program that is designed for early nonverbal symbolic communication training (Spencer, Petersen & Gillam, 2008). While PECS is a type of name and part of the communication board, there is a specific process for using PECS that follows six specific phases of teaching (Tincani, 2004). According to Lerna et al. (2014) the six phases contain:

Phase I: Initiating communication physically guided by a prompter to pick up a picture.

Phase II: Teaching distance and persistence through exchanging a picture for the desired object.

Phase III: Discriminating between pictures or symbols.

Phase IV: Beginning to use sentence structure.

Phase V: Answering a direct question.

Phase VI: Beginning to develop commenting rather than just their wants and needs.

As noticed, the greatest numbers of the reviewed studies used PECS. The study of Spencer and colleagues (2008) found that PECS is an effective intervention for children with ASD, and children's characteristics may determine which system is the most optimal. However, the main purpose of these studies that used PECS is to help the participants with ASD to communicate with others and to provide teachers an example of an evidence-based decision-making process that can be applied to the participants (Tincani, 2004).

Five reviewed studies investigated the impact of PECS on the social interaction, verbal initiated response and functional communication skills of young children with ASD (Lerna et al., 2014; Spencer et al., 2008; Stahmer et al., 2004; Tincani, 2004; Travis & Geiger 2010). For example, Stahmer (2004) used a quasi-experimental design to analyze the outcomes of PECS for 20 young children with ASD in an inclusive program for children under the age of 3 years old. Both outcomes on standardized assessments and functional

outcomes were compared at program entry and exit. Moreover, after introducing the PECS system, children began to use spoken language consistently. It contends that the use of AAC did not appear to impair the acquisition of spoken language for these children (Stahmer, 2004).

Tincani (2004) compared the effects of PECS and Sign Language training on the ability of children with ASD to request preferred items, and examined the differential effects of each item on children's acquisition of vocal behavior. In the result, PECS training produced a higher percentage of requests for preferred items more than Sign Language training that produced a higher percentage of vocalizations during training.

Moreover, the study of Tincani (2004) suggested that acquisition of PECS and Sign Language may differ as a function of children with ASD characteristics, specifically, motor imitation skills prior to intervention. In addition, Tincani (2004) suggested mixed findings for teaching to interact using Sign Language and PECS training for learners without hand-motor imitation skills with children with autism. Also, for learners who have moderate hand-motor imitation skills, Sign Language training could be appropriate.

Over these studies, PECS was successful when it was applied to children with ASD of multiple ages in a variety of setting. As knowing PECS training involves six phases, and some studies used one or more. The studies of Lerna et al., 2014; and Stahmer et al., 2004 Travis et al., 2010 addressed more than one phases in advance that used during implementation of the practice.

Lerna, et al. (2014) said that before starting the training, parents were required to record their children's favorite food and toys on a card to make picture cards to be included in the communication book according to a standard procedure. During the training, the children were taught physical exchange (phase I), increasing distance (phase II), picture discrimination (phase III) and sentence structure (phase IV). Study of Stahmer et al., (2004) Child used PECS cards with discrimination to request (phase III), child used two-sign combinations or sentence strip with PECS to request. Then child used one- to three-word phrases only to request or label (phase IV). At the end, the child used phrases of at least three words for the purposes of sharing information or ideas.

The main aim of Travis, et al. 2010 study was to determine the effect of PECS on the frequency of requesting, commenting behavior and the length of verbal utterances for two children with ASD. Based on the purpose of the study, the hypothesis was that there would be an increase of the frequency of requesting due to the introduction of PECS (Phase I), that the length of verbal utterances would increase in Phase IV and that commenting would increase in Phase VI. The maintenance of treatment effectiveness and the specific impact of PECS training are on the structure and the complexity of the verbal utterances.

Ahlgrim-Delzell et al., 2016; Bellon-Harn et al., 2008; Kasari et al., 2014; King et al., 2014; Neeley et al., 2015; (n=5) studies investigated the use of SGDs on the Early literacy skills, and Verbal language. In general, SGD is any electronic communication system that provides speech output of the user's message (Neeley et al., 2015).

Study of Kasari et al. (2014) tested the effect of SGD of improving spontaneous and communicative utterances with children with ASD. Ahlgrim-Delzell et al. 2016; and King et al. 2014 used multiple texts to applied them to iPad touch in speech applications which were designed to help children with ASD to learn communication skills and to enable nonverbal children with ASD to communicate. The results of the two studies were convincing, and the iPads and other SGD can be effectively employed in educational programs for children with ASD (King, et al., 2014). The participants in these studies largely appeared to enjoy using the devices, and in some cases, they seemed to prefer using them over low-tech options (King et al., 2014).

