NEWSLETTER

INDICE:

ISTITUTO DI RICERCHE FARMACOLOGICHE MARIO NEGRI · IRCCS

BIBLIOGRAFIA ADHD SETTEMBRE 2019

Actas Esp Psiquiatr. 2019 Mar;47:45-53.

PREVALENCE OF ADHD IN MEXICAN SCHOOLCHILDREN THROUGH SCREENING WITH CONNERS SCALES 3.

Gallardo-Saavedra GA, Martinez-Wbaldo MDC, Padron-Garcia AL.

INTRODUCTION: The prevalence of Attention Deficit Hyperactivity Disorder (ADHD) in children varies due to the methodology used. In Mexico, the health sector recognizes difficulties in measuring and treating it, so the WHO recommends carrying out screening in populations with a probability of presenting it. The objective was to measure the prevalence of ADHD for screening purposes in second-grade students, their comorbidity, and to describe the experience using version 3 of the Conners scale.

METHOD: Descriptive observational study, with the purpose of screening, applying the short versions to parents and teachers of 3,985 schoolchildren in a sample of 55 public schools obtained at random from two delegations in Mexico City, the cases were referred to psychology and psychiatry to corroborate diagnosis and treatment.

Results We detected 458 (16%) cases, both informants, the prevalent subtype was hyperactive in both sexes, predominantly male, learning problems and executive functions more frequent in girls with hyperactive and combined subtype, only completed the psychological evaluation 150 schoolchildren and 127 attended with the paidopsiquiatra, who confirmed 72% of the cases.

CONCLUSIONS: The prevalence for screening purposes, subtype of ADHD and affected gender is similar to that reported in the literature, the comorbidity identified by both informants is an advantage offered by the Conners scale 3, the limiting factor to corroborate the diagnosis was the resistance of the parents to go with the specialists. It is necessary to guide and inform parents more about the disorder to achieve better participation

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Per la ricerca degli articoli pubblicati nella letteratura scientifica nel mese in esame sono state consultate le banche dati Medline, Embase, PsycINFO e PsycArticle utilizzando le seguenti parole chiave (o i loro sinonimi): 'Attention deficit disorder', 'Attention deficit hyperactivity disorder', 'Infant', 'Child', 'Adolescent', 'Human'. Sono qui riportate le referenze considerate rilevanti e pertinenti.

Actas Esp Psiquiatr. 2019 Mar;47:54-60.

EFFECT OF THE HERVAT NEUROEDUCATIONAL PROGRAM ON EVOKED POTENTIAL P300 IN CHILDREN WITH ATTENTION DEFICIT DISORDER.

Ortiz T, Turrero A, Lopez-Ibor MI.

INTRODUCTION: Attention deficit disorder (ADD) has been investigated from various perspectives. However, the neurobiological mechanisms underlying this condition remain unknown. Evoked potentials, including P300, can be used to investigate the processes underlying deficient attentional and cognitive functions in children with ADD.

METHODS: In this study, we analyze the effect of a neuroeducational program, HERVAT (Hidratacion [hydration], Equilibrio [balance], Respiracion [breathing], Vision [vision], Audicion [hearing], Tacto [touch]), on evoked potential P300 in a group of children aged 7-11 years with ADD.

RESULTS: At the end of the study, the latency of P300 improved and brain activity was reorganized toward frontal areas in children with ADD who undertook the HERVAT program. In the control group, on the other hand, the latency of P300 and the posterior cortical areas remained unchanged during tests to discriminate between multisensory stimuli.

CONCLUSIONS: In conclusion, the neuroeducational program HERVAT effectively shortened the latency of evoked potential P300, which is responsible for information processing in the brain, and reorganized brain activity from posterior areas toward frontal cortical areas, which are responsible for the attentional processes involved in executive function

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Addictive Behaviors. 2019;99.

ADULT SUBSTANCE USE AS A FUNCTION OF GROWTH IN PEER USE ACROSS ADOLESCENCE AND YOUNG ADULTHOOD IN THE CONTEXT OF ADHD: FINDINGS FROM THE MTA.

