

## ADHD ASSESSMENT IN ADULTS: A REVIEW OF THE DEVELOPMENT, ADAPTATION AND APPLICATIONS OF THE CAARS

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### **Abstract**

*The aim of this study was to understand the nature of ADHD diagnosis in adults by reviewing the structure, development, and application of a diagnostic measure used for the same. For this purpose, the Connors' Adult ADHD Rating Scale was chosen since it is one of the most commonly used measures to diagnose ADHD in adults. This paper discusses the development of the test, the process of standardization and the various forms of the test that may be used for making the diagnosis. Additionally, the tool's possible applications and evaluation are stated. This includes the use of ADHD diagnostic measures for patients who suffer from intellectual disabilities or other developmental issues in order to identify whether comorbid conditions exist, in the area of de-addiction and rehabilitation to understand potential underlying causes for substance use, in institutes for higher education to identify reasons for academic difficulties and psycho-social and emotional issues, and in parenting programs to provide support to parents who suffer from ADHD. The review concludes that while the CAARS may be used as an adequate initial screening test to rule out ADHD, care should be taken while using it as a catch-all diagnostic tool for ADHD in adults.*

### **Keywords**

*ADHD, Adults, CAARS, Diagnosis, Evaluation*

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The American Psychological Association (2021) defines ADHD, or attention-deficit hyperactivity disorder, as a behavioral condition that makes focusing on everyday requests and routines challenging. They state that people with ADHD typically have trouble getting organized, staying focused, making realistic plans and thinking before acting. They may be fidgety, noisy and unable to adapt to changing situations. According to the National Institute of Mental Health (2021), researchers are unsure what causes ADHD, while several studies indicate that genes play a significant influence. ADHD, like many other illnesses, is most likely the result of a combination of factors. Aside from genetics, researchers are investigating probable environmental variables that may increase the likelihood of having ADHD, as well as how brain damage, diet, and social situations may play a role in ADHD.

Men are more likely than women to have ADHD, while women with ADHD are more likely to exhibit predominantly inattention symptoms. ADHD is frequently comorbid with other illnesses such as learning disabilities, anxiety disorder, conduct disorder, depression, and substance use. In terms of diagnosis, the DSM 5 states that ADHD is characterized by a persistent pattern of inattention and/or hyperactivity/impulsivity that interferes with functioning or development. Unlike the 6 symptom criteria for diagnosis of ADHD in children, to diagnose ADHD in adults, only 5 of the symptoms identified in the DSM need to be present. In addition to this, symptoms might look different at older ages. For example, in adults, hyperactivity may appear as extreme restlessness or wearing others out with their activity.

According to Pollak et al (2021), ADHD is one of the earliest consistent indicators of long-term poor health outcomes, including mental and physical health complications, smoking and drug use, risky behavior, and accidental injury. Adaptability, or the ability to productively adjust to new or changing environments, has been linked to behavioral, cognitive, and emotional regulation, according to research by Martin et al. (2012). Individuals who are deficient in behavioral, cognitive, and emotional regulation processes may be less adaptable and more vulnerable to stress during times of transition. Indeed, ADHD, which has long been associated with lower behavioral, cognitive, and emotional regulating skills (Barkley, 1997), has also been linked to greater difficulty in handling higher stress levels (Jordan et al., 2020). Several research findings that support this are as follows: Individuals with ADHD are more likely to use maladaptive coping strategies such as escape-avoidance (wishful thinking and behavioral efforts to escape or avoid the situation), confrontational (aggressive efforts to alter the situation), and unplanned problem-solving (lack of deliberate problem-focused efforts to alter the situation) when confronted with stressful episodes (Hampel et al., 2008; Oster et al., 2020;

Young, 2005). Adults with ADHD reported more stress throughout their transition to college, as well as poor coping methods and decreased flexibility (Martin & Burns, 2014). Individuals with ADHD report higher emotional discomfort, increased alcohol and caffeine usage, and lower quality of life when transitioning to military duty in nations such as Korea, Singapore, and the United States (Cipollone et al., 2020; Noh et al., 2018). Keeping all these factors in mind, the diagnosis and subsequent management of ADHD in both children and in adults is of paramount importance. As stated previously, the diagnostic criteria for the two age groups vary with reference to the number of symptoms that need to be present as well as the ways in which the symptoms present themselves.

According to most clinicians, the diagnosis of ADHD in adults is a complex process that cannot be done through the use of any single test. As a result, clinicians typically rely on multiple sources of information to make ADHD diagnoses. This takes place through the use of tools such as symptom checklists, a detailed history of past and current functioning, family history of inattentive and/or hyperactive behavior, observer reports by close family and friends, and self-report measures. One of the most frequently used measures to make the diagnosis of ADHD in adults, however, is the Connors' Adult ADHD Rating Scale (CAARS). This prevalence of usage, therefore, warrants a thorough understanding of the measure and what its usage entails.

