

Supplementary Online Content

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This supplementary material has been provided by the authors to give readers additional information about their work.

eTable 1. ADHD Assessment in Young Adulthood

^a Criterion B was not used for the diagnosis of ADHD in young adulthood

^b This strategy for assessing impairment was chosen to mimic approaches in clinical settings, in which clinicians tend to rely on the subject's general perception of impairment, instead of on extensive evaluations of correlates of functioning. Clinicians tend to assess ADHD impairment based on patient's perceptions.¹

Screening assessment	Considering that this is a large population study, we initially applied a screening questionnaire using the same structure as the six-question World Health Organization Adult ADHD Self-Report Scale Screener (ASRS) for all subjects. ASRS includes six questions about ADHD symptoms (four inattention items: "Does not follow through", "Difficulty organizing tasks", "Forgetful", "Reluctant to engage in 'mental' tasks"; and two hyperactivity items: "Fidgets", and "On the go"). In a previous population study, ASRS had a 97.9% total classification accuracy using a cut-off of 4/6 screening symptoms and considering blind clinical assessment as the gold standard. ¹ In our questionnaire, the six ASRS questions were adapted to the exact DSM-5 wording. In order to enhance sensitivity, any subject with two or more positive questions among the six was considered screening positive, and answered 12 additional questions about the 12 remaining ADHD symptoms.
Criterion A	There were 18 questions about DSM-5 ADHD symptoms (one question for each symptom) – 6 questions were included as part of the screening instrument and 12 additional questions were applied afterwards among those screening positive. The questions were formulated exactly as proposed by DSM-5. <i>Positive if at least five symptoms of inattention or five symptoms of hyperactivity-impulsivity.</i>
Criterion B	We asked "did you have several of these symptoms before age 12?" with possible answers being none (0), a few (1), many (2), a lot (3). <i>Positive if answered many (2) or a lot (3)^a.</i>
Criterion C	Subjects were asked if they presented symptoms in at least two of the three main settings: home, social and work/school environments. <i>Positive if answered affirmatively.</i>
Criterion D	The following question was asked: "how much do these symptoms impair your life in school, work, at home, or with friends and family?" The response options were: none (0), a little (1), fairly (2), or a lot (3). ^b <i>Positive if answered fairly (2) or a lot (3).</i>

eTable 2. Assessments of Correlates in Young Adulthood

Confidential interview^a	
Tobacco smoking	We asked “Did you ever have the habit of smoking at least once a week?” and, if answered positively, “do you still smoke?” <i>Positive if both answered affirmatively.</i>
Illicit drug use	For each common illicit drug in Brazil (marijuana, cocaine, solvents, ecstasy, crack and LSD), we asked: “What is your personal use of ...?”, and each question could be answered: never used (0), I have tried once (1), I don’t use it anymore (2), I use it once in a while (3), I use it every weekend (4), I use it everyday (5). <i>Positive if answered at least I use it once in a while (3) for any drug.</i>
Teenage pregnancy ^b	We asked females “Have you ever been pregnant, even if you have not delivered?” <i>Positive if answered affirmatively.</i>
Sexually transmitted diseases	We asked: “Has any health professional or doctor ever told you that you had a sexually transmitted disease?” <i>Positive if answered affirmatively.</i>
Criminal behavior ^c	We assessed 13 types of self-reported criminal behaviors committed in the previous 12 months. Questions on violent crime were: stealing from person with threat/force, assault, carrying a weapon for fights or self-defense, using a weapon. <i>Positive if any question answered affirmatively.</i>
Correctional institution	We asked “have you ever been interned in a correctional institution for minors?” <i>Positive if answered affirmatively.</i>
Standard interview^a	
Years of schooling	We asked what was the last year of regular schooling completed at the moment of interview.
Personal income	We asked what was the subject’s monthly income earned with his own work in absolute number and local currency.
Traffic accidents	We asked: “Have you ever been involved in a traffic accident?” <i>Positive if answered affirmatively.</i>
Intelligence quotient	We used an abbreviated version of the Weschler Adult Intelligence Scale third edition (WAIS-III) with 4 subscales: similarities, arithmetic, picture completion and digit-symbol coding. ² We used the Brazilian version of WAIS-III. ³

^a The confidential interview was a self-applied questionnaire under interviewer supervision. The standard procedure interview included the subject and his/her family (when available).