Kennedy TM, Howard AL, Mitchell JT, et al.

Peer substance use strongly predicts adolescent and young adult substance use, but its role in ADHD-related risk for substance use, especially in adulthood, is unclear. In a sample with (n = 516) and without (n = 249) childhood ADHD from the Multimodal Treatment Study of ADHD, we compared associations between change over time in peer substance use and personal substance use (alcohol, cigarettes, marijuana, illicit drugs) from age 14ΓÇô26 by ADHD status. Developmentally typical peer substance use trajectories across adolescence and young adulthood coincided with similar changes in personal use ΓÇô but less so for those with ADHD histories. Concurrent associations between peer and personal use in adolescence and young adulthood were weaker for those with ADHD histories than without for commonly used substances (alcohol, marijuana). Prospectively, escalating peer use during adolescence forecasted adulthood declines for commonly used substances, yet persistently high substance use at age 25, regardless of ADHD history. In the reverse direction, growth in adolescent substance use predicted developmentally normative young adult declines in peer use ΓÇô but for the ADHD group, adolescent heavy drinking predicted increases in young adult peer use. Findings suggest that individuals with ADHD may have difficulty emulating their peers' developmentally normative declines in substance use, highlighting the importance of social factors when treating young adults affected by ADHD and substance abuse

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ADHD Atten Deficit Hyperact Disord. 2019.

SLUGGISH COGNITIVE TEMPO: LONGITUDINAL STABILITY AND VALIDITY.

Vu A, Thompson L, Willcutt E, et al.

Emerging research has identified sluggish cognitive tempo (SCT) as a construct separate from ADHD predominately inattentive presentation. The present study explores the longitudinal stability of SCT over a period of 7-áyears, specifically the independent effects of SCT on behavioural and academic outcomes concurrently over a 3-year period. A sample of 639 twins, aged 6ΓÇô12-áyears, participating in the Western Reserve Reading and Math Project (WRRMP) were assessed at seven annual home visits. The WRRMP sample is an unselected sample of twins representative of the general population of typically developing school-age children. The current investigation will focus on parent and teacher reports which assess attention

deficit hyperactive/impulsive disorder (ADHD) and standardized achievement measures which assess academic outcomes. Over periods longer than 1 or 2-áyears, SCT does not display good longitudinal stability (r <.60). SCT also does not have consistent significant independent effects on academic outcomes once the effects of ADHD were controlled for. Over a 7-year period, SCT does not demonstrate consistent longitudinal stability. SCT significantly predicts social problems, internalizing behaviours, and anxious/depressive behaviours after the effects of ADHD are controlled for. SCT has no significant independent effects on cognitive or educational outcomes after the effects of inattentive ADHD are controlled for

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ADHD Atten Deficit Hyperact Disord. 2019;11:255-62.

PRESCRIBING FOR YOUNG PEOPLE WITH ATTENTION DEFICIT HYPERACTIVITY DISORDER IN UK PRIMARY CARE: ANALYSIS OF DATA FROM THE CLINICAL PRACTICE RESEARCH DATALINK.

Newlove-Delgado T, Hamilton W, Ford TJ, et al.