#### **Connors' Adult ADHD Rating Scale (CAARS)**

The Connors' Adult ADHD Rating Scale (CAARS) is one of the many measures that have been developed over the past few decades in order to identify, diagnose and subsequently treat ADHD in adults. It is a set of three scales (short, long, screening) grouped together, and the various scales provide differing scores and vary in reliability and validity.

The long version rating scales include measures of Inattention/Memory problems, Hyperactivity/Restlessness, Impulsivity/Emotional Lability, Problems with Self-Concept, DSM-IV Inattentive Symptoms, DSM-IV Hyperactive-Impulsive Symptoms, DSM-IV ADHD Symptoms Total, and ADHD Index. The short version rating scales only include DSM-IV Inattentive Symptoms, DSM-IV Hyperactive-Impulsive Symptoms, DSM-IV ADHD Symptoms Total, and ADHD Index.

Although the CAARS is based on the DSM IV diagnostic criteria of ADHD, it can be observed that overall, the revisions to ADHD in DSM5 are less dramatic than updates to earlier DSMs. Importantly, the DSM-5 ADHD and Disruptive Behaviour Disorders Workgroup decided neither to modify the core ADHD symptom domains (i.e., Inattention and Hyperactivity/Impulsivity) nor to revise the 18 core

symptoms, aside from adding example behaviors to better define some of the symptoms for older adolescents and adults.

As stated previously, the diagnosis of ADHD, especially in the case of adults, is a complex process, and for this reason, the CAARS was constructed in order to make the process of reaching a diagnosis easier. The CAARS are available in three forms, in both self-report and observer reports. The long form (CAARS-S:L; CAARS-O:L) consists of 66 items with 9 subscales. The short form (CAARS-S:S; CAARS-O:S) contains 26 items and 6 subscales. The screening form (CAARS-S:SV; CAARS-O:SV) contains 30 items and the 3 DSM-IV ADHD symptoms measures, along with the ADHD Index.

<b>Subscales</b>	<b>Scales</b>	<b>Long Form</b>	<b>Short Form</b>	<b>Screening Form</b>
Factor-Derived subscales	Inattention/Memory Problems	Present (12 items)	Present (5 items)	-
	hyperactivity/Restlessness	Present (12 items)	Present (5 items)	-
	Impulsivity/Emotional Lability	Present (12 items)	Present (5 items)	-
	Problems with Self-Concept	Present (6 items)	Present (5 items)	-
DSM-IV ADHD Symptoms subscales	Inattentive Symptoms	Present (9 items)	-	Present (9 items)
	Hyperactive-Impulsive Symptoms	Present (9 items)	-	Present (9 items)
	Total ADHD Symptoms subscale	Present	-	Present
ADHD Index	Contains the set of items that will distinguish ADHD adults from nonclinical adults	Present (12 items)	Present (12 items)	Present (12 items)
Inconsistency Index	Can be used to identify haphazard responses or difficulty in understanding the measure	Present	Present	Present

### Reliability, Validity and Norms

S. No.	Reliability type	Men	Women
1.	Internal Consistency using Cronbach's alpha across age, subscales and forms	0.64 to 0.91	0.49 to 0.90
2.	Mean inter-item correlations using Cronbach's alpha across age, subscales and forms	0.31 to 0.68	0.26 to 0.63
3.	Test-retest reliability	.88 to .91 for the CAARS-S:L, calculated based on 33 men and 28 women who were seen at an adult ADHD clinic.	
		.85 to .95 for the CAARS-O:L, evaluated from a sample of nonclinical individuals (24 men and 26 women) who were rated by their spouses.	

The ADHD Index used in the forms was cross-validated on a sample (N = 192) of ADHD and non-ADHD adults (Conners et al., 1999). It was found that sensitivity was 71%, specificity was 75%, positive predictive power was 74%, negative predictive value was 72%, the false positive rate was 25%, the false negative rate was 29%, kappa coefficient was 0.458, and overall classification rate was 73%. These results indicate the ADHD Index may be used to identify adults who would benefit from a full assessment (Conners et al., 1999).

The CAARS was seen as being highly correlated with other self-report ADHD measures, and initial studies on diagnostic accuracy for adult ADHD found the CAARS to have diagnostic sensitivity of 82% and specificity of 87% relative to healthy controls (Erhardt et al., 1999).

However, in research by Harrison et al. (2016), it was found that the CAARS exhibited a 69% overall discriminant validity and a considerably high false positive and false negative rate. With decreased prevalence rates, a high CAARS score offered just a 22% probability of correctly diagnosing people with ADHD.

The CAARS self-report forms norms were developed on 1,026 adults aged 18 through 50 years and higher. The observer norms were developed on 943 individuals. Individuals who participated were from the United States and Canada. No other specific information is provided for the sample. Age and gender differences were found in the data analysis resulting in separate norms for age and gender.

