Review article

Brazilian consensus of specialists on the diagnosis of attention-deficit/hyperactivity disorder (ADHD) in adults

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Some authors are part of the consulting board, are lecturers or received research funds from the following laboratories: Biosintética, Bristol-Meyers-Squibb, Glaxo, Janssen-Cilag, Lilly, Lundbeck, Novartis, Pfizer, and Wyeth.

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Received June 6, 2005. Accepted February 17, 2006.

INTRODUCTION

The adult form of the attention-deficit/hyperactivity disorder (ADHD) was officially recognized by the American Psychiatric Association in 1980, when the Diagnostic and Statistical Manual - 3rd edition[1] (DSM-III) was published. Such diagnosis is still present in the current version (DSM-IV).[2] The International Classification of Diseases (ICD-10),[3] officially used in Brazil, does not list the adult form in its criteria. The diagnosis of ADHD in adults is still now a reason for some debates.

The term “hyperkinetic reaction of childhood” (as it appeared in the DSM-II, in 1968) implied that the disorder concerned childhood psychiatrists, and the inclusion of the ADHD diagnosis in all subsequent reviews (DSM-III, in 1980; DSM-IIIR, in 1987; and DSM-IV, in 1994), in the chapter “Childhood disorders” contributed to reinforce the concept of being a disease restricted to childhood. Nevertheless, the DSM-IV text acknowledges, even if in a little incisive manner, that in some cases the disorder may persist until adult life. The hybrid term “hyperactivity”, which is a metamorphosis of the Greek term “hyperkinesis” and corresponds to the Latin term “superactivity” (the correct one), has been widely used among doctors and laymen since the 1970's. At that time, it was believed that the improvement of hyperactivity and impulsivity at the end of adolescence would correspond to the remission of the disease.[4] The publication of the DSM-III in 1980 introduced great changes: a) the inclusion of the etiology for the definition and terminology was abandoned in favor of phenomenological operational criteria; b) the possibility of ADD with no hyperactivity, with the focus on inattention as the main symptom; and c) the possibility of an adult form called "residual type." One year later, Wender et al.,[5] part of the Utah Group, published the first criteria for the diagnosis in adults. Around 10 years later, a study was published reinforcing the neurobiological base for ADHD in adults,[6] using PET scan (positron-emission tomography) in adults with the disorder.

Until the publication of the DSM-III review in 1987, there was no significant number of publications that would support the idea of ADD without a significant presence of hyperactivity.

However, from 1987 to 1994, when the DSM-IV[2] was published, several studies documenting its presence were published. From 1994 on, several publications have shown that a reasonable number of children and adolescents with ADHD maintained symptoms of the disorder in adult life, opposed to what was believed in the 1970's.

METHODS

The authors received a non-systematic preliminary review of the literature concerning the diagnosis of ADHD in adults prepared by a coordinator (P.M.). He maintained an electronic communication for 6 months and attended a later meeting, sponsored by the Brazilian Association of Attention-Deficit Disorder (www.tdah.org.br), making comments, adding new data and correcting different parts of the review. The preliminary version was presented in the XXIII Brazilian Congress of Psychiatry in 2005, in which comments and suggestions by the professionals were recorded and later considered to be incorporated in the final version, whose text is presented next.

PERSISTENCE OF SYMPTOMS IN ADULTS

Longitudinal studies have shown that the ADHD persists in adult life in around 60-70% of cases.[7] The differences found in the remission rates are more attributed to the different definitions of ADHD across time than to the disorder course along life,[8] and more restricted diagnostic criteria are associated with lower persistence rates in adult life. Those differences may also vary according to the method used: self-reports by young adults previously diagnosed may generate very low persistence percentages, when compared to the percentages obtained when the parents are interviewed.[9] The presence of ADHD in the parents does not seem to affect the reliability of their self-report about the symptoms in their children.[10] The use of empirical criteria, such as the total number of symptoms above 1.5 standard deviations beyond the expected (in epidemiological samples) may produce higher values.[11] Despite the difficulties discussed in this text, it is possible to

perform a reliable diagnosis of ADHD in adults when well defined criteria are used, such as those mentioned below.[12-14] In a recent epidemiological study, the validation of the ADHD diagnosis in adults was demonstrated through a factor analysis of self-reported symptoms in an adult population, in which the individuals with more core symptoms of ADHD presented worse indicators of global functioning,[15] controlled for other factors.

