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AUTISM SPECTRUM DISORDERS: WHERE WE ARE AND WHERE WE ARE GOING

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ABSTRACT. The diffusion of scientific knowledge about autism can be explained trough the increasing number of researches on this disorder in the last decades, implying in recent updates in its classification, understanding and intervention. The purpose of this paper is to present a literature review on autism highlighting how the recent investigative advances that have shed light on the understanding of the disorder. It reports historically how the first diagnostic criteria were being improved, supplemented and supplanted in the medical classification manuals, based on research until DSM-5. A review of empirical researches that drove these changes is performed to synthesize what has been considered as core aspects of this disorder as a dimensional spectrum. Discusses the increasing number of diagnoses, emphasizing the points that the multidisciplinary research has identified as possible causes, and the knowledge about the development expectations for adulthood. Finally, it reviews the landscape of the main programs and intervention models for people with autism in health and education fields, to point out to the current challenges and those to be addressed in the future.

Keywords: Autism; literature review; diagnosis.

TRANSTORNO DO ESPECTRO AUTISTA: ONDE ESTAMOS E PARA ONDE VAMOS

RESUMO. A ampliação do conhecimento científico sobre o autismo pode ser identificado pelo aumento na produção de pesquisas sobre este transtorno nas últimas décadas, implicando atualizações recentes em sua classificação, compreensão e intervenção. O objetivo deste artigo é apresentar uma revisão da literatura sobre o autismo, apontando como os avanços investigativos recentes têm lançado luz sobre a compreensão do transtorno. Relata historicamente como os critérios para o diagnóstico nos manuais médicos de classificação foram aprimorados, complementados e suplantados com base em evidências até o atual DSM-5. É realizada uma revisão das contribuições teóricas e empíricas que impulsionaram essas mudanças para sintetizar o que tem sido considerado como aspectos centrais desse transtorno como espectro dimensional. Problematiza o aumento do número de diagnósticos a partir dos dados epidemiológicos atuais, destacando o que as pesquisas multidisciplinares têm identificado como fatores etiológicos e prognósticos para a vida adulta. Por fim, revisa brevemente o panorama dos principais programas e modelos de intervenção baseados em evidências para pessoas com autismo nas áreas da saúde e educação, para então apontar os atuais desafios neste contexto.

Palavras-chave: Autismo; revisão de literatura; diagnóstico.

TRASTORNO DE ESPECTRO AUTISTA: DÓNDE ESTAMOS Y HACIA DÓNDE VAMOS

RESUMEN. El propósito de este artículo es presentar una revisión de la literatura sobre el autismo señalando los avances recientes de investigación resultantes que han arrojado luz sobre la comprensión del trastorno. Informa históricamente como los criterios para este diagnóstico en la clasificación de los manuales de medicina se están siendo avanzados, complementados y suplantados con base en la investigación por la corriente del DSM-5. Se realiza una revisión de las investigaciones empíricas que impulsó a estos cambios para sintetizar lo que se ha considerado como aspectos centrales de este trastorno como un espectro dimensional. Se analiza el creciente número de diagnósticos,

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enfatizando o que las investigaciones multidisciplinares han identificado como posibles causas, y lo que se sabe acerca de las expectativas de desarrollo para la edad adulta. Por último, revisa el panorama de los principales programas y modelos de intervención para las personas con autismo en las áreas de salud y educación, para apuntar a los retos actuales en este contexto y aquellos que se abordarán en el futuro.

Palabras-clave: Autismo; revisión de literatura; diagnóstico.

Introduction

In his classic article, Kanner (1943) described eight boys and three girls, including Donald Triplett, then aged five, as follows: "He wandered smiling, making stereotyped movements with his fingers. He spun with great pleasure whatever he could catch to spin in his hands. When taken into a room, he completely disregarded people and went towards an object" (p. 222). In the following year, Hans Asperger (1944) describes the case of a 6-year-old boy named Fritz who: "He learned to speak phrases at an early age and to express himself as an adult. He never managed to join a group of children playing, talking without shyness, even with strangers. Another strange phenomenon was the occurrence of certain stereotyped movements" (p. 86).

These reports show that the characteristics of autism range from mild, and almost imperceptible, to those who do not know the syndrome, to severe conditions accompanied by important difficulties. The separation between the descriptions of children with autism and Asperger syndrome seems not to be the best way to understand this condition. For this reason, among others, autism is now understood from a spectrum, the ASD – Autism Spectrum Disorder. Thus, it is assumed that the differences between the descriptions made by Hans Asperger differ from those explained in the article of Kanner only by intensity and frequency of the same symptoms, being predominantly belonging to the same areas: socio-communicative and behavioral. The aim of this article is to present a review of the literature on autism, pointing out how recent investigative advances have shed light on understanding the disorder.

