

# Evidence-Based Interventions for Aggressive Behaviors in Autism Spectrum Disorders

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## **Abstract**

Generally speaking, evidence-based interventions (EBI) are practices that have been proven to be effective in improving academic and behavior outcomes for all students. Initially, the focus on EBI was more prevalent in areas like medicine and clinical psychology and was extended to the field of education psychology in the '90s. In the United States, schools are required by two federal laws, Individuals with Disabilities Education Act (IDEA) and Every Student Succeeds Act (ESSA), to use academic and behavioral evidence-based practices to address the needs of the entire student population. Since 2008, there has been a significant increase in the research addressing the particular needs of students with autism spectrum disorders (ASD). A growing number of practices has been deemed to hold a solid empirical substantiation, while others are considered only potentially effective (Smith & Iadarola, 2015). In the United States, The National Professional Development Center (NPDC) on Autism Spectrum Disorder has outlined a list of 27 evidence-based practices for students with ASD.

**Key words:** evidence-based interventions (EBI), autism spectrum disorders (ASD), academic and behavioral skills.

## **Résumé**

En générale, les interventions fondées sur les preuves (EBI) sont des pratiques qui se sont révélées efficaces pour améliorer les résultats scolaires et comportementaux de tous les élèves. À l'origine, l'intérêt pour l'EBI était plus répandu dans des domaines tels que la médecine et la psychologie clinique et s'est étendu à la psychologie de l'éducation dans les années 90. Aux États-Unis, deux lois fédérales, l'IDEA (Individuals with Disabilities Education Act) et la ESSA (Every Student Succeeds Act), imposent aux établissements scolaires d'utiliser des pratiques fondées sur des preuves scolaires et comportementales de toute la population étudiante. Depuis 2008, les recherches portant sur les besoins particuliers des étudiants atteints de Troubles du Spectre Autistique (TSA) ont considérablement augmenté. Un nombre croissant de pratiques a été considéré comme ayant une solide justification

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empirique, tandis que d'autres ne sont considérées que comme potentiellement efficaces (Smith & Iadarola, 2015). Aux États-Unis, le Centre National de Développement Professionnel (CNDP) sur les troubles du spectre autistique a dressé une liste de 27 pratiques fondées sur des preuves pour les étudiants atteints de TSA.

**Mots-clés:** les interventions fondées sur les preuves, les troubles du spectre autistique, les résultats scolaires et comportementaux.

### **Rezumat**

La modул general, metodele de intervenție fundamentate științific/ evidence-based interventions (EBI) sunt acele metode sau practici care s-au dovedit eficiente în îmbunătățirea rezultatelor în plan curricular și comportamental ale tuturor elevilor. Inițial, EBI au apărut cu precădere în arii precum medicina sau psihologia clinică, extinzându-se în zona psihologiei educaționale în anii '90. În Statele Unite, școlile sunt obligate prin două legi, Actul Educațional al Persoanelor cu Dizabilități/ Individuals with Disabilities Education Act (IDEA) și Actul Fiecare Elev Reușește, Every Student Succeeds Act (ESSA), să folosească metode de însușire a abilităților curriculare și comportamentale fundamentate științific pentru a întâmpina nevoile tuturor elevilor. Începând cu 2008, s-a înregistrat o creștere semnificativă a cercetărilor în domeniul intervențiilor axate pe nevoile elevilor cu dizabilități din spectrul autist (ASD). Din ce în ce mai multe practici s-au dovedit ca fiind fundamentate științific, în timp ce unele sunt considerate doar ca fiind potențial eficiente (Smith & Iadarola, 2015). Centrul National pentru Dezvoltare Profesională în Dizabilitățile din Spectrul Autist/ The National Professional Development Center (NPDC) on Autism Spectrum Disorder evidențiază un număr de 27 de metode de intervenție fundamentate științific adresate elevilor cu dizabilități din spectrul autist.

**Cuvinte cheie:** metode de intervenție fundamentate științific, dizabilități din spectrul autist, abilități curriculare și comportamentale.