NEUROBIOLOGICAL FINDINGS

In a recent systematic review, the comparison between data concerning prevalence, comorbidity profile, genetic and drug treatment efficacy in children and adolescents, based on studies carried out in Brazil and in developed countries, clearly suggests that the ADHD is not a cultural construct.[16]

The neurobiological changes in adults with ADHD, including the standards of genetic transmission and the findings of neuropsychological and neuroimaging studies, are similar to those found in children and adolescents with the disorder, which confirms the validation of the adult form.[13,17] Studies involving families, adoption and twins indicate that the ADHD is a strongly inherited disorder.[18] Preliminary researches with PET scan and magnetic nuclear resonance with spectroscopy, although such examinations are not indicated for the diagnosis of ADHD, indicate the presence of changes in frontal lobes, corpus callosum, basal ganglia and cerebellum.[19-21]

There are two models that are most used in the understanding of the impairments associated with the ADHD. The first one emphasizes the role of the executive disorder secondarily to a deficient inhibitory control, as a result of changes in the dorsal frontal-striatal circuit and the dopaminergic mesocortical innervation. Barkley[22] theorized that the ADHD may be understood as the expression of a central inhibition deficit (hybrid model theory), as mentioned earlier. The second model sees the ADHD as the result of a deficit in the signaling of late rewards, secondarily to changes in the motivational processes that involve the ventral frontal-striatal circuit and mesolimbic branches, especially those that end in the nucleus accumbens.[23] The adoption of a single

neurobiological etiological model seems to be insufficient until the moment to explain the great heterogeneity observed in the performance in neuropsychological tests.[24]

Several studies have investigated the presence of neuropsychological deficits, particularly of executive functions in adults with ADHD. A recent meta-analysis study[25] revealed **moderate** effect sizes and the absence of universality of executive function impairments (in tests) in samples of adults with ADHD. Despite the executive impairments (attention deficits included) being frequent, neuropsychological examinations do not have enough predictive value to be recommended for the diagnosis in adults.[26] Besides the research environment, they are particularly indicated when there is suspicion of comorbid learning disability or when there is a persistence of learning problems after the treatment of ADHD.[27]

CLINICAL STATUS OF ADHD IN ADULTS

Despite the symptoms of hyperactivity and impulsivity significantly reducing at the end of adolescence,[28] adults with ADHD maintain the triad of symptoms: inattention, impulsivity and hyperactivity at varied degrees. The symptoms in the adult life are manifested in the activities typical of this age group; therefore, the hyperactivity observed in children may correspond to excessive activities and/or work in adults (workaholics). Similarly, the impulsivity may be manifested in ending relationships prematurely or in impulsive driving, with a “correspondence” between the symptoms in children and adolescents, such as mentioned in the DSM-IV, and those in adult life.[29] The inattention in adults may be seen in conversations, in tasks that require organization and maintaining the attention for a long time, and in memory difficulties.

Like children and adolescents, adults with ADHD have an **unconscious** ability to concentrate, but are not able to do it under specific circumstances, such as when they are involved in tasks that are particularly stimulating to them. Their difficulty becomes more evident in situations in which they are bored or distracted by internal (emotions) or external stimuli, in levels

significantly higher than the ones observed in the general population,[30] compromising the performance of tasks.

Despite not being contemplated by the DSM-IV, the sleep disorders may be common in the ADHD.[31] They may persist until adult age, when delaying the time to go to bed due to involvement in stimulating activities is often reported, as well as difficulty to wake up in the morning and excessive daytime sleepiness, mainly when there are tedious tasks or activities that require the maintenance of attention for a long time. The phenotypes of sleep disorders and ADHD have characteristics in common, and the high prevalence of sleep-wake disturbances reported by individuals with ADHD may be due to the strong relation between the systems involved in the sleep-wake regulation and those involved in the regulation of attention and mood.[32]

Five out of the nine symptoms of the inattention module of the DSM-IV criterion A refer to executive and memory functions, corroborating the hypotheses of executive function impairment, as previously mentioned. Other executive functions that may be impaired in the ADHD comprehend: independent activation of the tasks, persistence, planning, organization, self-monitoring, impulse control, priority setting, decision making, and integration of different mental activities from time to time, among others.[30] The executive functions allow the individual to perform voluntary, independent, autonomous and goal-oriented actions. In practical terms, the impairment of such functions causes problems in the estimate and use of time, in the fulfillment of obligations, besides the difficulties of putting into practice propositions and agreements made in the theoretical plan. An executive function impairment is less perceived in children, simply because they are supervised (at home and at school) and have less need of establishing planning strategies for themselves, hierarchy of priorities, etc. These functions play an increasingly more important role as the individual matures and his ability of autonomously making decisions and solving everyday problems starts being required.