The last type of AAC reviewed in this paper was a communication board which includes symbols or pictures that is used to facilitate communication for children with ASD. The study of Nunes, & Hanline, 2007 used different communication boards with a child with ASD to initiate social interaction, and the result met the child's needs and wants with easily understood instructions by the communication partners.

The interventions used

These studies included two teaching strategies for young children with ASD using AAC including modelling (Spencer et al., 2008; Kasari et al., 2014; Braddock et al., 2016; Neeley et al., 2015; Bellon-Harn, & Harn, 2008; Stahmer et al., 2004; Nunes, & Hanline, 2007; Travis, & Geiger, 2010 (n=8) studies), and prompting (Reichle et al., 2008; Tincani 2004; Douglas et al., 2013; Ahlgrim-Delzell et al., 2016; King et al., 2014; Lerna et al., 2014 (n=6) studies).

Of these studies, eight used "modelling" through PECS to teach communication skills to the children with ASD (e.g. Spencer et al., 2008) through teaching the strategies to the teachers of children with ASD who need AAC to communicate with others. This instruction was provided to the participants by describing the targeted strategy, and the methods, and remembering the steps that were involved in implementing the strategy. Additionally, the instructor modeled the use of the targeted strategy and gave explanations of all steps performed (Spencer et al., 2008). The purpose of this study was to model training to incorporate modeling into existing classroom activities (Spencer et al., 2008).

Of the reviewed studies, a variety of prompting have been successfully used with children with ASD. For instance, one of these studies used verbal prompting by gesturing to teach communication skills to the participants with ASD, and the teacher provided a verbal prompt telling the student to unfasten his pants (Reichle et al., 2008). The instruction that was provided to the participants with ASD was the strategies that

involved these processes (a) using a most-to-least prompting and (b) initially altering the stimulus properties of the task to decrease task difficulty (Reichle et al., 2008). However, one important point to mention is that the teacher should not repeat the prompts if the student is not performing successfully (Reichle et al., 2008).

The study of Ahlgrim-Delzell et al., 2016 used the "pointing picture technique" on the iPad to teach communication skills to the participants with ASD such. The instruction was presented with a letter to be matched with the voiced phoneme that was provided to the participants with ASD, then selecting a written word to match a voiced word such as "Which word am I saying?". Finally, reading a printed word and selecting a picture to match them together "Read the word and find the picture" (Ahlgrim-Delzell et al., 2016).

Evidence of maintenance and generalization

Overall, several improvements in targeted behaviors can be observed in the studies. Nunes, & Hanline, (2007) observed an increase in the child's frequency of initiations and responses using communication boards, generalization across the puzzle and the snack time activities (target routines) during the intervention of the study. Moreover, Spencer et al, (2008) showed a decrease in problem behavior such as hitting and tantrums, and increase in social interaction during the intervention. This progress provides an evidence to support the intervention that would lead to the generalization of the targeted behavior in another setting. Also, the study of Ahlgrim-Delzell et al., (2016) revealed over the generalization of requests for assistance was common without additional intervention.

Discussion

In general, the 14 studies included in this paper review investigated the impact of appropriate teaching strategies that enable children with ASD to achieve their communication skills by using AAC. These studies provided evidences that applied to appropriate models in the use of AAC within naturalistic contexts, a package with various interaction techniques such as modeling and promoting. These positive findings of the impact of AAC lead to improved social interaction, academic performance and decreased challenging behavior, and because of this, the learners made observable gains in speech language (Ganz et al., 2012). It may be that because communication and social interaction are closely related, and improvements in one result is related to improvements of the other (Spencer et al., 2008).

The main goal of communication should extend beyond conveying basic wants and needs (Tincani, 2004). As previously mentioned, many children with ASD have difficulty learning to use spoken communication. However, there are many different types of AAC that can be used either to replace or supplement oral language. AAC provides opportunities for young children with ASD to express their own

thoughts to others. Through these interactions, the children will continue to develop their communication over the course of childhood (Braddock et al., 2016).

In sum, without the understanding of the common advanced communication knowledge and (e.g. initiate, sharing, participating skills) children with ASD will not be able to communicate effectively to succeed in all areas of life. Thus, AAC in general allows a child with ASD to initiate clear intentional communication with peers or teachers or parents, and allows them to initiate a social conversation (Tincani, 2004).