### **Introduction**

Autism spectrum disorder (ASD) is a neurodevelopmental disorder characterized by impairments in communication, socialization, interests, and behaviors and the core deficits of ASD range in severity and often undergo changes once other developmental skills are acquired (Faras, Al Ateeqi, & Tidmarsh, 2010). Research has revealed that aggression rates may be higher in ASD compared to other developmental disabilities. A study by Baghdadli, Pascal, Grisi, & Aussilloux (2003) pointed out that about 50% of children in their study experienced self-injurious behaviors (SIB) and 14.6% of them had severe behaviors (Kvernbekk, 2017).

### **Impact of self-injurious behavior (SIB)**

SIB or self-harming behavior encompasses a wide array of behaviors with different functions, causes, symptoms, and settings. In a study by Montgomery *et*

*al.* (2014, p. 3) challenging behavior is described as: “(a) physical and verbal aggression towards others (e.g., spitting, hitting, and biting) and property destruction; (b) disruptive behavior (e.g., inappropriate verbalizations, temper tantrums); (c) stereotyped (repetitive) and self-stimulatory behavior; and (d) self-injurious behavior (e.g., self-biting, skin picking, head punching, and head hitting)”.

The impact of aggressive behavior raises a substantial concern, being associated with adverse outcomes for children with ASD and their caregivers including, but not limited to:

- physical injury of self and others;
- risk of infections and decreased physical health;
- impact on teachers and classmates;
- reduced availability of educational and social support;
- decreased effectiveness therapeutic, educational, and vocational interventions;
- isolation from family, peers, and teachers;
- decreased quality of life;
- increased stress levels.

### **Interventions for self-injurious behaviors (SIB)**

Considering the increase in the number of cases of autism and the fact that self-injurious behaviors (SIB) are common in children with ASD, more attention has been given to the development and implementation of evidence-based and effective interventions to address this issue.

**Evidence-based practice** is defined as a mix of the best scientific proof, professional knowledge, and identification of individual characteristics (Wong *et al.*, 2015). The decisions regarding the intervention’s of choice for a specific individual should embrace a holistic approach and should be made not only based on the existent scientific evidence and professional expertise but also on the characteristics of the person’s entire framework of support. Thus, choices regarding interventions should reflect the strengths, interests, values, etc. of the person and his/her network of care.

Given the extent of the ASD characteristics and the numerous theories about the causes of SIBs, there is an increased need to address them with empirically validated therapeutic approaches (Mahatmya, Zobel, & Valdovinos, 2008). In this context, behavioral and pharmacological treatments are two of the most researched treatment considerations available for individuals with autism who exhibit SIBs; preventing and treating aggression through effective therapeutic and pharmacologic approaches are important in improving the outcomes of ASD. Research shows that strategies such as: functional behavioral assessment, reinforcement strategies, and functional communication training, along with

pharmacologic treatments, especially second-generation antipsychotics (SGAs), can reduce aggressive behaviors in individuals with ASD (Fitzpatrick, Srivorakiat, Wink, Pedapati, & Erickson, 2016).

Wong *et al.* (2015) conducted a comprehensive review of existent research to classify evidenced-based practices for children and youth on the autism spectrum. The study identified two main approaches to intervention: **comprehensive treatment models (CTMs)** and **focused intervention practices (FIPs)**.

### **Comprehensive Treatment Models (CTMs)**

Comprehensive treatment models are defined as practices aimed at addressing the primary deficits of people with ASD such as: the UCLA Young Autism Program, the TEACCH program, the LEAP approach, or the Denver. Odom, Boyd, Hall, and Hume (2010) came up with a list of 30 CTM programs within the United States.

### **Focused Intervention Practices (FIPs)**

Focused intervention practices are viewed as the building blocks of the interventions geared towards the unique needs of persons with ASD since they target individual skills, goals, or objectives and are achieved in a shorter amount of time. Among them one may list: functional communication training, interrupted behavior chain procedure, discrete trial teaching, pivotal response training, prompting, video modeling, peer-mediated intervention, etc.

