


Early Diagnosis on ADHD: Is It Possible?

Clay Brites¹ , Heloisa Dias Brites², Roselaine Pontes de Almeida³,
Gabriel Dionisio Gotardo Mata⁴, Luciana Mota Dias Brites³

¹Child Neurologist of Neurosaber Institute, Londrina, Brazil

²School of Medicine, Santa Casa of São Paulo, São Paulo, Brazil

³Neurosaber Institute, Londrina, Brazil

⁴School of Medicine, Londrina State University, Londrina, Brazil

Email: claybrites@gmail.com

How to cite this paper: Brites, C., Brites, H. D., de Almeida, R. P., Mata, G. D. G., & Brites, L. M. D. (2023). Early Diagnosis on ADHD: Is It Possible? *Psychology*, 14, 359-370.
<https://doi.org/10.4236/psych.2023.143021>

Received: August 12, 2022

Accepted: March 12, 2023

Published: March 15, 2023

Copyright © 2023 by author(s) and Scientific Research Publishing Inc.

This work is licensed under the Creative Commons Attribution International License (CC BY 4.0).

<http://creativecommons.org/licenses/by/4.0/>



Open Access

Abstract

ADHD is a condition that leads to significant impairments in the most diverse aspects of life from early years to adulthood. Early identification and diagnosis can allow adequate treatment and reduce its negative impact throughout life, especially on social relationships and academic learning. However, diagnosis up to 5 years of age still poses challenges. This work aims to present the state of the art on the theme and offers the possibility of assisting in this process as well as promoting due discussion and updating.

Keywords

ADHD, Early Diagnosis, Neurodevelopment Disorders, Evaluation, Assessment

1. Introduction

The Attention Deficit and Hyperactivity Disorder (ADHD) affects approximately 5% - 6% of children. It is characterized by an excessive deficit of attention, hyperactivity, and impulsiveness, with significant effects on execution skills, operational memory issues, difficulty in emotional self-regulation, as well as motor and spatial disorganization (Scheres, 2002; Polanczyk et al., 2007). We know, based on several evidence, that ADHD persists throughout life and the losses reap potentialities at each period, leading to recurrent losses and frustrations that diminish future potentials (Harpin et al., 2013). Thus, this disorder impacts on the child's neurodevelopment and behavior, in particular. The impact of such disorder on the neurodevelopment and on the behavior of the child tends to result in emotional and relationship losses with their peers and caregivers, hindering school performance and presenting low self-esteem, which can be extended

throughout adolescence and even adulthood (Banaschewski et al., 2018).

One of the great challenges is the diagnosis of ADHD. As there are still no specific biological markers, the assessment and diagnostic confirmation depend on an interdisciplinary approach and on evaluators who have experience and extensive knowledge of the clinical, cognitive, behavioral, neurofunctional and neuropsychological nuances of the disorder. Furthermore, many characteristics may be absent in some children, especially at an early age, and may only appear in future contexts when demand increases or is not noticed early (Sasaki et al., 2022).

Evidence shows the importance of engaging multiple modes and models of investigation and diverse professionals from both the educational and clinical spectrums for a sound diagnosis (McGonnell et al., 2009). Parental reports, observation of behavior in schools or child care institutions, description based on questionnaires or tests, clinical assessments and use of structured instruments, all together, are valuable for confirmation (Achenbach & Edelbrock, 1991). However, they can still be very subjective depending on the observer and the degree of understanding he has of the available instruments and the DSM-5 criteria. All of this can prolong the diagnosis and leave the child exposed to problems arising very early on, which is a contradiction to the noblest objectives of early identification.

These children can undergo discrimination at an early age since their behavior is more difficult to be handled in social spaces. They are more frequently overlooked by caregivers when compared to their siblings and peers, with fewer chances of being chosen in adoption cases and with frequent sleep issues due to night restlessness. The effects on self-esteem and the risks of developing psycho-pathological feelings and other behaviors are reasons of concern for researchers, raising the attention of psychiatry academics and infant mental health service professionals in relation to its diagnosis (Mulraney et al., 2016).