Furthermore, young children with ASD need some support to learn AAC to communicate effectively through targeted behavior interventions such as production of sounds and words, and to learn how to produce words to request needs and wants successfully (Douglas et al., 2013). Lerna et al, (2014) found that young children with ASD learn better when they are not pushed too hard. Also, they have opportunities to interact with their peers, parents and teachers if these members recognize the power of children's early thinking and learning.

Children with ASD make great progress when they receive evidence-based interventions in a natural environment. Children with ASD who learn in very specialized segregated environments have difficulties generalizing the use of new behaviors to other environments, new tasks that were not specifically taught, and to new people. Thus, teaching children in natural everyday settings solves the generalization problem (Nunes & Hanline, 2007).

In general, the important goal of AAC is to help children with ASD to communicate more effectively with others, and to be contributing members of society. AAC supports speech and language development along with supporting functional communication. Additionally, AAC helps children function, learn, and participate in social activities.

Future research should investigate several questions. In particular, additional research is needed to investigate instructional elements of AAC interventions that are most effective. Although the research has reached its aims, there were several limitations. First, because of the time limit, this research was conducted only on a small size of a population between 2004 and 2017. Second, the lack of studies observing participants with ASD at ages under two years old. In other words, the reviewed paper was based on ages from birth until 8 years old. Also, there was a lack of finding resources that aimed to improve the children's communication skills at the age of two years old and less.

TABLE 1

Reviewed Studies

Author	Number of Participate	Ages	Setting	Type of AAC	Target Behavior	Intervener Agent	Result
Ahlgrim-Delzell, et al. (2016).	13	Mean age 6 years old	School	SGD (iPad App)	Early literacy skills	Teachers	Improved the ability to blend sounds to identify words.
Bellon-Harn, et al. (2008)	1	6 years old	Classroom	SGD	Verbal language	Teachers	Results indicate that the child interacted verbally and began to extend the language in the text.
Braddock, et al. (2016).	12	21-43 months.	Home	Manual sign. Picture communication. Gesture.	Increase use of gestures. Increase use of communication board.	Parents and caregivers.	Increased imitative abilities of gestures as well as spoken words. Increased use of sign language and communication board to request.
Douglas, et al. (2013).	1	5 years old	classroom	Picture symbol.	Increase use of picture symbols to social validity.	Trainer	Increased the number of communication acts performed in the study and increased interaction skills.
Kasari, et al. (2014).	61	5-8 years old	School	SGD	AAC use verbal language	Observers	The results of the study suggested that improvements in naturalistic word, communicative utterances, novel words.
King, A. M. 1., et al (2014).	1	6 years old	classroom	SGD (iPad App)	AAC use for academic performance and social interaction.	Teacher	The participant used the iPad apps (academic app and game app) independently to increase academic performance and social interaction.

Author	Number of Participate	Ages	Setting	Type of AAC	Target Behavior	Intervener Agent	Result
Lerna, et al. (2014).	14	18-36 months.	Home	PECS	Use picture symbols to joint attention, verbal and nonverbal requests.	Training examiner.	The results were that PECS training can promote the long-term enhancement joint attention, verbal and nonverbal requests.
Neeley , et al. (2015).	1	4-10 years old	School	SGD Gesture.	Verbal language AAC use to increase number of different words verbalized	Teachers	Increased the natural verbalization of words in obligatory context more than therapy utilizing pictures and gestures.
Nunes, & Hanline, (2007)	1	4 years old	Home	Communication board.	Increase use of communication board to interact.	Observers	Increased the child's frequency of initiatives and responses in using AAC in multiple naturalistic teaching strategies.
Reichle, J., et al (2008).	1	5 years old	Home	Body language. Gesture.	Increase use of gestures to request assistance	Trainer.	The problem behavior decreased, and acceptable alternative increased socially.
Spencer, T. D., et al (2008)	3	3-4-5 years old	School	PECS	Social instruction	Teacher	Decreased some bad behavior because of the increasing of social interaction.
Stahmer, A, et al (2004).	20	2 years old	School	PECS	Functional communication skills.	Teacher	Improved the functional communication and playing increased.
Tincani, M. (2004)	2	5-6 years old	School	PECS	Word vocalization	Trainer	Rate of AAC used and verbal initiated responses increased.
Travis, J., & Geiger, M. (2010)	2	8 years old	School	PECS	Requesting and commenting length of verbal utterance	Observer	The intervention successfully increased the ability in requesting and commenting sentences.

