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Augmentative and Alternative Communication: Benefits and Challenges of utilization in Non-verbal Children with Autism Spectrum Disorder (ASD)

التواصل البديل المعزز: منافع وتحديات الاستخدام مع الأطفال غير اللفظيين المصابين باضطراب طيف التوحد (ASD)

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Abstract:

This article aims to define Augmentative and Alternative Communication (AAC) as a therapeutic intervention and to examine its tools and methods, with a particular focus on their use with children with Autism Spectrum Disorder (ASD), specifically those who are non-verbal or minimally verbal. This population experiences significant difficulties in accessing verbal communication and often does not benefit from traditional intervention approaches based on verbal stimulation and instruction.

Accordingly, AAC is considered as a viable alternative that enables individuals with complex communication needs to communicate differently. AAC offers several benefits across different areas of child's development and daily functioning. However, the process of training non-verbal children with ASD to use AAC remains challenging. This study therefore seeks to identify the challenges encountered by specialists in the implementation of AAC.

Keywords: *Augmentative and alternative communication (AAC); autism spectrum disorder (ASD); non-verbal child*

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ملخص :

يتناول هذا المقال تعريف التواصل البديل المعزز (AAC) بوصفه تدخلا علاجيا ، كما يهدف إلى دراسة أدواته و أساليبه المختلفة، مع التركيز بشكل خاص على إستخدامه مع الأطفال المصابين باضطراب طيف التوحد (ASD) ، ولاسيما غير الناطقين أو ذوي القدرات اللفظية المحدودة . تواجه هذه الفئة من الأطفال صعوبات كبيرة في اكتساب التواصل اللفظي، كما لا تستفيد بشكل كافٍ من المقاربات التقليدية القائمة على التحفيز اللفظي والتلقين الشفهي. وعلى الرغم من تزايد أهمية AAC في السياقات العلاجية، إلا أنّ التحديات العملية التي يواجهها المختصون في تطبيقه لا تزال غير مدروسة بكفاية ،خاصة في ما يتعلق بالأطفال غير الناطقين المصابين بالتوحد.

وبناءً عليه ،يُعد هذا النموذج بديلا فعالاً يتيح للأفراد ذوي الإحتياجات التواصلية المعقدة التعبير عن أنفسهم والتواصل بشكل مُختلف، كما يسهم في تحسين مختلف جوانب نمو الطفل وحياته اليومية ، غير أن تدريب الأطفال غير الناطقين المصابين بإضطراب طيف التوحد على إستخدام AAC يظل عملية معقدة، وتسعى هذه الدراسة إلى التعرف على مجموعة التحديات التي يواجهها المختصون في تطبيق AAC في الممارسة العملية.

الكلمات المفتاحية: *التواصل البديل المعزز؛ اضطراب طيف التوحد؛ الطفل غير الناطق..*

Introduction

Communication is a complex and multifaceted process that is affected by many factors, including factors related to the communication partners, those related to the message, and others related to the channel and the context. Since communication is a key component of the self, it affects the individual's life and social existence. The success of communication requires the presence of at least two partners in order to interact with each other to exchange meaningful messages that involve needs, thoughts and feelings.

The key verbal communication skills are developed during childhood. This explains why the child's ability to successfully acquire and correctly use vocabulary is viewed as the basis for the learning, as well as for cognitive, emotional, and social development, furthermore, it serves as an indicator of a successful social adaptation of life-experiences acquisition.

Dysfunctions in the acquisition of verbal communication skills lead to significant negative consequences, as illustrated by children with Autism Spectrum Disorder (ASD), who often experience marked difficulties in developing functional language. In this regard, Rose et al. (2016) indicate that approximately 25 to 35 % of children with (ASD) are either fail to develop a functional language or have access to only a limited vocabulary, despite the absence of precise, globally agreed-upon statistics.