Due to those effects and considering the fact that it is a neurodevelopmental disorder, it is only natural that parents, caregivers, and physicians are concerned in identifying this disorder as early as possible, especially before the age of 5. At the same time, the typical behavior of children at that age is also common to present a certain level of lack of attention, restlessness, in addition to impulsive attitudes. This overlapping of characteristics, as well as the non-existence of biological markers or specific laboratory or image resources as screening to track the disorder render the diagnostic process a difficult path, since it still relies on a subjective and mostly observational clinical assessment. Additionally, there is evident scarcity of specific neuropsychological and interdisciplinary instruments for diagnostic confirmation.

Pediatricians and health professionals in primary care in general usually start tracking and suspecting of ADHD only at a later age, and most frequently they do not even investigate other mental disorders during childhood. There is evidence that the prevalence of ADHD in pre-school children ranges from 2% to 8% (Egger & Angold, 2006). Longitudinal studies show that failing to identify or

correctly treating ADHD in childhood increases the risk of development deficits and the appearance of neuropsychiatric comorbidities (Barkley, 2015).

In this sense, research being developed in the past decades through retrospective, longitudinal studies and clinical correlations with investigation of epidemiological (genetic and environmental) aspects and works related to perinatal and prenatal factors and their effects on certain cognitive aspects (motor, visual-spatial and executive attention skills) have brought data, robust information and solid evidence that has allowed specialized therapeutic approach and assessment services to seek more objective means of investigating ADHD in pre-school age children.

Early diagnosis and intervention increase the chances of greater success in reducing both the core symptoms of ADHD and its medium- and long-term effects. The parents start having greater awareness over the child in addition to presenting more understanding, non-depreciating attitude. Educators, once aware, engage in applying means to support and encourage the search for resources to assist the child in boosting their strengths and overcoming their weaknesses. The solution is to start early treatment with intervention models that involve both the parents and educators. These intervention models are already empirically well described in literature, and include behavioral and parenting treatment, such as Parent Child Interaction Therapy, Behavior parent training adapted to preschool population (BPT), and Community Parent Education (COPE) (Eyberg & Funderburk, 2011).

This chapter describes the factors associated with the early diagnosis through the several evidence axes gathered to consolidate several associated knowledges that may contribute to a more comprehensive approach to the identification of ADHD on children under 5 years old.

2. The Diagnosis of ADHD: A Brief Review of the Literature

The early diagnosis of ADHD is present in the literature and many studies have shed light on the importance of deepening the investigation mechanisms as well as their impact. ADHD is the most common neurodevelopmental disorder and its prevalence from 3 to 17 years old is 8.9% in the USA, according to data from the National Survey of Children's Health (2019-2020) and from 2 to 5 years old, it is 2.1% (Danielson et al., 2018; Child and Adolescent Health Measurement Initiative, 2022), i.e. double when compared to the prevalence of autism. It occurs twice as often in boys where the symptoms are usually clearer and more visible.

The most recent and updated version of the American Academy of Pediatrics (Wolraich et al., 2019) recommends that the assessment of ADHD should be conducted in children from 4 years of age onwards, in those with core symptoms associated with academic and behavioral problems. The diagnostic process is based on history, risk factors, screening tools, aspects of behavior, interpersonal relationships and the most significant complaints related to more constant exposure to dangers, excessive impulsivity, delays in the evolution of motor, lin-

guistic, social and adaptive neurodevelopment. Special attention should be paid to the presence or absence of genetic disorders, other neurodevelopmental disorders, psychiatric comorbidities, mood swings, sleeping and eating problems, and organic diseases such as thyroid disorders, which may be associated with ADHD symptoms.