According to Kvernbekk (2017), the starting point in addressing SIBs is identifying their functions: attention, escape or avoidance, access to tangible items, and self-stimulation/automatic reinforcement. It should be noted that one behavior may present one or more of the four functions and, sometimes, a behavior can have a certain function, then be maintained by another one. Research shows that there is substantial evidence in the field of applied behavior analysis ABA to validate both consequence- and antecedent-based treatment approaches to address SIB (Boyd, McDonough & Bodfish, 2013). Also, Mahatmya, Zobel, & Valdovinos (2008) consider that the best approach for the treatment of SIB in individuals with autism is behaviorally based and identifying the function of SIB along with selecting treatments based on these functions is crucial for effective treatment.

Extensive empirical evidence supports the idea that interventions based on the principles of applied behavior analysis are efficient in reducing and even extinguishing SIBs. Among these, Kvernbekk (2017) lists: response blocking, offering choices, extinction strategies, and reinforcement-based strategies such as: non-contingent reinforcement (NCR), differential reinforcement of incompatible behaviors (DRI), differential reinforcement of alternative behaviors (DRA), and differential reinforcement of less-occurring behaviors (DRL).

In a research conducted by Wong *et al.* (2015), 27 intervention practices that could be used effectively to teach communication skills in individuals with autism met the What Works Clearing House's criteria for evidence-based practices (EBP). Some of the interventions backed up by the most research regarding their efficacy were: Antecedent based intervention (ABI), Peer-mediated instruction and intervention (PMII), Prompting (PP), Reinforcement (R+), Differential reinforcement of Alternative, Incompatible, or Other Behavior (DRA/I/O), Discrete trial teaching (DTT), Extinction (EXT), Functional behavior assessment (FBA), Functional communication training (FCT), and Response interruption/ redirection (RIR). These interventions will be briefly described in this paper.

### **Antecedent based interventions (ABIs)**

ABIs involve the manipulation of events or circumstances that occur before a problem behavior is exhibited and are geared towards the reduction of the behavior (Fitzpatrick, Srivorakiat, Wink, Pedapati, & Erickson, 2016). Antecedent based intervention target both interfering and on-task behaviors and are usually used after the function of the behavior has been identified through a functional behavior assessment (FBA). Some examples of antecedent procedures often used to decrease repetitive, stereotypical, self-stimulatory, and self-injurious behaviors in learners with ASD are: offering choices, use of time delay strategies, prompting, priming, implementing errorless learning strategies, and using non-contingent reinforcement.

### **Peer-mediated instruction and intervention (PMII)**

In **PMII**, peers without disabilities are systematically taught ways of interacting with learners with ASD in positive and meaningful ways and help them learn new behaviors and increase their communication and social skills within natural environments.

### **Prompting (PP)**

Prompting is defined as providing a verbal, gestural, or physical cue to support a learner with acquiring or/and completing a task or demand and is used to increase the probability of correct responding. This strategy uses a prompting hierarchy which identifies the amount of assistance that each prompt requires so that the child exhibits a correct response. Therefore, depending on the task being taught, the level of current performance, etc. prompting can involve a least-to-most or most-to-least hierarchy. Research has shown that response prompting procedures used to teach response chains are expected to have a great impact on teaching (Libby, Weiss, Bancroft, & Ahearn, 2008).

## **Reinforcement**

Reinforcement is described as the presentation of desirable consequences following a behavior with the intention of increasing the probability that the behavior will occur again. Research shows that stimulus - and reinforcement-based strategies have a significant reducing effect on challenging behavior (Montgomery *et al.*, 2014).

### **Differential reinforcement of Alternative, Incompatible, or Other Behavior (DRA/I/O)**

Differential reinforcement strategies imply that reinforcement is provided for desired behaviors, while inappropriate behaviors are ignored and can be:

- differential reinforcement of other behavior (**DRO**) is provided in the absence of problem behavior, that is when the learner is not engaging in the problem behavior. Within the last 20 years, differential reinforcement of other behavior has been one of the most frequently used treatments for aggression in ASD. (Fitzpatrick, Srivorakiat, Wink, Pedapati, & Erickson, 2016).
- differential reinforcement of incompatible behavior (**DRI**) occurs when the person engages in a behavior that is incompatible with targeted behavior, in other words he/she is engaging in a behavior that is physically impossible to exhibit while doing the inappropriate behavior.
- differential reinforcement of alternative behavior (**DRA**) is provided when the person is engaging in a specific desired behavior other than the inappropriate behavior.