Since the 1970s, several initiatives have been taken to find alternative communication methods. These initiatives became official by early 1983, the year in which the International Society for Augmentative and Alternative Communication (ISAAC) was founded. This was a significant development towards the spreading of various alternative communication tools in the West. Over the years, these tools have developed and integrated with modern technologies to include all individuals with non-verbal needs, especially those on the autism spectrum disorder (ASD), which falls within the scope of our interest. Therefore, communication-centered interventions (such as speech and language therapy intervention) attempt to improve the ability of this category of children to communicate verbally either by ameliorating speech, or by using alternative tools (sign language, pictures, symbols, etc.) or by integrating these two methods. (Sigafoos et al.,2023)

For more than 40 years, the effectiveness of these methods in sustaining verbal communication and decreasing challenging behaviors has been scientifically proven. For example, the results of a meta-analysis covering 114 studies, which included 330 non-verbal autistic children with limited vocabulary, showed that alternative communication was effective (Ganz et al., 2023).

Despite this globally recognized success, the concept of "alternative communication" continues to be ambiguous and misunderstood, especially within the Algerian clinical community, where research and practices about AAC remain modest and studies focusing on non-verbal individuals with autism are notably absent.

Based on these grounds, this article aims to shed light on Augmentative and Alternative Communication (AAC) by answering the question formulated as follows:

- What does Augmentative and Alternative Communication (AAC)

refer to?

- What are the different types of AAC?
- What AAC tools are used with non-verbal children with Autism Spectrum Disorder (ASD)?
- What are the benefits of AAC for non-verbal children with Autism Spectrum Disorder (ASD)?

- What challenges do AAC specialists encounter when working with non-verbal children with (ASD)?

1. Definition of AAC:

The concept of AAC was introduced in the 1970s in Ontario (Canada), where specialists at Ontario Crippled Children Center used Blissymoblics, a globally-used symbol-based language, that was first developed by Charles K. Bliss during WWII. But, his project remained neglected for long years. Later, it was adapted and translated by the center's specialists in the form of an alternative communication tool, and then used for non-verbal children with cerebral palsy (Mimouni , 2022;Cataix-Nègre, 2015).

The above suggests that Blissymbolics Communication International was the first system to introduce alternative communication. Later, in the aim of sustaining non-verbal individuals to speak, several parts of the world witnessed the development of similar systems, and new symbols were introduced, (Le GRACH and Pictogram Communication System (PCS), in France, and Makaton in the UK).

Over time, more symbol-based systems have been developed and integrated with technologies, and specialists have made more efforts. In 1983, in the aim of spreading awareness and improving the life quality of all the individuals and the children deprived from communication, the International Society for Augmentative and Alternative Communication was founded with 17 member-countries (https://isaac-online.org) .

The American Speech-Language-Hearing Association (ASHA) defines AAC as a set of procedures and strategies that aim to maximize the individual's receptive and expressive language skills for functional and effective communication, by either supplementing or replacing natural speech and/or text with aided or unaided symbols. AAC is used by individuals at all ages, who face speech or language difficulties. While some people may use AAC throughout their entire lives, others may only use it for a short period.

AAC is an umbrella term for all communication methods besides verbal vocal speech, and it is used to augment verbal communication or as an alternative for speech (Berenguer et al., 2022).

Elisabeth Cataix-Nègre, the French occupational therapist, adds that "Alternative communication covers all human and material resources that allow communication in a different or better way compared to conventional or natural

methodes, if the latter are limited or absent. It aims to facilitate the communication process, at both the receptive and expressive levels, by compensating for or replacing a significant speech dysfunction or a verbal impairment that may affect communication." (Cataix-nègre, 2015, p. 16)

With regards to the components of the alternative communication (AAC) system, Beukelman & Mirenda (2013) named four components; namely: symbols, aids, technique, and strategies.

1. Symbols: which may be graphic (pictographic or orthographic), auditory, gestural, and textured or tactile in nature.

2. Aids: refer to the tools being used; these may be electronic or non-electronic (paper), that are used for message transmission or reception.

3. Technique: refers to the way in which messages may be transmitted. The technique refers to the modes of access that the child who uses AAC system applies in message selection. Techniques range from the direct selection of symbol on the aid to the indirect selection through the process of scanning through message choices.

The following are a few examples, provided that there may be other techniques based on tools, and others based on the aid degree that the child requires depending on the complexity of their communication needs.

*Aided selection: the communication partner points to the different symbols on each page or reads them until the child points to the right choice (Howery, 2015).