Regarding the diagnosis, the literature has emphasized that the DSM-5 criteria are essential. However, the DSM-5 seems not very specific to help the diagnosis in preschoolers for 4 reasons: 1) The demonstration of significant clinical signs is difficult if the child is not at school or in a children's institution; 2) Observers must know very well the typical characteristics of the first years of child development in order to be able to discern abnormal signs; 3) Measures of children's functional profile vary greatly; 4) Few symptom rating scales are validated for use in preschool-aged children to support clinical assessment (Rajaprakashi & Leppert, 2022).

Therefore, research instruments based on reports from parents and teachers have often been used in clinical practice to support and initiate an assessment. Despite being very useful, they lack validity for diagnostic conclusion, as reports can be dubious, inconclusive, limited to indicate intensity and proper quantification. Even so, they can be valuable when included in the clinical evaluation set (Wolraich et al., 1998). In addition, there are today described and validated several instruments to assess behaviors related to ADHD which are considered valid for initial assessment and diagnostic confirmation (Table 1) (Rajaprakashi & Leppert, 2022).

3. Risk and Epidemiological Factors

ADHD has been associated as one of the possible consequences of complications of premature birth and low weight at birth by several studies. The risk of ADHD throughout childhood in premature babies is 2-fold higher when compared to babies born at term. Several behavior issues and cognitive alterations have been described in babies presenting significant perinatal complications, such as prematurity (especially birth before 32 weeks of pregnancy), perinatal anoxia, periventricular hemorrhages, need of neonatal care in intensive care unit, septicemia. These conditions have been associated to unfavorable effects during the acquisition of neurodevelopment skills, and also in the long term, including the initial phase of school learning and throughout the school learning age.

It is important to describe that neurobiological and functional neuroimage studies show that ADHD is a condition related to five main effects in the brain operation, namely: 1) Low levels of dopamine and noradrenalin in subcortical/ventral routes of the anterior cingulate gyrus and frontal lobe; 2) Abnormal and insufficient connectivity among the neuronal routes responsible for the voluntary and involuntary attention; 3) Delay in neuronal maturation in several functional areas; 4) Abnormal operation of amygdala centers of reward; 5) Localized alterations in cerebral volume (cortical and subcortical thickness of certain structures and regions). These alterations can be a result from both genetic

Table 1. Cognitive, neuropsychological and clinical approaches to evaluation ADHD; y = years.

Clinical factors	Instruments
Cognitive functioning	Response time variability
	Inhibition control
	Working memory
	Temporal discounting and decision making
	Timing
Clinical questionnaires (age range)	SWAN Rating Scale (4 - 10 y)
	Vanderbilt Assessment Scales (6 - 12 y)
	Conners Comprehensive Behavior Rating Scales (6 - 18 y)
	Conners Early Childhood Preschool Scale (2 - 6 y)
	Swanson, Nolan, and Pelham, version IV scale (SNAP-IV) (6 - 18 y)
	Child Behavior Checklist (6 - 18 y)
Neuropsychological approaches	ADHD Rating Scale-5 for Children and Adolescents (5 - 17 y)
	Go/No-Go task
	Stop Signal Reaction Time
	Working memory task
	CANTAB battery
	Game of Dice task
	Iowa Gambling Task
Reaction time task	

factors and unfavorable environmental events, including those described in the previous paragraph.

The processes related to ADHD genetics have demonstrated that its inheritance index can be greater than 70%. Even without any environmental issues or complications, parents with ADHD increase the risk of their children having ADHD in more than 60%. These rates are as high as those for disorders such as schizophrenia, autism, and bipolar disorder, and even higher than those for unipolar depression and anxiety. There are several genes involved in its transmissibility and many studies have advanced in the attempt to describe candidate genes, epigenetic profiles (carriers of a specific candidate gene with any kind of risk behavior, such as tobacco consumption by the mother during pregnancy), association with copy number variations (CNV) and genic overlapping with other neurodevelopmental and psychiatric disorders (Langley, 2018). These studies corroborate clinical impressions of decades that the presence of ADHD or other associate conditions in the parents are considered risk factors (Table 1).