### **Discrete trial teaching (DTT)**

Discrete-trials teaching is a common strategy for conducting early intensive behavioral intervention (EIBI) which has been identified as the treatment of choice for children with ASD (Thomson, Martin, Arnal, Fazzio, & Yu, 2009). Research also indicates that DTT can produce powerful behavioral reduction of aggressive behaviors and despite its limitations, is frequently used for children with autism (Smith, 2001).

DTT is usually used for skills that can be taught in small, repeated steps and a typical DTT sequence follows the pattern: the adult presents a discriminative stimulus, the child responds, and the child receives a consequence/reward based on his/her response.

### **Extinction (EXT)**

Extinction refers to the withdrawal or removal of the positive reinforcement that is shown to have maintaining consequences on an inappropriate behavior. The

major effect of extinction is a decrease in the frequency of the behavior until it reaches a prereinforced level or it stops (Cooper, J.O., Heron, & Heward, 2007).

### **Functional behavior assessment (FBA)**

Carr, Levin, McConnachie, Carlson, Kemp, & Smith, (1994) insist that the focus of an intervention should not be only on eliminating problem behaviors but also on replacing them with socially appropriate new behaviors that have the same function or purpose.

A functional behavior assessment (FBA) is used to formulate a hypothesis of the function/s of SIB and a functional analysis (FA) will identify the correlation between the SIB and the antecedents and consequences of the problem behavior/s. Based upon the findings of the FBA and FA, an individualized intervention plan will be developed which will include the most effective intervention strategies for a specific child. Some researchers consider that, in the absence of an FBA, the wrong treatment may be chosen and the problem behavior may become worse (Fitzpatrick, Srivorakiat, Wink, Pedapati, & Erickson, 2016). Determining the function of SIB should ultimately decide which type of treatment is most beneficial for a certain individual, or if a combination of behavioral or pharmacological approaches should be considered. For example, a drug treatment may not be appropriate when the only function of a specific SIB is social but may be efficient in addressing a problem behavior maintained by escape (Mahatmya, Zobel, & Valdovinos, 2008).

### **Functional communication training (FCT)**

Functional communication training was first introduced as an intervention for problem behavior in children with developmental disabilities and replaces disruptive or inappropriate behavior whose functions are determined through functional behavioral analysis with more appropriate and effective communication. Functional communication training involves reducing inappropriate behaviors by teaching someone to appropriately request access to a desirable consequence (Fitzpatrick, Srivorakiat, Wink, Pedapati, & Erickson, 2016) and is a form of differential reinforcement (DR) procedure that requires that the two responses have similar reinforcing consequences. Also, in FCT, the problem behavior is usually placed on extinction (Tiger, Hanley, & Bruzek, 2008).

### **Response interruption/ redirection (RIR)**

In response interruption/ redirection, an inappropriate behavior is stopped and the individual is redirected through the use of a distracter to do something more appropriate. A specific form of response interruption is the **interrupted behavior chain procedure** in which the child is stopped in the middle of a task

and the adult waits for the child to generate the expected response before allowing him/her to continue the activity (Sigafos & Litlewood, 1999).

To decide when the interruption will occur, some researchers (Bayes, Heath, Williams, & Ganz, 2013) suggest that the interventionists should first do a task analysis of the routine. A study conducted by Hunt, Goetz, Alwell, & Sailor (1986) also supports the effectiveness of the interrupted behavior chain procedure in promoting the generalization of requests from one behavior to another, especially when the trained and untrained sequences present certain similarities.

In conclusion, research has addressed the importance of the development and implementation of comprehensive treatment models (CTMs) and focused intervention practices (FIPs) to address the unique challenges faced by individuals with autism. The existent information on evidence-based practices can be used by researchers, service providers, educators, and families of people with ASD to make informed decisions regarding the most appropriate intervention approaches.

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