Criteria for the diagnosis of ADHD in adults

The symptoms that represent the base of the ICD-10 (World Health Organization) and DSM-IV systems for the diagnosis of ADHD in children and adolescents are similar. However, the ICD-10 presents major differences, which culminate in a more restrictive diagnosis: a) it demands a concomitance of the following symptoms: inattention, hyperactivity and impulsivity; b) it excludes the diagnosis in the presence of comorbidity with anxiety and depression; and c) it demands the criteria to be fully met in at least two contexts. Therefore, patients with a predominantly inattentive type are not diagnosed by the ICD-10, which is officially used in Brazil; moreover, using the criteria of such system, only the most severe cases (according to the DSM-IV system) will be diagnosed.

Two diagnostic systems are more used for the diagnosis of ADHD in adults: the Wender-Utah diagnostic criteria[33] and the DSM-IV,[4] by the American Psychiatric Association. The Wender-Utah criteria have significantly contributed to the consolidation of the validation of the adult form of ADHD, and had its internal consistency recently confirmed.[34] Their main merits were: a) having emphasized the need to demonstrate symptoms referring back to childhood; b) encouraging the data collection from third parties; and c) emphasizing the need to demonstrate the presence of the social-occupational impact in adults. In spite of that, the Utah criteria have some limitations: a) they do not cover the predominantly inattentive form; b) they exclude the ADHD diagnosis in the presence of major depression or antisocial personality disorder (which later proved to be found in association with the ADHD); and c) they include the symptoms irritability and explosive temper, now considered independent of the ADHD, which potentially only contributes to the diagnosis of more severe cases and/or other disorders similar to the ADHD or comorbidities.[35,36]

With regard to the DSM-IV, the clinical symptoms presented were conceived based on field studies, with children and adolescents between 7 and 17 years, using as cut-off point six out of nine symptoms of inattention and/or six out of nine symptoms of hyperactivity/impulsivity (criterion A).[37] This cut-off point is considered by some as restrictive for use in adults.[38,39] Even though,

several clinical, pharmacological, genetic and neuroimaging studies have used the DSM-IV, adapting the symptoms indicated by it.

The DSM-IV symptoms and its cut-off point (criterion A)

The use of rating scales

Rating scales are useful for measuring ADHD symptoms and their magnitude, but its use must be considered as a tool to aid the diagnosis of the disorder, without replacing the clinical interview.[19]

There are scales to evaluate the symptoms referring back to childhood (Attention Deficit Hyperactivity Disorder Rating Scale – ADHD-RS)[40] and current symptoms (Conners' Adult Attention-Deficit Rating Scale – CAARS),[41] as well as semi-structured (Conners' Adult ADHD Diagnostic Interview for the DSM-IV – CAADID)[42] and structured interviews (Mini-International Neuropsychiatric Interview).[43] Some scales allow the investigation of the severity of the current symptoms based on the Wender-Utah diagnostic system (see below), such as the Wender-Reimherr Adult ADD Scale (WRAADS).[44] Self-reporting (Barkley's Current Symptoms Scale – Self-Report Form)[45] and interviewer-administered questionnaires (Brown's Attention Deficit Disorder Scales – BADDS)[46] may also be useful in the investigation of ADHD symptoms in adults.

A review carried out by a consulting group established by the World Health Organization considered that the available scales and the semi-structured interviews to be used in adults (including the MINI-Plus) either did not comprehend all the 18 items of the DSM-IV, or included questions considered inadequate to investigate them.[47] Based on that evaluation, a group of researchers created the Adult Self-Report Scale (ASRS), version 1.1, to be used in adults (available at http://www.hcp.med.harvard.edu/ncs/asrs.php).