Many epidemiological studies have demonstrated greater incidence of ADHD in populations from lower social and economic strata and with greater privation of financial resources. Some of the most common behaviors and habits in those

populations also contribute for their development with less access to preventive information, consumption of alcohol and tobacco during pregnancy, use of illegal drugs, greater exposure to perinatal complications and psychiatric issues (Luby, 2017).

More recently, new data and crossed information have associated a higher prevalence of ADHD in children living in environments with greater emotional instability and maternal stress. Children presenting externalizing behaviors and emotional self-regulating issues (common in ADHD) have been most frequently observed when under the care of mothers with high levels of stress, warmth profile, and low capacity of disciplining in a resilient manner (Muñoz-Silva et al., 2017). In this sense, it can be inferred that adopted children have lived with biological parents presenting those issues, or have felt high levels of affective neediness in significant moments and circumstances in their lives, but it is also known that those children have also been exposed to unstable pregnancies, with hardly any prenatal care, with parents that have likely been using toxic substances, that if the child does not present any signs of neuro-psychiatric disturbances on their own.

4. Guidelines, Scientific Consensus, and Multi-Centric Studies

Studies and scientific evidence on ADHD reporting on its clinical and behavioral expressions at several ages throughout the life cycle since the 1980s are well described by several specialized research groups and have been gathered in consensus and guidelines, consolidated in documents and specialized journals regarding the protocols adopted in several countries, including regarding the early signs of the disorder.

The main references available include Eunethydis (European Network for Hyperkinect Disorder); WFADHD (World Federation on ADHD); national health protocols for countries such as the USA, Canada, United Kingdom, Australia; regional or continental guidelines, and specific early diagnosis and intervention programs such as PEDIA (Programme for Early Detection and Intervention for ADHD). Signs and symptoms, and diagnostic conclusion means recommended by those organizations are available online; these publications undergo constant updates and can be read and accessed free of charge.

ADHD in children aged under 5 is characterized by issues that tend to lead to neurodevelopment deviations or delays, especially in motor and language skills. These children present incessant crying, high irritability, significant and intense difficulty in dealing with waiting and everyday frustrations, excessive restlessness that bothers and restricts leisure and structured activities in groups, and at this age (under 5), hyperactivity is more present than attention deficit. There are few stable and reliable instruments to assist in this approach, but some of them are already available (Table 2).

The possibility of certainty increases if externalizing or internalizing comorbidities are presented together with a family history of ADHD or other psychopathological conditions, risk environment, and/or family socio-economic status

Table 2. Genetics and environmental risk factors to ADHD.

Etiopathogenics factors	Types and evidences
Molecular genetic studies	Twin studies
	High heritability (70%)
	Psychiatric Genetics Consortium(PGC)
	First-degress relatives with ADHD
Candidate-gene studies	Parental psychopathology
	DAT1, DRD4, 5-HTT, COMT, MAOA,SLC6A2/NET, DRD2, XKR4, NPSR1, CNR1, DCDC2, GRIN2B
Environmental risks	Expose to alcohol
	Maternal smoking during pregnancy
	Prematurity
	Low weight birth
	Stressful life events
	Emotional deprivation
	Childhood maltreatment subtypes
Overlap with genetic conditions	Genetic syndromes
	Bipolar disorders
	Autism Spectrum Disorders
	Intellectual Disorders
	Languagem Disorders

(poverty, family disruption, traumatic experiences, abuses, negligence). At that age, some comorbidities are usually more present and can be observed even before ADHD and thus can be used as a prelude: Oppositional Defiant Disorder (ODD), Obsessive-Compulsive Disorder (OCD), and sleep disorders. These children tend to play in a noisy, impulsive, fragmented manner, breaking their toys without patient to explore them as they should; they wear out their peers because they are very insistent, invasive, and too accelerated. They are much more prone to accidents, traumas, hospitalizations, and demand much more care because of recurring dangerous situations in which they put themselves into. Knowledge of the signs described above, associated with the application aligned with the DSM-5 criteria is the base to guide the investigation (**Table 3**).