*Eye-gaze Pointing: the child points out to the selected symbol by means of the eye-gaze (eye-gaze-based selection). The child selects the symbol that they desire to show to their partner, who, in turn, associates a meaning with it. (Aldaqre,2020)

*Coded access: as in the systems based on communication boards, a reference is assigned to each column (number), and to each row (color). The child then looks at the color and the number that correspond with what they want to say.

*Take and show: the child takes the illustrating picture and shows it or places it on the communication board to make whole sentences.

4. Strategies: These are the ways and plans employed by the individual to make the communication clearer, faster and more effective. AAC users may apply various strategies to produce messages more rapidly, navigate the

communication interaction, make understandable messages and improve social appropriateness of communication acts (Beukelman & Mirenda, 2013).

2. Types of aides in Augmentative and Alternative Communication:

Augmentative and Alternative Communication (AAC) systems support individuals with complex communication needs, such as those with Autism Spectrum Disorder (ASD). These systems aim to improve social interaction and verbal expression. They are divided into two main types: aided systems, which use external tools like pictures or devices, and unaided systems, which involve utilizing the user's own body to communicate, such as gestures or sign language.

2.1. Unaided AAC Systems:

Also referred to as "no tech", these systems do not require resources besides the body; these communication systems rely exclusively on the user's body. They include gestures, facial expressions, postures, and sign systems such as Makaton and Co.Gha.Mo, and the signs derived from the official sign language.

2.2. Aided AAC Systems:

This type of systems requires the use of resources along with body; these include: low-tech, mid-tech and high-tech systems.

2.2.1. Low-tech AAC systems:

This type of systems uses illustration symbols; as in the case of communication systems that are based on picture exchange, and that do not require batteries; these include: words written on paper, drawings, pictograms, communication key chains, photographs, communication boards, etc.

2.2.2. Mid-tech AAC systems:

This type generally refers to battery-based electronic devices with simpler functions requiring medium technological assistance, for a limited period of time, due to the need to use or recharge the batteries. These include recording devices, talking-photo albums, etc.

2.2.3. High-tech systems:

The high-tech systems include: Speech Generating Devices (SGDs) with text to speech converting features, Voice Output Communication Assistance Aids (VOCAs), electronic devices equipped with more advanced processors, that include also electronic applications (IOS/Android) installed on tablet devices (iPAD/tablet), computer-based programs (installed on a computer system), etc.

Such devices may contain advanced features that allow for access to tools such as eye tracking.

The specialist may use one or several methods at the same time, based on the communication abilities, adaptive skills, personal preferences, and context. Since communication needs and skills may change over time, AAC targeted to the individual may also changeover time. Many AAC users employ more than one mode; this is referred to as multimodality. (Jullien, 2012)

Furthermore, aided AAC systems are often preferred for children with autism; because they help in achieving more positive results for this population, and also offer practical solution that promote social integration.

Despite the benefits of AAC and the high increase in sustained advanced technological systems. Many studies focused on the issues that parents and AAC users specially ASD children are dealing with in their daily lives (Laubscher et al,2024); this has resulted in pushing certain families that have children and adolescents with complex communication needs to give up on AAC systems or to use them insufficiently. The study carried out by Moorcroft et al. showed that only 39.35% of AAC systems have been used for more than one year; the study was based on a survey administered to Speech-Language pathologists (Posar et al, 2022).

3. Augmentative and alternative tools:

3.1. Unaided tools:

- Authentic body language:

Its main advantages include the facts that it exists in all individuals, and it is natural, spontaneous, emotional, fast and tool-free, whereas its main disadvantages are that it is being limited to beginners, can have different meanings, offers a limited vocabulary, is employed in a limited context, and rarely understood out of that context.

- Sign language:

Its main advantages include the facts that it is spontaneous, fast, tool-free, accessible, permits verbal development, continuous, and is learnt within the family, may be distantly employed, has no developmental restrictions at the receptive level, conceptual since it associates meanings with concrete action and mental image, with the vocabulary improvement being cost-effective. Its main disadvantages include the idea that it is ephemeral, fast, with unstable signs,

intended for individuals who can use and understand sign language, sometimes interpretable, requires training, difficult to use with large audiences. (Cataix-nègre, 2015)

3.2. Aided tools:

3.2.1. Low-tech:

-Environment images and pictograms:

The advantages of images include the facts that they are accessible in different contexts, with easily-understood vocabulary that depicts real-life situations, also fast, adaptable, facilitate modeling, create dialogue topics, easily integrate into the family environment, and create unintended communication. Its disadvantages include that they can distract the child, they are not always accessible, difficult to carry everywhere and in all activities.