References

1- Ahlgrim-Delzell, L., Browder, D. M. 1., Wood, L., Stanger, C., Preston, A. I. 1., & Kemp-Inman, A. (2016). Systematic instruction of phonics skills using an iPad for students with developmental disabilities who are AAC users. Journal of Special Education, 50(2), 86-97.

2- Bellon-Harn, M., & Harn, W. E. (2008). Scaffolding strategies during repeated storybook reading. Focus on Autism & Other Developmental Disabilities, 23(2), 112-124.

3- Binger, C., Kent-Walsh, J., King, M., Webb, E., & Buenviaje, E. (2017). Early sentence productions of 5-year-old children who use augmentative and alternative communication. Communication Disorders Quarterly, 38(3), 131-142.

4- Braddock, B. A. 1., & Armbrecht, E. S. 1. (2016). Symbolic communication forms in young children with autism spectrum disorder. Communication Disorders Quarterly, 37(2), 67-76.

5- Douglas, S. N. 1., McNaughton, D., & Light, J. (2013). Online training for paraeducators to support the communication of young children. Journal of Early Intervention, 35(3), 223-242.

6- Ganz, J., Earles-Vollrath, T., Heath, A., Parker, R., Rispoli, M., & Duran, J. (2012). A meta-analysis of single case research studies on aided augmentative and alternative communication systems with individuals with autism spectrum disorders. Journal of Autism & Developmental Disorders, 42(1), 60-74.

7- Kasari, C., Kaiser, A., Goods, K., Nietfeld, J., Mathy, P., Landa, R., et al. (2014). Communication interventions for minimally verbal children with autism: A sequential multiple assignment randomized trial. Journal of the American Academy of Child & Adolescent Psychiatry, 53(6), 635-646.

8- Kent-Walsh, J., Binger, C., & Buchanan, C. (2015). Teaching children who use augmentative and alternative communication to ask inverted Yes/No questions using aided modeling. American Journal of Speech-Language Pathology, 24(2), 222-236.

9- King, A. M. 1., Thonrieczek, M., Voreis, G., & Scott, V. (2014). iPad® use in children and young adults with autism spectrum disorder: An observational study. Child Language Teaching & Therapy, 30(2), 159-173.

10- Lerna, A., Esposito, D., Conson, M., & Massagli, A. (2014). Long-term effects of PECS on social-communicative skills of children with autism spectrum disorders: A follow-up study. International Journal of Language & Communication Disorders, 49(4), 478-485.

11- Light, J., & Drager, K. (2007). AAC technologies for young children with complex communication needs: State of the science and future research directions. AAC: Augmentative & Alternative Communication, 23(3), 204-216.

12- Naguib Bedwani, M., Bruck, S., & Costley, D. (2015). Augmentative and alternative communication for children with autism spectrum disorder: An evidence-based evaluation of the language acquisition through motor planning (LAMP) programme. Cogent Education, 2(1), 1-1.

13- NEELEY, R. A. 1., PULLIAM, M. H., CATT, M., & MCDANIEL, D. M. (2015). The impact of interrupted use of a speech generating device on the communication acts of a child with autism spectrum disorder: A case study. Education, 135(3), 371-379.

14- Nunes, D., & Hanline, M. F. (2007). Enhancing the alternative and augmentative communication use of a child with autism through a parent-implemented naturalistic intervention. International Journal of Disability, Development & Education, 54(2), 177-197.

15- Olin, A. R., Reichle, J., Johnson, L., & Monn, E. (2010). Examining dynamic visual scene displays: Implications for arranging and teaching symbol selection. American Journal of Speech-Language Pathology, 19(4), 284-297.

16- Reichle, J., Dropik, P. L., & Alden-Anderson, E. (2008). Teaching a young child with autism to request assistance conditionally: A preliminary study. American Journal of Speech-Language Pathology, 17, 231-240.

17- Senner, J. E. 1., & Baud, M. R. 2. (2017). The use of an eight-step instructional model to train school staff in partner-augmented input. Communication Disorders Quarterly, 38(2), 89-95.

18- Shane, H., Laubscher, E., Schlosser, R., Flynn, S., Sorce, J., & Abramson, J. (2012). Applying technology to visually support language and communication in individuals with autism spectrum disorders. Journal of Autism & Developmental Disorders, 42(6), 1228-1235.

19- Sonnenmeier, R. M. 1., McSheehan, M., & Jorgensen, C. M. 1. (2005). A case study of team supports for a student with autism's communication and engagement within the general education curriculum: Preliminary report of the beyond access model. AAC: Augmentative & Alternative Communication, 21(2), 101-115.