Development

The diagnostic classification of autism

Historically, autism is first described in medical classification manuals in the late 1980s, under the name Autistic Disorder. Before that, autism was understood in a psychodynamic[2] way, as a form of psychosis that manifested itself in childhood, presented in the literature in clinical case studies, usually assisted by psychoanalysts. Thus, the diagnostic manuals of the 1950s called the autism as a Schizophrenic Reaction, of childhood type, not as a diagnostic category established from descriptive criteria.

It is only in the third edition of the Diagnostic and Statistical Manual of Mental Disorders that we perceive a distancing from the psychoanalytic approach and the emergence of a nosographic entity of autism. The next edition brought the term Pervasive Developmental Disorders (PDDs), in which autism seemed included among other subcategories (American Psychiatric Association [APA], 2002). PDDs were those disorders that were generally diagnosed for the first time in childhood, such as intellectual disability or ADHD, but involved the presence of symptoms in social interaction, communication, and the presence of restricted and stereotyped behaviors and interests. There were five subcategories within the PDD: Autistic Disorder, Aperger Disorder, Rett Disorder, Childhood Disintegrative Disorder and Pervasive Developmental Disorder - Not Otherwise Specified, each with its internal differentiation.

Although he specified the particularities of autism better, this categorical form of understanding generated many impasses among clinicians. There was an indistinction between the subcategories

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[2] The psychodynamic approach understand behavior in terms of the functioning of the mind, with emphasis on the motivation and role of past experience, based on the precepts of psychoanalytic theory.

whose characteristics overlapped, making it difficult to choose the diagnosis exclusively by one of them (Lord & Bishop, 2014). Thereafter, researches began to emerge, showing that the criteria used by the manuals for the distinction between the PDDs and the typical development were valid and reliable, but insufficient to separate subcategories. It was also seen that the typical characteristics of autism were not pervasive, affecting the whole person, but they appeared specifically in the areas of social communication and behavior. It was concluded, then, that the classification in the categorical format was inappropriate, with the approach being preferred as a single spectrum, whose characteristics vary along a continuum. The new form of understanding could better reflect the presentation of these characteristics, on how they appeared in the course of development and the responses of the interventions, which resulted in the adoption of the terminology Autism Spectrum Disorders (ASD).

While the diagnoses of PDDs were based on a triad of characteristics in social interaction, communication and behaviors, ASDs included only two: social communication and behaviors. This is because they understand communication and social interaction as inseparable, previously separated for mere didactic reasons (Lord & Bishop, 2014). Social difficulties are highlighted in that new format in which all three criteria for social communication must now be met, not just half of the items on communication and a quarter of the items on interaction as proposed by the DSM-IV.

DSM-5 began to emphasize more the indication for observing or obtaining reports of the child’s behavior in different contexts, precisely to verify whether or not there is a consistency between them. This because the difficulty of adapting behavior to fit different social contexts was identified as pathognomonic of the condition.

Early signs of autism, which previously had their appearance circumscribed until the age of 3, may now be present throughout the period of childhood. Since some children, whose symptoms are milder may manifest it only when the social demands exceed the end of their resources, as in the cases of the beginning of the schooling of students with Asperger’s Disorder. In fact, historically, this diagnosis has never been clearly differentiated from Autism or Childhood Disintegrative Disorders (CDD). In the case of the former, only the absence of language delay and cognitive difficulties were not enough to distinguish Asperger from autism, and the term high-functioning autism was still used to characterize the presence of these characteristics. In the case of CDD, the differences with autism were explained in the DSM-IV by development regressions, present more intensely in this one than in autism. When new researches showed that regressions appeared as a continuous variable in ASD, especially language development, these alterations ceased to be considered as an exclusive part of autism and were understood as a concomitant condition (Lord & Bishop, 2014). In fact, national studies have shown that language regressions in autism occur in about twenty percent of cases, which de-characterizes TDI as a separate category (Backes, Zanon, & Bosa, 2013).

Finally, Rett Disorder was also withdrawn from ASD in the new DSM-5. This is because a group of American researchers published the discovery that the MECP2 gene is responsible for the cause of the disorder, making it the only category among PDDs with defined etiology (Amir et al., 1999). In addition, their characteristics are similar to autism only in a brief period of childhood development.