^b According to the World Health Organization, any pregnancy until age 19 is considered teenage pregnancy.⁴

^c Further details on criminal behavior assessment and data on this cohort can be found elsewhere.⁵

eTable 3. Secondary Analyses

Confounder	Rationale	Strategy
Effect of missing data in young adult assessment.	Subjects lost to follow-up could represent a different profile (e.g., more severe presentation) and our estimate of persistence might be underestimated.	We compared those lost in the follow-up with those that were retained in several demographic and symptomatic variables (e.g., sex, family income, education of the subject and the head of the family, SDQ hyperactivity scale scores at 11 years). No significant difference emerged. Thus, extrapolating the same rate of persistence found in the general sample for the missing cases, the persistence rate would be 17.2%.
Effect of medication use at the time of young adult assessment.	Treatment for ADHD in the last assessment might have reduced symptoms, underestimating persistence.	Only 10 subjects were using stimulants (n=6) or imipramine (n=4) at 18/19 years confirming our previous findings showing clear ADHD under treatment in Brazil. ⁶ Three of them were already in the YA-ADHD group. Thus, medication use did not influence our findings.
Effect of performance of the screening instrument in childhood.	If the screening instrument had a low sensitivity, we would be underestimating rates of C-ADHD among subjects with YA-ADHD.	We conducted secondary analyses with a very low cut-off score for the SDQ hyperactivity scale (score = 5; no requirement of impairment). This threshold was derived by both an old three-band and a more recent four-band approach for categorizing SDQ scores, suggesting that scores equal or lower than 5 are normal in clinical and populational studies (see – http://sdqinfo.org). A cut-off of 5 would result in a sensitivity of 95% for ADHD according to our analyses of the SDQ hyperactivity scale performance for ADHD diagnosis in a subsample with DAWBA diagnoses. With this cutoff, still 51.4% of the YA-ADHD cases did not have C-ADHD.
Effect of different information sources in childhood and young adulthood.	Since our definition of C-ADHD was based on parental reports of symptoms and our definitions of adult ADHD groups were derived from self-reports, one might speculate that our low rates of C-ADHD in adult ADHD cases might solely represent a disagreement between information sources.	We compared the rate of self-report scores on the hyperactivity scale of the SDQ administered to the children at age 11 between the two adult ADHD groups (YA-ADHD and YA-ADHD-WC) and subjects without YA-ADHD. As expected due to sample size, differences were nominally significant. However, mean (SD) symptom scores in the groups were very similar: YA-ADHD = 3.94 (2.27); YA-ADHD-WC = 3.93 (2.24); and adults without YA-ADHD = 3.26 (2.23). Effect sizes (Cohen's d) were 0.3 comparing YA-ADHD vs subjects without A-ADHD ($p < 0.001$), and 0.3 comparing YA-ADHD-WC vs subjects w/o YA-ADHD ($p < 0.001$). In other words, in both groups (YA-ADHD and YA-ADHD-WC), the mean self-report score at age 11 was far below the threshold used for ADHD diagnosis in childhood according to parental reports (score = 8). We also compared the scores on the hyperactivity scale of the self-report version of the SDQ between the C-ADHD group (defined according to parent scores on the same scale) and subjects without C-ADHD [C-ADHD = 4.71 (2.32) vs. subjects w/o C-ADHD = 3.2 (2.21), $p < 0.001$, Effect Size = 0.68]. Thus, the magnitude of the effect size comparing hyperactivity assessed via self-report at 11 years between the YA-ADHD group and subjects w/o A-ADHD was much
Confounder	Rationale	