-Pictures and symbols in communication boards:

Communication board's pictures and symbols are easy to understand, increase vocabulary and help in language structuring, cost-effective, with no malfunction unlike the technological devices, with the pictograms remaining static, simple and can be drawn by hand. Their disadvantages include the fact that they require to be constantly accessible to the child, that they may be lost or forgotten, complicated and somewhat slow, besides being an unpractical tool because it may take much space besides the negative social image that it may carry, in that the user of this tool may experience a feeling of being different and may be marginalized. (Frinkle,1981)

4. AAC Benefits:

4.1. social interaction and communication:

Users of alternative communication tools show an improvement in interaction and communication pragmatically, by better using the different communication functions, which helps them to understand their environment and be better understood by the others. This sustains social communication and decreases introversion and emersion in subjective feelings.

Family dynamics: refers to the necessity that parents (and even siblings) learn how to use new tools for communication and live a new experience, where the parent becomes a learner that may be correct or wrong. In this way, the parent's

communication quality becomes within the reach of the autistic child, who, in turn, learns how to communicate with others. (Ganz, 2015)

4.2. verbal level:

The alternative communication tools sustain the oral-verbal growth, in general, and comprehension, in particular, by forming associations between the symbols and their meanings (signifier and signified), especially the picture-based alternative communication tools that offer permanent tangible symbols, in contrast with the audible words that are volatile.

In addition, alternative communication tools improve the speech chain perception by making its segmentation, and reconstruction, possible for the child. (Ashbaugh et al.,2017)

4.3. AAC's cognitive benefits:

Matching the symbol (oral, pictorial, symbolic) with its meaning by using alternative communication allows the child to form concepts and mental images, to assign meaning to the environment in which they live, and to motivate them and to constantly sustain these concepts in the manner that leads to continuous cognitive-development. On the other hand, AAC encourages children with ASD to become less egocentric by encouraging them to communicate with others and interact with their environment, which promotes in them more acceptance of learning and discovering. (Tager-Flusberg & Kasari, 2013)

4.4. AAC's psychological and emotional benefits:

AAC tools offer security in the communication process (both at understanding and production levels) in that the stability of exchanges, that is achieved through the use of tangible visual aids, leads to psychological well-being of ASD children.

According to Sarfaty N.: "the simplified, slow, and repetitive multimedia explanation of what happens in the material and temporal environment allows the children with ASD to develop feelings of continuity from which stems the onset of psychological well-being … and it is the beginning of thought."(Garié, 2021, p. 170)

AAC tools contribute to reducing anxiety, maladaptive behaviors, and tantrums because they allow the child with ASD to express their needs and

desires (no matters how), and offers them the freedom of acceptance and rejection.

In addition to the above, the advantages of AAC also include autonomy and individuality. As a result, the child with ASD gains self-reliance in communication.

These advantages interact in a synergistic manner, which allows the child with ASD to generate a beneficial and positive circle of mutual benefits. For instance, when the child is a successful and effective communicator, they develop a sense of security and pride; this encourages them to make more initiatives. As a result, the environment (family, school, therapy room, peers, etc.) positively responds to the child's initiatives, which, in turn, promotes communication and interaction. Despite all these advantages, AAC tools remain limited and face many challenges in their application with the autistic children especially the non-verbal category. (Garié, 2021)

5. AAC implementation challenges for non-verbal children with autism:

During the process of the creation of an AAC system, specialists face several challenges and restrictions including: challenges related to the child's characteristics; those related to the communication system itself; and those related to misconceptions on alternative communication.

5.1. challenges related to accurate motions (in using the signs or in handling the cards and the pictures):

Alternative communication involves the use of signs. However, there are a number of sign-language motions that are complicated and difficult to be executed. Accordingly, it is necessary to adjust the degree of the motor difficulty.