Characteristics of autism in DSM-5

The latest version of DSM-5 describes the central characteristics of autism as belonging to two dimensions: social communication and behaviors. The first emphasizes the qualitative aspects of socio-emotional reciprocity, that is, the way in which interaction takes place. In autism, the social approach is presented in an atypical or idiosyncratic way, as in cases where the child takes the initiative to manipulate the hair of strangers by interest in the texture, or approaching excessively his face of the interlocutor to speak. Besides, conversation tends to be deficient in quality and fluency, due, in particular, to the reduction of the sharing of interests, emotions and affections. At this point, circumscribed interests can play an important role by also restricting the possibilities of topics of conversation, minimizing the social repertoire and impoverishing the interactive exchanges.

The heterogeneity of the presentation of the characteristics can be observed from the manifestation of discrete difficulties, such as non-observance of shift changes, to the absence of initiative for social interaction, largely caused by communication difficulties. The integration between verbal and nonverbal communication skills tends to be out of sync or delayed, which contributes to the communicative intention being difficult to understand by the interlocutor. The person with autism can verbally report a story, but without the concomitant use of nonverbal communicative resources such as facial expressions or gestures. The latter are decisive for the interlocutor to interpret what is most relevant in the narrative and the affective meaning of the conversation, since it offers clues about the double meaning of certain words or expressions, for example.

As for changes in visual contact and body language, the first tends to present with reduced frequency, when compared to children without autism, being the look least directed to the face during social interactions. Children without autism focus on the eye during interactions, while those with autism look more towards the mouth region and prefer more geometric images than social scenes (Pierce et al., 2016). These behaviors help explain the loss of social cues that occur during an interaction, which is reflected in social difficulties.

The development and maintenance of relationships tend to be flawed, especially with children on the same level of development, which is more easily observed in the school context (Pierce et al., 2016). There is a propensity for solitary activities, neglecting the participation of peers due to difficulties in sharing plays, in particular those that require more complexity of cognitive and imaginative skills, such as make believe or symbolic representations (APA, 2014).

In more severe cases, an apparent lack of legitimate interest in people can be observed, which can be interpreted as avoidance or distancing behavior due to difficulties in interaction. It is important to highlight that, in the context of school; teacher can bring the child with autism closer to his classmates and help in the involvement of the social interaction, mediating these relationships. In fact, this has been a strong argument in favor of the inclusion of people with autism (Schmidt et al., 2016).

In addition to social changes, restricted and repetitive patterns of behaviors, interests, or activities are also diagnostic criteria for autism. Here, not only stereotyped behaviors and motor mannerisms may be restricted, but also interests. Speech, motor movements or use of objects are presented in a stereotyped or repetitive way, including motor stereotypies, echolalia (repeating words or phrases after being heard), even the classic behavior of aligning toys or spinning objects. These characteristics, when present intensely in children between 3 and 5 years old, indicate a reserved prognosis regarding cognitive development and adaptive skills (Troyb et al., 2016).

Since the first observations made by Kanner (1943), a tendency to sameness in autism was reported. In fact, there is an adherence to routines that can vary across the spectrum, from more rigid and inflexible to more adaptive patterns. The ritualized behaviors are associated, to a large extent, with social anxiety, being used as compensatory strategies to reduce the anxiety derived from exposure to social situations.

Cognitive inflexibility manifests itself in behavior and can be observed through motor rituals, insistence on the same path or food, repetitive questions or extreme anxiety in the face of changes. Ritualized patterns of behavior occur in both verbal and nonverbal ways. In fact, this characteristic has been identified as an important stressor for families and educators because it is difficult to manage (Schlebusch, Samuels, & Dada, 2016).

The interests of the child with autism are prone to be highly restricted and rigid, abnormal in intensity or focus. These children can delve into a circumscribed theme, usually idiosyncratic in nature, such as names of dinosaurs, bus lines, or car brands. On the one hand, this characteristic makes it possible for the autistic person to appropriate a large number of information about specific objects or events, but on the other hand, the social difficulties that accompany the disorder create obstacles to its use for social purposes.

Among the characteristics reported in DSM-5, one of them stands out, and although it has been described historically in several autobiographies and movies on autism, only in the last version of the manual it has come to be considered as a diagnostic criterion. These are the sensory alterations that manifest themselves as hyper-or hyporeactivity to environmental stimuli and that can occur in any modalities of the senses, whether it is tactile, visual, olfactory or auditory (Baranek et al., 2014).