The ASRS scale has 18 items, which comprehend the symptoms of the DSM-IV criterion A, modified to suit the adult life context. It offers five response options: never, rarely, sometimes, often, and very often. With regard to the validation for the American population, in some questions (items 3, 4, 5 and 9 of part A and items 2, 7 and 9 of part B) the response involving a lower

frequency was considered "positive" ("sometimes"), but for most items, only the responses involving the frequencies "often" and "very often" were considered positive. So far there are no data for the Brazilian population, which suggests a careful approach when considering the responses "sometimes" as positive or even using the total score as a parameter, until there are data available in the country. The ASRS was validated in an adult population of the USA in the National Comorbidity Survey-Replication. There is an ASRS screener, which consists of only six items of the same scale (items 4, 5, 6 and 9 of part A and items 1 and 5 of part B), to be used in population studies. In case the 18-item version is being used (parts A+B), the same cut-off point established in the DSM-IV is followed: positive individuals are those who present at least six symptoms in at least one of the domains (inattention – items 1 to 9 of part A – and hyperactivity/impulsivity – items 1 to 9 of part B) or in both domains. It is worth highlighting that the ASRS is used to identify symptoms of criterion A, but for the diagnosis of ADHD in adults, the other criteria determined by the DSM-IV must be met (see below).

The ASRS scale was submitted to a semantic validation in our country[48] and may be used as a self-reporting instrument, whose responses should be exemplified and detailed during the visit to the doctor (appendix 1). The responses provided by the ASRS do not replace the clinical interview, in which all the core symptoms of ADHD must be questioned. In a research environment, semi-structured interviews are used. In our country,[49] an adapted version of Kiddie SADS-E (K-SADS-E) has already been used. It is a semi-structured interview widely used in the evaluation of children and adolescents,[50] as well as of adults.[51]

Appendix 1 - Translation into Brazilian Portuguese of the Adult Self-Report Scale[48]					
Por favor, responda as perguntas abaixo avaliando-se de acordo com os critérios do lado direito da página. Após responder cada uma das perguntas, circule o número que corresponde a como você se sentiu e se comportou nos últimos seis meses. Por favor, dê este questionário completo ao profissional de saúde para que vocês possam discuti-lo na consulta de hoje.	**Nunca**	**Raramente**	**Algumas vezes**	**Freqüentemente**	**Muito freqüentemente**
1. Com que freqüência você comete erros por falta de atenção quando tem de trabalhar num projeto chato ou difícil?	0	1	2	3	4
2. Com que freqüência você tem dificuldade para manter a atenção quando está fazendo um trabalho chato ou repetitivo?	0	1	2	3	4
3. Com que freqüência você tem dificuldade para se concentrar no que as pessoas dizem, mesmo quando elas estão falando diretamente com você?	0	1	2	3	4
4. Com que freqüência você deixa um projeto pela metade depois de já ter feito as partes mais difíceis?	0	1	2	3	4
5. Com que freqüência você tem dificuldade para fazer um trabalho que exige organização?	0	1	2	3	4
6. Quando você precisa fazer algo que exige muita concentração, com que freqüência você evita ou adia o início?	0	1	2	3	4
7. Com que freqüência você coloca as coisas fora do lugar ou tem dificuldade de encontrar as coisas em casa ou no trabalho?	0	1	2	3	4
8. Com que freqüência você se distrai com atividades ou barulho à sua volta?	0	1	2	3	4
9. Com que freqüência você tem dificuldade para lembrar de compromissos ou obrigações?	0	1	2	3	4
PARTE A - TOTAL					
1. Com que freqüência você fica se mexendo na cadeira ou balançando as mãos ou os pés quando precisa ficar sentado(a) por muito tempo?	0	1	2	3	4
2. Com que freqüência você se levanta da cadeira em reuniões ou em outras situações onde deveria ficar sentado(a)?	0	1	2	3	4
3. Com que freqüência você se sente inquieto(a) ou agitado(a)?	0	1	2	3	4
4. Com que freqüência você tem dificuldade para sossegar e relaxar quando tem tempo livre para você?	0	1	2	3	4
5. Com que freqüência você se sente ativo(a) demais e necessitando fazer coisas, como se estivesse “com um motor ligado”?	0	1	2	3	4
6. Com que freqüência você se pega falando demais em situações sociais?	0	1	2	3	4
7. Quando você está conversando, com que freqüência você se pega terminando as frases das pessoas antes delas?	0	1	2	3	4
8. Com que freqüência você tem dificuldade para esperar nas situações onde cada um tem a sua vez?	0	1	2	3	4
9. Com que freqüência você interrompe os outros quando eles estão ocupados?	0	1	2	3	4
PARTE B - TOTAL					