## **Discussion**

The aim of this study was to understand the nature of ADHD diagnosis in adults by reviewing the structure, development, and application of a diagnostic measure used for the same. For this purpose, the Connors' Adult ADHD Rating Scale was chosen since it is one of the most commonly used measures to diagnose ADHD in adults. The details of the development of the test, the process of standardization and the various forms have been discussed in the previous section. The tool's applications and subsequent evaluation are discussed below.

### **Applications and Evaluation of the CAARS**

ADHD assessment tools can be used in a wide range of settings and can have a number of advantages, some of which have been researched and proven. One example of this is the detection of ADHD in adults with intellectual disabilities. In research from La Malfa et al. (2008), the CAARS was used as a screening measure for 46 adults with ID, and the resulting prevalence of ADHD was seen in about one-fifth of the sample. The researchers consequently concluded that not only can ADHD be a valid psychiatric diagnosis for a child with ID but for an adult with ID as well, and that the CAARS can be considered a useful clinical instrument to survey ADHD in ID. The research emphasizes the comorbidity of ADHD with other neurodevelopmental disorders and highlights the need for integrated treatment plans that would be able to optimally manage both disorders and aid the patient's overall functioning.

La Malfa et al.'s research (2008) also highlights the feasibility of using the CAARS as a diagnostic tool for those adults who did not get accurately diagnosed as children, and the possibility of the subsequent opening up of those avenues of support- be it therapeutic, pharmaceutical, or communal- that were previously closed to them.

Along these lines, a correct diagnosis of ADHD can also enable patients to seek out pharmacological treatment for their symptoms. Researchers Agarwal et al. (2012), who conducted a review study on the quality of life of adults with ADHD found that pharmacological treatment and early diagnosis have a positive impact on outcomes, long-term prognosis, and quality of life in adults with ADHD. The use of the CAARS could be beneficial in such circumstances.

Yet another area that could benefit from the use of comprehensive ADHD assessment measures is de-addiction and rehabilitation. In a survey to study the life-long consequences of ADHD, Novelli (2004) found that adults with ADHD are more likely to engage in harmful or antisocial behaviors, like smoking and drug use. In addition, people with ADHD are twice as likely to have been arrested, with 37

percent of the adults with ADHD surveyed acknowledging a prior arrest. The use of the CAARS in rehabilitation centers could prove useful in getting targeted treatment and therapeutic intervention for affected adults.

The use of the CAARS could also be useful in institutes for higher education. As per Green and Rabiner (2012), research suggests that college students with ADHD experience less academic success and greater psychological and emotional difficulties than other students and use alcohol and drugs at higher rates. According to one research (Shaw-Zirt et al., 2005), students with ADHD reported lower levels of social adjustment, social skills, and self-esteem than a control group of non-disordered peers. Along similar lines, Blase et al. (2009) found that students with self-reported ADHD acknowledged more concerns about their social relationships than did their peers. The use of ADHD assessment tools in academic institutions could enable and incentivize the institutions and other welfare bodies catering to the campus to provide academic support and counseling to students who get diagnosed.

Lastly, like in educational institutions, the use of the CAARS could also prove to be useful in parenting programs to provide support to parents who have ADHD. In research from Weinstein et al. (1998), it was seen that mothers with ADHD reported significantly higher levels of neuroticism and less conscientiousness and agreeableness than mothers without ADHD. These differences may emerge as difficulties in parenting tasks requiring regulation of anger in response to child misbehavior, organization, or cooperation with the parent (e.g., agreeableness). Conversely, the lack of differences in traits of extroversion and openness highlights parenting situations that could be areas of relative strength for parents with ADHD, such as a willingness to try new adventures with the child, and spontaneity or strong positive emotions in interactions with the child. A diagnosis could be particularly useful in terms of helping the ADHD-having parent in managing their own disorder, as well as helping their child manage theirs, in the case their child inherits it—a strong possibility, considering the overall high heritability of ADHD from parent to child throughout the lifespan (Larsson et al., 2013).

### **Conclusion**

The primary objective of diagnosis and treatment of neurodevelopmental disorders is to help individuals be more effective in their daily life and to lessen the extent to which untreated ADHD interferes with their well-being and day-to-day functioning. People with ADHD who do not get access to proper treatment would be more likely to keep attempting the same, possibly maladaptive methods that would not be effective in the long run, if they do not have the deeper knowledge and support that comes from an accurate diagnosis. For this reason, getting a diagnosis

is an essential first step in the process of managing ADHD as an adult, and from the review of literature, the CAARS appears to be a frequently used tool for initial assessment and subsequent diagnosis. An important thing to note, however, is the previously mentioned research finding by Harrison et al. (2016), which showed that the CAARS has a considerably high false positive and false negative rate in terms of diagnosis. Findings like these add to the world of considerable ambiguity surrounding measures for the assessment of ADHD in adults and highlight a need for re-evaluating how neurodevelopmental disorders are assessed and diagnosed. Thus, while the CAARS may be used as an adequate initial screening test to rule out ADHD, care should be taken while using it as a catch-all diagnostic tool for ADHD in adults.

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