Some medical conditions can be confused with ADHD, such as hearing loss, sleeping issues, anemia, enterobiosis, lead poisoning, thyroid disorders, and the effect of medications. The presence of syndromes or genetic conditions such as fetal alcoholic syndrome, fragile X, phacomatoses, Willians-Beurer, history of epilepsies, Sydenham chorea, and PANDAS may either cause hyperactivity or be ADHD comorbidities and thus, must be considered in the assessment.

Therefore, the recognition and diagnostic process of ADHD depend on 1) Interview with parents and/or caregivers; 2) Collection of complementary

Table 3. ADHD DSM-5 criteria.

<p>Inattentive criteria: Six or more symptoms of inattention for children up to age 16 years, or five or more for adolescents ages 17 years and older and adults; symptoms of inattention have been present for at least 6 months, and they are inappropriate for developmental level:</p>	<ul style="list-style-type: none"> ○ Often fails to give close attention to details or makes careless mistakes in schoolwork, at work, or with other activities. ○ Often has trouble holding attention on tasks or play activities. ○ Often does not seem to listen when spoken to directly. ○ Often does not follow through on instructions and fails to finish schoolwork, chores, or duties in the workplace (e.g., loses focus, side-tracked). ○ Often has trouble organizing tasks and activities. ○ Often avoids, dislikes, or is reluctant to do tasks that require mental effort over a long period of time (such as schoolwork or homework). ○ Often loses things necessary for tasks and activities (e.g. school materials, pencils, books, tools, wallets, keys, paperwork, eyeglasses, mobile telephones). ○ Is often easily distracted. ○ Is often forgetful in daily activities.
<p>Hyperactivity-Impulsivity criteria: Six or more symptoms of hyperactivity-impulsivity for children up to age 16 years, or five or more for adolescents ages 17 years and older and adults; symptoms of hyperactivity-impulsivity have been present for at least 6 months to an extent that is disruptive and inappropriate for the person's developmental level.</p>	<ul style="list-style-type: none"> ○ Often fidgets with or taps hands or feet, or squirms in seat. ○ Often leaves seat in situations when remaining seated is expected. ○ Often runs about or climbs in situations where it is not appropriate (adolescents or adults may be limited to feeling restless). ○ Often unable to play or take part in leisure activities quietly. ○ Is often “on the go” acting as if “driven by a motor”. ○ Often talks excessively. ○ Often blurts out an answer before a question has been completed. ○ Often has trouble waiting their turn. ○ Often interrupts or intrudes on others (e.g., butts into conversations or games).
<p>Following conditions must be met</p>	<ul style="list-style-type: none"> • Several inattentive or hyperactive-impulsive symptoms were present before age 12 years. • Several symptoms are present in two or more settings, (such as at home, school or work; with friends or relatives; in other activities). • There is clear evidence that the symptoms interfere with, or reduce the quality of, social, school, or work functioning. • The symptoms are not better explained by another mental disorder (such as a mood disorder, anxiety disorder, dissociative disorder, or a personality disorder). The symptoms do not happen only during the course of schizophrenia or another psychotic disorder.
<p>Three presentations of ADHD can occur</p>	<ul style="list-style-type: none"> • Combined Presentation: if enough symptoms of both criteria inattention and hyperactivity-impulsivity were present for the past 6 months. • Predominantly Inattentive Presentation: if enough symptoms of inattention, but not hyperactivity-impulsivity, were present for the past six months. • Predominantly Hyperactive-Impulsive Presentation: if enough symptoms of hyperactivity-impulsivity, but not inattention, were present for the past six months.

information with teachers and/or professionals from childcare or teaching networks; 3) Use of questionnaires and assessment scales; 4) Direct observation; and 5) Neuropsychological and interdisciplinary assessment. The integrated clinical consideration of that set of integration, associated with the strengths and weaknesses in the behavior, aligned with the losses these actions bring to the child and their caregivers in the different environments that surround them is the key to the diagnostic verdict.