Similarly to what occurs to several other psychiatric disorders, adults with ADHD may provide, in general, satisfactory reports about their symptoms and the impact such symptoms have on their lives.[51] Studies comparing the self-report of individuals and the report of informants tend to show the same level of discrepancy seen when the self-report of children is compared to the self-report of parents, with a tendency to have a lower number of symptoms in the reports made by the individuals themselves.[52,53] Some authors suggest the data collection with informants (husband, wife, parents, etc.), both with regard to the symptoms and to their associated impairment.[27]

Onset age (criterion B)

The onset age before 7 years has been questioned as a diagnostic criterion, once it does not have an empirical base and imposes practical difficulties.[54] In cases of diagnosis only in adult life, it is even more difficult to establish the onset age; it is possible to find, in clinical practice, individuals with later onset of symptoms.[55] The report of early onset of symptoms is not necessarily associated with the report of concomitant functional impairment, especially in cases where inattention is prevalent.[56] Even more, the neurobiological understanding of the ADHD emphasizes the interaction of the biological vulnerability and the environment. Therefore, individuals with intermediate vulnerability could manifest the phenotypical aspects of the disorder only in high-demand environments, which are characteristics of the adult life.[57] Although a history of symptoms of inattention and/or hyperactivity/impulsivity referring back to childhood or beginning of adolescence is necessary, one should not dismiss the possibility of diagnosis in a well characterized case, but with onset of symptoms (in the amount demanded by the cut-off point, i.e., at least six symptoms of inattention and/or hyperactivity/impulsivity) after 7 years.

Presence of symptoms in different contexts (criterion C)

Children and adolescents with ADHD are referred for presenting problems that interfere with other people – at home or at school. Nonetheless, adults primarily seek treatment due to the self-identified difficulties of low productivity, disorganization, impaired planning, impulsivity,

among others. The DSM-IV indicates the need of impairment in at least two contexts, which should be maintained in the evaluation of adults. Impairments restricted to a specific context or situation (for example, reading) suggest another diagnosis.

With regard to adults, they are the ones who provide the data that will allow the professional to evaluate the presence of symptoms in several contexts, such as: marital life, family environment, work, management of financial resources, social life, among others.[26] As mentioned above, the data collection with an informant may be useful.

Functional impairment (criterion D)

Epidemiological studies indicate that the prevalence of ADHD is overestimated when the functional impairment is not evaluated.[58]

The ADHD is associated with a significant impairment in several areas of the individual's life. Data from the literature show a higher incidence of delinquency, accidents, unemployment and suspension of the driver's license.[59-61] The prevalence of adults with ADHD in prisons is higher than expected according to the frequency of the disorder in the population,[62] which has already been documented in adolescents in our country.[63] A significantly more severe history of alcohol and drugs may be seen in adults with ADHD;[18,64] smoking is also common.[65] A higher incidence of sexually transmitted diseases[66] has been documented. The incidence of marital problems and the divorce rates are higher in individuals with ADHD.[67] Lower schooling rates are also seen.[60,61,65] Adult who self-refer to ADHD specialized services may present higher indices of anxiety and depression than children with ADHD followed until adult life.[68,69] Despite the functional impairment being a major feature in the adult form of ADHD, it is not specific and can be found in several other disorders different from the ADHD. The National Comorbidity Survey-Replication showed that adults with a diagnosis of ADHD tended to present worse scores in the rating scales of global functioning and impairment in a series of cognitive measures.[70]

In the evaluation of the adult, the impairment must be **clinically significant** and investigated in several different contexts. It may refer to an unhappy marriage, in which one person is

chronically inattentive and disorganized, often seeking new and exciting activities in order to keep "active" and "in a good mood", besides having professional difficulties due to poor performance secondary to inattention and difficulty to comply with routines and schedules. The diagnostic of ADHD in individuals who may have **to a certain extent** adapted their life styles to the ADHD symptoms (thus minimizing the self-reported impairment) must be done cautiously.[30] In the clinical evaluation, the impairment may also be inferred by the discrepancy between the performance and what is expected by the global cognitive level, as well as by the comparison between the peers of the same specific group (professional, academic, etc.).[64]