Although some 97% of autistic children exhibit atypical sensory behaviors, they are not unique to autism because they are present in almost 70% of children with other disabilities (Green, Chandler, Charman, Simonoff, & Baird, 2016). An apparent indifference to cold or heat is described. The difficulty for modulating perception in these cases can lead to behavioral difficulties in daily life, such as to deal with climate change in terms of changing clothes from summer to winter or vice versa.

When the auditory sensory modality is altered, it is common for the child to touch their ears, either to buffer the sound sensed as excessively loud, or, on the contrary, to amplify the auditory canal and amplify the sound perceived as low. Touching objects with the tips of the fingers is also often associated with tactile sensory changes, visible when the child with autism explores excessively certain texture, such as styrofoam or rubber surfaces. In the visual modality, there can be a fascination for lights, angles or the rotating movement of objects. The reason for these behaviors is not clear in the literature. Studies that investigate the social contexts of sensory behaviors are divided between those studies that emphasize the role of the environment in reinforcing their maintenance and those that associate their expression with the poverty in interactions (Kirby, Boyd, Williams, Faldowski, & Baranek, 2013). Although there is no consensual explanation for this theme, the frequency of hyporesponsive behaviors in response to social stimuli is more prevalent in children with autism than in other disorders or typical development (Baranek et al., 2013).

The notion of autism as a spectrum implies understanding that its characteristics can manifest in extremely varied ways in each person. A particular child may present serious difficulties in the socio-communicative area, such as the absence of language and resistance to the approach of other children, at the same time that motor stereotypies may not be present, being the behavior more adaptive and flexible to changes. However, another child with the same diagnosis may present a developed verbal language, which facilitates communication, concomitant to the use of facial expressions appropriate to the context, but accompanied by extremely rigid behaviors, with negative reactions to changes in the environment. These examples show that symptomatological heterogeneity can manifest itself in the areas of communication and behaviors independently. For this reason, DSM-5 encourages clinicians to use a table with three levels of severity to score the degree of support needed in each area. This complementary evaluation makes possible the indication that not only the assessed person is within the spectrum of autism, but that aspects in general deserve more attention in the dimensions of communication and behaviors.

There is a clear emphasis in the manual on adding descriptive opinions complementary to the diagnosis in the form of descriptors. Among these, the evaluator should specify cognitive ability (intellectual disability), language skills (presence or absence of speech, lexical repertoire, echolalia, among others), association with medical condition, genetics or known environmental factor (X-fragile or Down syndrome in cases of syndromic autism), or in association with another neurodevelopmental, mental or behavioral disorder (presence of psychiatric comorbidities).

Is there an autism epidemic?

Epidemiological studies have shown how autism occurs in the general population. The distribution of autism by sex shows the prevalence in males, with 1:42 (23.7: 1,000) in males and 1: 189 (5.3: 1,000) females, that is, one girl for every four boys affected. There is a greater severity of the symptoms of autism and mental disability in women, occurring in 36% of these, against 30% in the case of men (Blacher & Kasari, 2016). The prevalence of autism added to the mental disability is of 4.7 cases per 10,000. Among these cases, 46% present average intelligence, 23% are borderline and 31% present intellectual disability (U.S. Department of Health and Human Services, 2014).

The increase in autism cases has been consistently reported over the past few years in the literature. Only a decade ago, the prevalence of one child was estimated for every 110 births, while current epidemiological data indicate one in 68. The main international reference on this subject comes from the *Central for Diseases Control and Prevention* (CDC) of the US Health System. The latest research was conducted in 11 states of that country and organized by *Autism and Developmental*

Disabilities Monitoring (ADDM), using records of the assessment of children up to 8 years of age diagnosed with Autism, Asperger's Disorder or PDD-NOS (U.S. Department of Health and Human Services, 2014). The result confirmed that every one thousand born, 14.7 children present autism, that is, one person with autism in every 68 (Christensen et al., 2016). In the analysis, among the American states that participated in the research, the highest rates were observed in New Jersey (21.9), Utah (18.6) and North Carolina (17.3), while the lowest were in Colorado and Wisconsin (9.5) and Alabama (5.7). Cases have been reported in all ethnic, racial and socioeconomic groups.