5. Cognitive and Neuropsychologic Aspects

ADHD is a condition based on neurobiological constructs. Several studies have demonstrated that it is associated with findings of neuropsychological, cognitive, neuroimage (both structural and functional), and neurophysiological (EEG, for instance) abnormalities. Therefore, it is to be expected that problems in cognitive operation are found together with ADHD symptoms, and their identification can be valuable.

Assessing how the child works and reacts when faced with tasks presented under structured tests can reveal response profiles that offer valuable information for diagnosis. Neuropsychological tests can be applied according to the age and validity of the instrument, and their analysis must respect both qualitative and quantitative criteria (Table 2). Until a few years ago, there were no reliable instruments for children under the age of 5, but most recently we have seen the structuring of valid tests (Dias & Seabra, 2018). In addition to the results of those tests, the observation of how the child behaves before, during and after their application is very important (Conners, 2001).

In this sense, many tracking and screening questionnaires have appeared after populational research and broad clinical observation from child psychiatric and neurological institutions (Brites, 2015). Scales such as SNAP-IV, SWAN and others have been tested and compared against the DSM-5 criteria and other reliable and valid assessment instruments that respect the normal distribution and, thus, are considered stable and can be applied as important parameters in the diagnostic process.

The greatest cognitive difficulties observed in children with ADHD are issues in remembering auditive and visual processes, little inhibitory self-control, slowness, or disorganization to process tasks, aversion to waiting, difficulty in fulfilling tasks without immediate rewards or which demand a slightly higher mental effort to notice details, errors, or imperfections. Those deficits take an even greater importance when faced with observations of performance in pre-school environments and in the behaviors observed during activities under instructions, rules, and daily routines, when compared with their peers in the same age group.

6. So, Is It Possible to Have an Early Diagnosis?

The diagnosis for ADHD is essentially interdisciplinary, multi-environmental, and depends on current and retrospective clinical observation, behavioral analysis, and verification of the most significant losses in several environments and in the interaction with several people, the patient's peers in the same age group, and with their caregivers. In this sense, it is important to gather as much prenatal, perinatal, developmental, physical, neurological health and behavioral information of the child as possible, in addition to checking their family history.

Added to such conduct, we must use questionnaires and guided and structured interviews to highlight the most important and significant data, and request

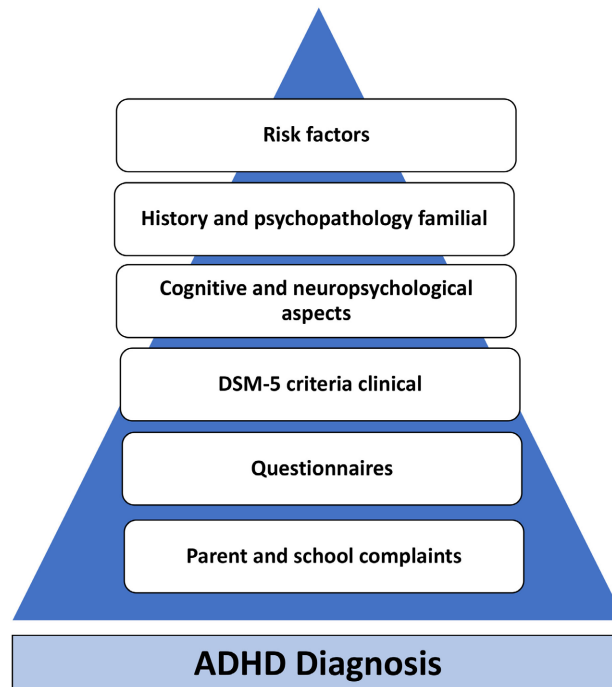


Figure 1. ADHD diagnosis: interdisciplinary and multifaceted approaches.

neuropsychological assessment with the description of qualitative and quantitative aspects of the child's cognitive operation. All the information, when compared and cross-examined, aligned with the ADHD diagnostic criteria in DSM-5, if positive for the disorder, must be sufficient to complete the diagnosis (**Figure 1**).