Although early researches have indicated different clinical outcomes for men and women, more recent studies[71] – including in our country[72] –, in which there was a control of referring biases, showed that there were no significant differences. The outcomes seem to be related to the ADHD subtype (with more impairment in the combined subtype), and there is no influence of gender. In the same studies, both with clinical samples, there were no differences between genders in the frequency of ADHD subtypes.

Understanding the nature of the symptoms (criterion E)

For the diagnosis of the adult, it is necessary to evaluate whether there are comorbidities that may justify the reported symptoms and impairment. The presence of psychiatric comorbidities is extremely common in ADHD, in children and adolescents and in adults as well, and significantly changes the clinical presentation of the prognosis.[73] In the National Comorbidity Survey-Replication,[71] the diagnosis of other psychiatric disorders in adults with ADHD was significantly higher than what is expected by the respective prevalence in the general population.[74] In our country, a study with children and adolescents showed that the profile of comorbidities in the ADHD is similar even in different sociocultural contexts.[75] Many symptoms of the DMS-IV listed for the ADHD are identical or similar to symptoms listed in the diagnosis of other disorders, and the

differential diagnosis demands a specialized evaluation.[65] Inattention, for example, is one of the symptoms listed for the diagnosis of mood disorder in the DSM-IV system.

The compliance with criterion E does not mean the diagnosis of one or more disorders in association with the ADHD should not be made. For example, the differential diagnosis between the Bipolar Mood Disorder and the ADHD may be difficult in some cases, but the comorbidity between these disorders changes the clinical presentation and the evolutionary course, besides having an undisputable therapeutic relevance.[76] The diagnosis of some comorbidities may remain even after considering the core symptoms of ADHD[77] (exclusion diagnosis); however, the definition regarding the existence of more than one disorder is not based on such strategy, being an eminently clinical decision.

FINAL CONSIDERATIONS AND CONCLUSION

The diagnosis of ADHD in adults is still clinical, being obtained through a careful anamnesis, use of well defined clinical criteria and training in the differential diagnosis of psychiatric disorders. Despite the reports of electroencephalographic, neurofunctional and neuroimaging changes, such tests and laboratory examinations **do not** have enough predictive value (both positive and negative) to allow its use in the clinical environment, being reserved for research environment or exceptional cases. The clinical method is still the most appropriate instrument to avoid the overinclusion of cases, especially with regard to the suspicion of ADHD diagnosis by self-referred lay individuals.

Therefore, the following is recommended for the diagnosis of ADHD in adults:

a) The use of scales (such as the ASRS) and adapted semi-structured interviews (such as the K-SADS-E), which have been used in our country and are based on the criteria of the DSM-IV diagnostic system;

b) The data collection with other information sources (parents, husband, wife, other relatives, etc.);

c) The identification of a higher number of core symptoms of ADHD (inattention, hyperactivity and impulsivity), as well as of its early onset and its presence in different contexts of the individual's life;

d) The identification of a significant functional impairment associated with the symptoms, investigating different areas, such as the professional, social, family, etc.;

e) The clinical decision of the symptoms can no longer be justified by other psychiatric disorders(s), which must be investigated during the individual's clinical evaluation.

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ABSTRACT

Present difficulties in the diagnosis of attention-deficit/hyperactivity disorder in adults have prompted Brazilian specialists involved in research in this area to make a consensus to be used in the country. A non-systematic preliminary review was repeatedly evaluated by all authors, who added new material, commented and corrected parts of the text for 6 months through electronic mail and a further meeting sponsored by the Brazilian Association of Attention-Deficit Disorder. The preliminary version was publicly presented during the annual congress of the Associação Brasileira de Psiquiatria (Brazilian Association for Psychiatry) for appraisal and suggestions from participants in order to prepare the final version.

Keywords: *Attention-deficit/hyperactivity disorder, ADHD, diagnosis, adults.*

Title: *Brazilian consensus of specialists on the diagnosis of attention-deficit/hyperactivity disorder in adults*

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