Clarifications as to the reason for such a rise in rates have been controversial. There is no unquestionable data to support an increase in the occurrence of autism in the general population (Lord & Bishop, 2014). The most consistent explanations are that some recent changes have led to this increase, such as the greater sensitivity of the diagnostic tools, the increase in the number of reference centers that register the diagnoses, as well as the fact that an increase in knowledge on autism among clinicians, educators and the general population (Presmanes, Hill, Zuckerman, & Fombonne, 2015).

Another explanation for the increase in cases is the supposed association between autism and the triple viral vaccine. A survey published in *The Lancet* suggested that the vaccine against measles, mumps, and rubella (MMR) could trigger the predisposition to autism (Wakefield et al., 1998). The sample included 12 children with gastrointestinal disorders and developmental regressions, including autism. The findings showed that in eight of these cases the vaccine would have contributed to the onset of symptoms because they occurred shortly after vaccination. Such findings have caused controversy, especially in the United Kingdom, because of the resurgence of measles in the population, since parents feared vaccination of their children. A series of international epidemiological studies were conducted in order to confirm or refute this hypothesis. The analysis of all these investigations concludes that current scientific evidences do not support a causal association between the vaccine and autism (DeStefano, 2007). Despite the recognition of important flaws in the original research that associated these events (Wakefield, 1998), which resulted in public retraction by *The Lancet*, coupled with strong opposing evidences, the subject remains controversial. This is because science has not yet been able to identify the etiology of autism, which maintains doubts about the interaction between vulnerability factors for the determination of the disorder.

Etiology of autism

There is a tendency not to consider as definitive the determination of purely environmental or genetic agents on the etiology of autism. A complex combination of genetic and non-genetic risk factors has been the focus of recent investigations (Lai, Lombardo, & Baron-Cohen, 2014). Among the findings, studies have pointed to advanced maternal or paternal age, complications in childbirth and the use of valproic acid during pregnancy. In addition, the occurrence of the disorder is more frequent in association with known genetic or chromosomal conditions, such as X-Fragile syndrome or Tuberous Sclerosis (Christensen et al., 2016). As for genetic factors, siblings are almost 7% more likely to have autism than all other persons are. Gestation seems to play an important role, since between half-siblings on the part of the mother, the rate is 2.4%, and on the part of the father, 1.5% (Lai et al., 2014).

Genetic researches show that autism is not a condition linked to a single gene but a complex disorder resulting from simultaneous genetic variations in multiple genes, associated with genetic, epigenetic interaction and environmental factors (Lai et al., 2014). Therefore, the great behavioral and cognitive variability present in people with autism is possibly due to different causes, pointing to the importance of the study of endophenotypes in autism.

Childhood autism and autism in adulthood

Researches on the prognosis of people with autism do not show favorable results. The risk of mortality is 2.8% higher than in people without autism (Mouridsen, Brønnum-Hansen, Rich, & Isager, 2008). It should be noted that this shortening of longevity is due not to the symptoms of autism, but to the various conditions indirectly linked to it, such as sedentary lifestyle or the continuous use of medications to control behavior, sleep or anxiety problems (Schlebusch et al. 2016).

Longitudinal studies report that as adults there is poverty in independent and educational life, as well as in work relationships and with peers. A recent American study shows that more than half of the young people with autism have left school and are not engaged in paid work, requiring institutional support in the adult life (White et al., 2016). Among the mitigating factors, social opportunities, such as increased participation and circulation in public environments and engagement in groups and communities, can generate cognitive gains and in the adaptive functioning (Orsmond, Shattuck, Cooper, Sterzing, & Anderson, 2013). These data reinforce the need for the diagnosis to be made increasingly early in the beginning of an intervention that minimizes difficulties and promotes independence in adult life.

On the other hand, the fact that attention to the disorder focuses preponderantly on the period of childhood, little interest ends up being provided in the creation of services for adult life. Longitudinal data from the US Department of Education showed that, among students who used special education services, those with autism had less participation and greater social isolation in adult life than other disabilities (Orsmond et al., 2013). These reports highlight the urgent demand for the development of public policies for adults with autism, whether through strategies that facilitate access to the labor market, or by residences that welcome them.

Interventions in autism

There are a myriad of intervention proposals for people with autism, however few are considered Evidence-Based Practices (EBP). Originating in the field of health, EBPs consist of an approach that anticipates a protocol of steps that guide researches to allow a comparison between them, in order to facilitate clear identification of their results. Especially in the United States, United Kingdom and Europe, legislation determines that teaching practices should be based on evidences of effectiveness.