Therefore, it is possible to obtain an early diagnosis. But the available data and research still demonstrate the need for more future studies on the genetics and clinical patterns of ADHD so that there is greater specificity in diagnostic procedures. Studies that can group larger populations and samples both to allow for more typical clinical descriptions and screenings of ADHD and to follow up, in the long term, children with risky behavioral conditions and verify possible outcomes.

Nevertheless, in case a final diagnosis cannot be reached, the recommendation is to start early intervention with cognitive-behavioral psychotherapy and parental training to reduce self-regulation problems and inhibitory control in order to reduce or mitigate the future ADHD risks that may eventually appear.

The present study aimed to show the importance of early diagnosis and its implications both in the prevention of secondary complications of ADHD and to sensitize professionals of health and education to observe and identify children at risk, understanding that this practice depends on constant updating and training.

7. Conclusion

- There are several clinical-behavioral indications and signs that ADHD can be diagnosed before the age of 5;

- Risk factors for ADHD, the alterations generated by hyperactivity, especially in the circadian cycle of the small child and in their social behavior call the attention and shed light on the possibility of the ADHD appearing well before the most common ages when it is likely to appear;
- The advancement of the neuroscientific research and the development of neuropsychology with the most recent correlations between cognition and behavior has brought more solid explanations for ADHD;
- Early diagnosis of ADHD is possible, but it depends on a broad inter-disciplinary assessment. Its investigation must consider several observers and several environments, and their corresponding impacts on the child, their peers, and caregivers.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

References

- Achenbach, T. M., & Edelbrock, C. S. (1991). *Manual for the Child Behavior Checklist and Revised Child Behavior Profile*. University Associates in Psychiatry.
- Banaschewski, T., Coghill, D., & Zuddas, A. (2018). *Oxford Textbook of ADHD*. Oxford University Press.
- Barkley, R. A. (2015). *Attention-Deficit Hyperactivity Disorder: A Handbook for Diagnosis and Treatment* (4th Edition). The Guilford Press.
- Brites, C., Salgado-Azoni, C. A., Ferreira, T. L., Lima, R. F., & Ciasca, S. M. (2015). Development and Applications of the SWAN Rating Scale for Assessment of Attention Deficit Hyperactivity Disorder: A Literature Review. *Brazilian Journal of Medical and Biological Research*, 48, 965-972. <https://doi.org/10.1590/1414-431x20154528>
- Child and Adolescent Health Measurement Initiative (2022). *Prevalence of ADHD 2019-2020 Data Resource Center for Child and Adolescent Health supported by the U.S. Department of Health and Human Services, Health Resources and Services Administration (HRSA), Maternal and Child Health Bureau (MCHB)*.
- Conners, C. K. (2001). *Conners' Rating Scales-Revised: Instruments for Use with Children and Adolescents*. Multi-Health Systems.
- Danielson, M. L., Bitsko, R. H., Ghandour, R. M., Holbrook, J. R., Kogan, M. D., & Blumberg, S. J. (2018). Prevalence of Parent-Reported ADHD Diagnosis and Associated Treatment among U.S. Children and Adolescents, 2016. *Journal of Clinical Child & Adolescent Psychology*, 47, 199-212. <https://doi.org/10.1080/15374416.2017.1417860>
- Dias, N. M., & Seabra, A. G. (2018). *Neuropsicologia Com Pré-Escolares: Avaliação e Intervenção*. Pearson.
- Egger, H. L., & Angold, A. (2006). Common Emotional and Behavioral Disorders in Preschool Children: Presentation, Nosology, and Epidemiology. *Journal of Child Psychology and Psychiatry*, 47, 313-337. <https://doi.org/10.1111/j.1469-7610.2006.01618.x>
- Eyberg, S. M., & Funderburk, B. (2011). *Parent-Child Interaction Therapy Protocol*. PCIT International.
- Harpin, V., Mazzone, L., Raynaud, J. P., Kahle, J., & Hodgkins, P. (2013). Long-Term Outcomes of ADHD: A Systematic Review of Self-Esteem and Social Function. *Journal of Attention Disorders*, 20, 295-305. <https://doi.org/10.1177/1087054713486516>