20- Spencer, T. D., Petersen, D. B., & Gillam, S. I. (2008). Picture exchange communication system (PECS) or sign language. Teaching Exceptional Children, 41(2), 40-47.

21- Stahmer, A. C. 1., & Ingersoll, B. (2004). Inclusive programming for toddlers with autism spectrum disorders: Outcomes from the children's toddler school. Journal of Positive Behavior Interventions, 6(2), 67-82.

22- Sundqvist, A., & Rönnberg, J. (2010). Advanced theory of mind in children using augmentative and alternative communication. Communication Disorders Quarterly, 31(2), 86-97.

23- Tincani, M. (2004). Comparing the picture exchange communication system and sign language training for children with autism. Focus on Autism & Other Developmental Disabilities, 19(3), 152-163.

24- Travis, J., & Geiger, M. (2010). The effectiveness of the picture exchange communication system (PECS) for children with autism spectrum disorder (ASD): A south african pilot study. Child Language Teaching.

25- Winsler, A., Abar, B., Feder, M. A., Schunn, C., & Rubio, D. A. (2007). Private speech and executive functioning among high-functioning children with autistic spectrum disorders. Journal of Autism & Developmental Disorders, 37(9), 1617-1635.

26- Adamo, E. K. 1., Wu, J., Wolery, M., Hemmeter, M. L., Ledford, J. R. 1., & Barton, E. E. 1. (2015). Using video modeling, prompting, and behavior-specific praise to increase moderate-to-vigorous physical activity for young children with down syndrome. Journal of Early Intervention, 37(4), 270-285.

27- Ulke-Kurkcuoglu, B. (2015). A comparison of least-to-most prompting and video modeling for teaching pretend play skills to children with autism spectrum disorder. Educational Sciences: Theory & Practice, 15(2), 499-517.

تعليم وتدريس الأطفال من ذوي اضطراب التوحد المهارات لاستخدام الاتصالات البديلة لتطوير مهارات التواصل

الملخص: هدف هذا البحث إلى تحديد ومعرفة أهم وأنجح وسائل الاتصالات البدلية والمعززة، وهي مجموعة من الوسائل الإضافية التي تمكن الأشخاص الذين يجدون صعوبة في التواصل النطقي والكتابي مع الآخرين من التواصل بشكل أفضل وبالتحديد مع الأطفال من ذوي اضطراب التوحد خاصة الغير ناطقين. وذلك من خلال التعرف على أهم خصائص وسمات هؤلاء الأطفال من ذوي اضطراب التوحد، وهي: صعوبات في التواصل واللغة والتواصل الاجتماعي. وقد توصل البحث إلى أن واحدة من أهم الاستراتيجيات المتاحة لهؤلاء الأطفال استخدام وسائل الاتصالات المعززة والبديلة التي تحتوي على وسائل اتصال مدعمة أو غير مدعمة تستخدم للتعبير عن الأفكار والاحتياجات والرغبات. أيضا هذه الوسائل تساعد هؤلاء الأطفال الذين لديهم قصور واحتياجات للتواصل والتعبير مع الآخرين، بما في ذلك الأطفال من ذوي اضطراب التوحد لمساعدتهم في التواصل وبناء العلاقات الاجتماعية مع الآخرين. من خلال هذا البحث تمت مراجعة عدة بحوث من مصادر وبيئات مختلفة بالطرق والأساليب المستخدمة لتحديد أهم استراتيجيات التدريس المناسبة التي تمكن هؤلاء الأطفال الذين يعانون من اضطراب التوحد لتحقيق التواصل من خلال وسائل الاتصالات البديلة والمعززة. وقد توصلت النتائج إلى أن برامج التدخُّل المُبكر تلعب دوراً بالغا في الأهمية في تنمية مهارات التواصل للأطفال ذوي اضطراب التوحد، كذلك تساعد برامج التدخُّل المُبَكِر في تنمية المهارات الاجتماعية لهؤلاء الأطفال. وأخيرا كشفت نتائج البحث أن تحقيق نجاح الأطفال في التواصل قد يساعد أيضا في تقليل الإحباط وزيادة الدافعية لهم ولعائلتهم أيضا والنجاح الأكاديمي والاجتماعي والاستقلالي أيضا.

الكلمات المفتاحية: وسائل الاتصالات البدلية، الأطفال من ذوي اضطراب التوحد، التواصل، وسائل التدخل المبكر، استراتيجيات التدريس.