		smaller than the one comparing the C-ADHD group Strategy
		(defined according to parent scores on the same scale) and subjects without C-ADHD (0.3 vs. 0.68). If just an effect of different information sources explained the low ADHD diagnostic rate in childhood among cases with YA-ADHD, we would expect similar effect sizes across these two comparisons. In other words, we would expect an effect size comparing hyperactivity assessed by self-report at 11 years between the A-YADHD group and subjects w/o A-ADHD as high as that comparing C-ADHD and subjects w/o C-ADHD.
Combined effects of different factors	The confounding effect of comorbidities in adulthood, different information sources and performance of the screening instrument in childhood could operate additively.	We assessed the prevalence rate of subjects fulfilling the following criteria: a) YA-ADHD w/o comorbidity; and b) SDQ- hyperactivity scale scores equal or lower to 5 by both parents and child's reports. This ultraconservative analysis still showed that 22.8% of our subjects with YA-ADHD would retain the ADHD diagnosis in adulthood.
Effect of our ADHD diagnostic process in young adults based on a two-stage design.	The use of the DSM-5 adapted ASRS for ADHD screening in adulthood might have missed some cases.	A significant number of 2,671 subjects (66.8% of the total sample) presented a negative screening for the disorder and therefore answered only the six screening questions. For prevalence assessment, we assumed that those who screened negative for ADHD did not have the disorder. This assumption allowed us to assess the prevalence of ADHD for the entire population sample, but it is theoretically possible (although clinically unlikely) that our approach missed some ADHD cases (e.g., if someone had one positive inattentive or hyperactive/impulsive symptom in the screening, he/she might still have 4 inattentive or hyperactive/impulsive symptoms among the 12 symptoms not assessed). However, mathematical modeling with the 1,833 subjects that had only one screening positive symptom in the screening assessment suggests that this possibility would not increase substantially the number of ADHD cases. ⁷
Effect of excluding cases with subthreshold levels of ADHD	Subjects with childhood ADHD that retained less than 5 symptoms and were still impaired were not included in the persistence estimate.	We defined a subgroup as subthreshold ADHD at age 18/19 if subjects had 3 or 4 symptoms of inattention and/or hyperactivity-impulsivity and reported at least moderate impairment. With this definition, 129 subjects were defined as having Subthreshold Adult ADHD, and 13 of those had a childhood history of ADHD. If subthreshold cases were included in the analyses, this would increase the persistence rate to 18.6%.

eTable 4. Comparison of SDQ Hyperactivity Scores at Age 11 Between Young Adults With and Without ADHD in Young Adulthood

YA-ADHD = Young Adult ADHD

	YA-ADHD		YA Without ADHD		p-value	Effect size (Cohen's d)
	Mean	SD	Mean	SD		
Parental score on SDQ hyperactivity subscale	4.96	3.02	4.22	3.1	< 0.001	0.24
Self-report score on SDQ hyperactivity subscale	3.94	2.27	3.26	2.23	< 0.001	0.3

eTable 5. Comparison of Young Adult Outcomes Between Neurotypical Children With and Without Young Adult ADHD

YA-ADHD = Young Adult ADHD

	Neurotypical YA-ADHD (n = 182)	Neurotypical w/o YA- ADHD (n = 1636)	
ADULT OUTCOMES	%	%	p-value
Traffic accidents	17.6	14.1	.208
Criminal behavior – violent	17.6	9.8	.002
Criminal behavior – any	18.9	11.1	.004
Incarceration	1.6	0.2	.001
Tobacco smoking	13.7	9.6	.095
Illicit drug use	8.2	5.8	.196
Suicide attempt	15.4	3.4	< 0.001
Teenage pregnancy	10.8	10.2	.859
Sexually transmitted diseases	6.6	2.1	< 0.001
	M (SD)	M (SD)	
Intelligence Quotient	97.92 (11.56)	99.77 (12.05)	.048
Years of education	8.54 (2.17)	8.65 (2.33)	.554
Personal income	479.2 (226.36)	487.56 (288.55)	.721

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