- Langley, K. (2018). ADHD Genetics. In T. Banaschewski, D. Coghill, & A. Zuddas (Eds.), *Oxford Textbook of Attention Deficit Hyperactivity Disorder* (pp. 19-24). Oxford University Press. <https://doi.org/10.1093/med/9780198739258.003.0003>
- Luby, J. (2017). *Handbook of Preschool Mental Health: Development, Disorders, and Treatment* (2nd ed.). The Guilford Press.
- McGonnell, M., Corkum, P., McKinnon, M., MacPherson, M., Williams, T., Davidson, T. et al. (2009). Doing It Right: An Interdisciplinary Model for the Diagnosis of ADHD. *Journal of the Canadian Academy of Child and Adolescent Psychiatry, 18*, 283-286.
- Mulraney, M., Zendarski, N., Mensah, F., Hiscock, H., & Sciberras, E. (2016). Do Early Internalizing and Externalizing Problems Predict Later Irritability in Adolescents with ADHD? *Australian & New Zealand Journal of Psychiatry, 51*, 393-402. <https://doi.org/10.1177/0004867416659365>
- Muñoz-Silva, A., Lago-Urbano, R., Sanchez-Garcia, M., & Carmona-Márquez, J. (2017). Child/Adolescent's ADHD and Parenting Stress: The Mediating Role of Family Impact and Conduct Problems. *Frontiers in Psychology, 8*, Article No. 2252. <https://doi.org/10.3389/fpsyg.2017.02252>
- Polanczyk, G., de Lima, M. S., Horta, B. L., Biederman, J., & Rohde, L. A. (2007). The Worldwide Prevalence of ADHD: A Systematic Review and Metaregression Analysis. *American Journal of Psychiatry, 164*, 942-948. <https://doi.org/10.1176/ajp.2007.164.6.942>
- Rajaprakashi, M., & Leppert, M. L. (2022). Attention Disorder/Hyperactivity Disorder. *Pediatrics in Review, 43*, 135-147. <https://doi.org/10.1542/pir.2020-000612>
- Sasaki, H., Jono, T., Fukuhara, R., Honda, K., Ishikawa, T., Boku, S., & Takebayashi, M. (2022). Late-Manifestation of Attention-Deficit/Hyperactivity Disorder in Older Adults: An Observational Study. *BMC Psychiatry, 22*, Article No. 354. <https://doi.org/10.1186/s12888-022-03978-0>
- Scheres, A. P. J. (2002). Inhibitory Control and Cognitive Energetic Factors in ADHD. Ph.D. Thesis, Vrije Universiteit.
- Wolraich, M. L., Feurer, I. D., Hannah, J. N., Baumgaertel, A., & Pinnock, T. Y. (1998). Obtaining Systematic Teacher Reports of Disruptive Behavior Disorders Utilizing DSM-IV. *Journal of Abnormal Child Psychology, 26*, 141-152. <https://doi.org/10.1023/A:1022673906401>
- Wolraich, M. L., Hagan, J. F., Allan, C. et al. (2019). Clinical Practice Guideline for the Diagnosis, Evaluation, and Treatment of Attention-Deficit/Hyperactivity Disorder in Children and Adolescents. *Pediatrics, 144*, e20192528. <https://doi.org/10.1542/peds.2019-2528>