One of the major international centers that proposes to organize evidence-based practice reports on the specificity of autism is the *National Professional Developmental Center on Autism Spectrum Disorder* (NPDC), which is part of the American special education program office, in partnership with three universities: North Carolina (Chapell-Hill), Wisconsin (Madison) and University of California (Davis). The criteria stipulated by NPDC classified 27 interventions in autism as EBP. These interventions are described in the literature based on two broad classes: Comprehensive Models and Focal Practices. The first classes consist of a set of practices that aim to achieve a broad outcome in the learning and development of the central deficits of autism. They include programs such as TEACCH (*Treatment and Education of Autistic and Related Communication Handicapped Children*), LEAP (*Learning Experiences and Alternative Program for Preschoolers and Their Parents*) and Denver (Early Start Denver Model) (NPDC, 2016). In contrast, focal practices are addressed to individual skills or specific goals of a student with autism, such as behavioral techniques of discrete trials or video modeling.

Even though they are didactically separated, comprehensive models embrace focal practices in their practice. An example that has received prominence in the literature is Denver, which integrates a developmental approach centered in the affective relationship to behavioral techniques of teaching. It includes the use of strategies derived from behavior analysis, implemented in naturalistic environments, and selected from the analysis of the sequence of steps of the typical development.

Although supported by evidence, it is known that each method or program cannot be considered more or less effective than another only on the basis of measurable results of researches. EBPs only itemize those practices that show proven results from those that do not. In fact, the intervention that is most appropriate to the child's developmental phase, family choices and cultural context is likely to be the one that will present the best results (Lubas, Mitchell, & De Leo, 2015).

Final considerations

Future Challenges: Where Are We Going?

In the current context of knowledge about autism and the possibilities for intervention, much has already been advanced. The abandonment of the parental etiology hypothesis and the search for an understanding of gene-brain-behavior relationships in the pathogenesis of the disorder are examples of this advance (Klin, Klaiman, & Jones, 2015).

In order to obtain answers about the nature of the disorder, researches seek to have access to the course of symptoms throughout development before making the diagnosis. Recognizing that siblings of autistic children are seven times more likely to develop the disorder, they are monitored in longitudinal studies since babies. The results have shown that the difficulties of social orientation in autism are not innate, as it was thought. On the contrary, there seems to be a derailment of the skills that guide social development evidenced by a drop in fixation of the social gaze between two and six months of life (Klin et al., 2015). Thus, the pathogenesis of autism points to an interdependence between individual experience, brain structure and gene expression in which social development depends not only on vulnerabilities but also on atypical experiences arising from these vulnerabilities. This is because the early decline in attention to social stimuli in autism, such as the preferential gaze in the eyes of parents or caregivers, has been associated with the severity of social symptoms at the time of diagnosis (Klin et al., 2015). These findings reinforce the importance of early intervention as an attenuating potential of the future social difficulties of the person with autism.

On the other hand, the methodology of early identification used by these studies depends on access to state-of-the-art technology that is inaccessible to the general population. The current challenge is to convert the solutions for such identification, found in university laboratories, into viable solutions for public health.

Challenges also permeate clinical and educational interventions. It is observed a consistent production of evidences of effectiveness in the field of health, in opposition to the scarcity in the educational field (Reichow, 2016). However, it is important to note that there are a number of limitations of evidence-based practices, when applied to the study of autism, which make it difficult to generalize in the field of education. For example, of the 400 studies reviewed by NPDC for selection of evidence-based practices, 90% used the single case study methodology, which assists prediction, but not generalization of results.

The great heterogeneity of the symptoms of autism in the communication and social areas, as well as the associated comorbidities, makes the autism profile diffuse, making it difficult to indicate interventions that respond to this variety. In addition, we must consider the complexity to control the different environmental variables that act on the interventions with each subject in its naturalistic context. Thus, the evidence can only indicate, and not prescribe indications of interventions for the educational field. The teacher is the one who should judge which practices could work best in his school with his student, adapting them from his educational experience (Lubas et al., 2015).

The national literature has been abundant in reports about the lack of training of teachers to work with students with autism, highlighting this demand (Schmidt et al., 2016). Thus, the need for continuous teacher training is emphasized, focusing on the identification of autism warning signs and the dissemination of intervention practices, since early childhood education constitutes a natural setting for this purpose.

It is concluded that, despite advances in the understanding of autism and their use for the development of interventions in the clinical and educational fields, the national scene still shows demands that are rarely met such as empirical researches, of an applied nature in the generation of results, which support the development of public policies for serving this population.

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