An example of the above is the Coghamo, short for: "*code gestuels pour handicap moteur*", a simplified sign-based communication system, that was invented in late 1980s in Belgium. This system contains 107 simplified motions. It is targeted to individuals with motor disability or who face a difficulty in sign production and unable to communicate. (Jullien,2021)

Coghamo system allows these individuals to express their basic needs with minimal motor accuracy.

Also, in alternative communication using picture exchange and picture pointing, the AAC tool user may face motor difficulties in manipulating the pictures. (Cummings, Carr, & LeBlanc, 2012)

Based on the above, it is possible to avoid such difficulties by using selection boards with distant pictures, enabling the child to put their hand or point to what they want instead of removing and pasting cards on PECS program to form a sentence.

It is necessary to coordinate with a psychomotor therapist and an occupational therapist to overcome these motor challenges.

5.2. Challenges related to the creation of a tangible alternative communication system (time/materials/budget/applicability to all child's life contexts and places)

The creation of a tangible alternative communication system faces a series of challenges because it requires coordination between many specialists in order to select the appropriate visual aid and to select the appropriate media (pictures, drawings, illustration symbols, speech-generating devices). This process requires an accurate assessment of the child's needs and skills (cognitive skills assessment, understanding skills, sensorimotor skills, communication skills, etc.), which constitute a big challenge in light of the shortage of the assessment tools targeted to this sample. (Garié, 2021)

Partnership between parents and the family is of a great significance in the process of creating an alternative-communication system (Laubscher et al,2024). This significance lies in assuring the continuity of the use of this system in daily life, and its adaptation with the child's real communicative needs in various environments (home, school, peers, during activities …), which promotes the effectiveness of the communication system in building the child's autonomy in communication, without neglecting the tool-funding problems, especially the high-tech tools that are expensive (Alsari et al,2021). We must mention the limited resources available in centers, in the Algerian clinical setting, for instance, Simouda (2022) highlighted the shortage of quality and professional tools and resources specifically targeted to children with ASD. Therefore, it is essential to develop more AAC devices in Arabic in order to increase the availability and accessibility of such devices as well as measure its efficacy. (Alsari et al.,2021)

5.3. Challenges related to misconceptions on alternative communication (fears or excessive idealism/over)

Such misleading thoughts stem from the fears of the autistic children' families and, in some cases, from the specialists and/or the therapy team themselves.

Accordingly, one of the proposed solutions to overcome such fears is promotion of the trust relationship between the speech therapist and the child's family by offering them sufficient time to listen to them without giving judgments, by considering their fears, and by not imposing the alternative communication tools on them, because such behaviors may bring about undesired results and may negatively affect the relationship with the child's family and the child's communication development.

Such thoughts may also stem from fear of losing the special and unique communication between the parents and their child who is unable to speak, provided that a natural and spontaneous way of communication has been developed over several years of interaction. In such circumstances, parents may view the introduction of an alternative communication tool as a sort of intrusion into this unique established relationship with their child. They may even view it as a sort of questioning their competence as parents. (Laubscher,et al.2024).

Therefore, first and prior to the introduction of the alternative communication tools, it is necessary to support the parents and to value their success in creating a profound communication relationship with plenty of emotions with their child, and to insure the continuity of such a unique relationship because the parents often understand their child from the first moment, and therefore, it is necessary to reassure them that this type of communication will go on and will not disappear by the introduction of speech or any other way of communication.

Alternative communication tools, using signs, pictures or symbols, may also be rejected when the introduction of such tools is viewed as a sort of giving up the possibility that the child may have access to verbal language, and by extension preventing them from reaching more symbolic levels of communication. (Garié, 2021)

These misconceptions may be refuted by the results of a number of the scientific studies, that have been carried out for 20 years, and all of which confirmed that AAC tools have a positive role in the promotion of

communication, and that these tools do not stop the development of verbal communication (Millar, Light & Schlosser, 2006 ؛Romski & Sevcik, 2005)

In contrast to the above, another category of parents views alternative communication tools with excessive idealism, by considering them as tools that creates communication out of nowhere (almost like a form of magic), but the reality is that communication is built and the use of alternative communication tools requires training. Therefore, the manners in which alternative communication tools work should be explained, and the therapy goals should be realistically determined with the parents. (Romski et al.,2015)

5.4. Challenges related to the severity of ASD:

In some cases, the child is unable to access socially-appropriate communication, however is the quality of the support offered to them; this is because the difficulty lies in the interactive communication functions, and the introduction of included social codes. In the case of communication-related impairment, the changing of codes offers better execution if these latter are visual (Garié, 2021).

It is necessary to highlight the importance of the development of the core-skill that precede intended communication and language, in the aim of promoting communication functions to successfully use of the alternative communication tools.

5.5. Challenges related to the autistic child's cognitive aspect:

To reach the symbolic level the child needs to develop the symbol-referent association this can be difficult for some children, regardless the nature of the signifier. This is especially observable in cases where an intellectual disability is present or when severe sensory sensitivities and difficulties in executive functions that hinder the establishment of an alternative communication system.

Monfort-Juarez argues that, in particular cases, communication disorders may be due to learning difficulties (memory, attention, sequencing) that affect the acquisition of any type of code. (Garié, 2021)

Conclusion

AAC is one of the current most important interventions that aim at reducing the effects of functional communication impairments in children with autism spectrum disorder. It includes all styles and communication tools dedicated to supplement or replace speech. It has two main types: aided alternative communication and unaided alternative communication.

Its main advantages include the development of vocal verbal language, both at the understanding and production levels, the support of cognitive development, in the manner that encourages individuals with autism to be less egocentric, by fostering communication with others and interacting with the environment, which enables them to be more open to learning and discovery. Also, its main psychological and emotional advantages include decreasing anxiety and challenging behaviors and tantrums, by offering children with ASD more freedom to express their needs and desires (no matters how) and more freedom of choice to accept or refuse.

In addition, more advantages of AAC include building autonomy and individuality by enabling children with ASD to becomes self-reliance in communication through the use of the various tools.

Therefore, it has become necessary to cope with the research developments by showing more interest in the theoretical and empirical studies in this area, and applying their findings, in the Algerian clinical setting.

References

-Aldaqre, I. (2020). Looking outside the box: Gaze-pointing for augmentative and alternative communication. In *ACM Symposium on Eye Tracking Research and Applications (ETRA '20 Adjunct)*,(pp1–2). https://doi.org/10.1145/3379157.3391987

-Alsari, N. A. M., Alshair, A. M., Almalik, S. A., & Alsa'ad, S. S. (2021). A survey on the awareness, accessibility and funding for augmentative and alternative communication services and devices in Saudi Arabia. *Disability and rehabilitation: Assistive technology*, *16*(7), 789–795. https://doi.org/10.1080/17483107.2020.1736651

-Ashbaugh, K., Koegel, R. L., & Koegel, L. K. (2017). Increasing social integration for college students with autism spectrum disorder. *Behavioral Development Bulletin, 22*(1), 183–196. https://doi.org/10.1037/bdb0000057

-Berenguer, C., Martínez, E. R., De Stasio, S., & Baixauli, I. (2022). Parents' perceptions and experiences with their children's use of augmentative/alternative communication: A systematic review and qualitative meta synthesis. *International Journal of Environmental Research and Public Health, 19*(13), 8091. https://doi.org/10.3390/ijerph19138091

- Beukelman, D. R., & Mirenda, P. (2013). *Augmentative and alternative communication: Supporting children and adults with complex communication needs* (4th ed.). Baltimore, MD: Paul H. Brookes Publishing Co.

- Cataix-Negre, E. (2015). *Communiquer autrement: Accompagner les personnes avec des troubles de la parole ou du langage: Les communications alternatives*. Belgique : De Boeck Solal.

- Cummings, A. R., Carr, J. E., & LeBlanc, L. A. (2012). Experimental evaluation of the training structure of the Picture Exchange Communication System (PECS). *Research in Autism Spectrum Disorders*, *6*(1), 32-45.

- Finkle, L. J. (1981). Communication boards: Design and construction. *Journal of Special Education Technology, 4*(4), https://doi.org/10.1177/016264348100400404

- Ganz, J. B. (2015). AAC interventions for individuals with autism spectrum disorders: State of the science and future research directions. *Augmentative and Alternative Communication*, *31*(3), 203–214. https://doi.org/10.3109/07434618.2015.1047532

- Ganz, J. B., Pustejovsky, J. E., Reichle, J., Vannest, K. J., Foster, M., Pierson, L. M., Wattanawongwan, S., Bernal, A. J., Chen, M., Haas, A. N., Liao, C. Y., Sallese, M. R., Skov, R., & Smith, S. D. (2023). Participant characteristics predicting communication outcomes in AAC implementation for individuals with ASD and IDD: A systematic review and meta-analysis. *Augmentative and Alternative Communication*, *39*(1), 7–22. https://doi.org/10.1080/07434618.2022.2116355

- Garié, L.-A. (2021). *Pratique orthophonique avec les enfants et adolescents présentant un TSA*. Paris: De Boeck Supérieur.

- Howery, K. L. L. (2015). *Literature review: Conditions for success in augmentative and alternative communication practice*. Alberta Education.

- Jullien, S. (2021). Soutenir la communication des personnes polyhandicapées : les moyens de CAA. *Revue suisse de pédagogie spécialisée, 11*(3), 30–36.

- Laubscher, E., Pope, L., & Light, J. (2024). "You Just Want to Be Able to Communicate With Your Child": Parents' perspectives on communication and AAC use for beginning communicators on the autism spectrum . *American Journal of Speech-Language Pathology* ,*33*(2), 716–735. https://doi.org/10.1044/2023_AJSLP-23-00254

- Millar, D. C., Light, J. C., & Schlosser, R. W. (2006). The impact of augmentative and alternative communication intervention on the speech production of individuals with developmental disabilities: A research review. *Journal of Speech, Language, and Hearing Research*, *49*(2), 248–264. https://doi.org/10.1044/1092-4388(2006/021)

- Mimounie, W. (2022). The effectiveness of an alternative communication program to speech for the benefit of children with cerebral palsy deprived of speech (empirical study). *Afkar wa Affak*, *10*(2), 345–364. https://asjp.cerist.dz/en/article/191222

- Posar, A., & Visconti, P. (2022). Update about “minimally verbal” children with autism spectrum disorder / Atualização sobre crianças “minimamente verbais” com transtorno do espectro do autismo. *Revista Paulista de Pediatria*, *40*, e2020158. https://doi.org/10.1590/1984-0462/2022/40/2020158

- Romski, M., & Sevcik, R. A. (2005). Augmentative communication and early intervention: Myths and realities. *Infants & Young Children*, *18*(3), 174–185. https://doi.org/10.1097/00001163-200507000-00002

- Romski, M., Sevcik, R. A., Barton-Hulsey, A., & Whitmore, A. (2015). Early intervention and AAC : What a difference 30 years makes. *Augmentative and Alternative Communication*, *31*(3), 181–202. https://doi.org/10.3109/07434618.2015.1064163

- Rose, V., Trembath, D., Keen, D., & Paynter, J. (2016). The proportion of minimally verbal children with autism spectrum disorder in a community-based early intervention programme. *Journal of Intellectual Disability Research*, *60*(5), 464–477. https://doi.org/10.1111/jir.12284

- Saimouda, L (2022) . استخدام تكنولوجيا الاتصال الحديثة في دمج أطفال التوحد مع المجتمع: دراسة حالة لمركز رعاية أطفال التوحد "علي رملي" الجزائر العاصمة[Use of modern communication technology to integrate autistic children with society: Case study of the Autism Child Welfare Centre ’Ali Ramli’, Algiers]. *Majallat al-Nass*, *9*(1), 368–382. https://asjp.cerist.dz/en/article/181798

- Sigafoos, J., Carnett, A., Schlosser, R. W., O'Reilly, M. F., & Lancioni, G. E. (2023). Communication assessment and intervention. In J. L. Matson (Ed.), *Handbook of applied behavior analysis for children with autism:*

Clinical guide to assessment and treatment (pp. 173–191). Springer Nature Switzerland AG. https://doi.org/10.1007/978-3-031-27587-6_9

- Tager-Flusberg, H., & Kasari, C. (2013). Minimally verbal school-aged children with autism spectrum disorder: The neglected end of the spectrum. *Autism Research*, *6*(6), 468–478. https://doi.org/10.1002/aur.1329
- *ISAAC*. International Society for Augmentative and Alternative Communication. https://www.issac-online.org
- *ASHA*. American Speech-Language-Hearing Association. https://www.asha.org