Guidance on management of attention deficit hyperactivity disorder (ADHD) in the UK was issued by the National Institute for Clinical Excellence in 2008. No UK study has examined all psychotropic prescribing in young people with ADHD since the introduction of the guidance; this is especially relevant due to the high prevalence of psychiatric comorbidity in this population. The aim of this study was to describe primary care prescribing of ADHD and other psychotropic medications for young people with ADHD. The analysis of records of patients with an ADHD diagnosis in the UK Clinical Practice Research Datalink from 2005 to 2013 was performed. Estimation of the prevalence of prescribing of ADHD and other psychotropic medications over 8-year follow-up for cases aged 10-20 years in 2005 was carried out. Of 9390 ADHD cases, 61.6% [95% confidence interval (CI) 60.6-62.5%] had a prescription at some point for ADHD medication. Prescribing of other psychotropic medications was higher in girls than in boys (36.4% vs. 22.7%; $p < 0.001$). ADHD prescribing prevalence declined steeply between the ages of 16 and 18 from 37.8% (95% CI 36.6-38.9) to 23.7% (95% CI 22.7-24.6%). There was a parallel increase in prescribing of other psychotropics from 3.8% (95% CI 3.4-4.3%) to 6.6% (95% CI 6.0-7.3%). There is scope to optimise the management of ADHD and psychiatric comorbidities in young people, and there is a need for sustainable models of ADHD care for young adults, supported by appropriate training and specialist services

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ADHD Atten Deficit Hyperact Disord. 2019;11:311-24.

TEMPERAMENTAL NEGATIVE AFFECT, EMOTION-SPECIFIC REGULATION, AND CONCURRENT INTERNALIZING AND EXTERNALIZING PATHOLOGY AMONG CHILDREN WITH ADHD .

Leaberry KD, Rosen PJ, Slaughter KE, et al.

Children with attention-deficit/hyperactivity disorder (ADHD) experience high rates of temperamental negative affect and comorbid internalizing and externalizing pathology. The current study explored the role of emotion-specific regulation in accounting for the link between temperamental negative affect and psychopathology among children with ADHD. Forty parents of children ages 8ΓÇô11 (N =29 males, N =11 females) completed measures of child temperament, emotion-specific dysregulation (i.e., anger dysregulation, sadness dysregulation), and psychopathology. Children completed a measure of emotion-specific dysregulation. Results revealed that anger dysregulation fully statistically accounted for the relationship between temperamental negative affect and concurrent externalizing problems. Sadness dysregulation did not account for the relationship between temperamental negative affect and internalizing problems. These novel findings implicate the robust role of anger dysregulation in explaining the link between temperamental negative affect and concurrent externalizing pathology. The results of this study have significant implications for the treatment of emotionally driven externalizing behavior among children with ADHD

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ADHD Atten Deficit Hyperact Disord. 2019;11:233-40.

THE EARLY MOTOR DEVELOPMENT IN CHILDREN DIAGNOSED WITH ADHD: A SYSTEMATIC REVIEW.

Havmoeller SR, Thomsen PH, Lemcke S.

Although there is limited knowledge about early signs of ADHD, deviations in motor development are suggested as a possible indicator of such early signs. The purpose of the present systematic review was to gather knowledge about motor development before three years of age in children later diagnosed with ADHD. A systematic search was completed in four research databases, and the quality of the identified studies was systematically assessed. Of 440 initial search results, only five studies met the inclusion criteria and were fully abstracted. Major methodological heterogeneity was found between the studies, and the results are pointing in various directions. One study found an association between delay in gross motor development and ADHD, while another did not. However, associations between both good early motor development as well as delayed were also found in one study. A study of premature infants showed no association between early motor development and attention problems at school age, and a study of high-risk children from a neonatal care unit found no association between abnormal general movements and later ADHD without comorbidity. The results of the studies are pointing in various directions. No firm conclusion can be drawn on early motor development in children with ADHD due to the very different results of the studies and the methodological heterogeneity

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Adm Policy Ment Health. 2018 Nov;45:958-77.

INFLUENCES TO ADHD PROBLEM RECOGNITION: MIXED-METHOD INVESTIGATION AND RECOMMENDATIONS TO REDUCE DISPARITIES FOR LATINO YOUTH.

Haack LM, Meza J, Jiang Y, et al.

ADHD problem recognition serves as the first step of help seeking for ethnic minority families, such as Latinos, who underutilize ADHD services. The current mixed-method study explores underlying factors influencing recognition of ADHD problems in a sample of 159 school-aged youth. Parent-teacher informant discrepancy results suggest that parent ethnicity, problem domain, and child age influence ADHD problem recognition. Emerging themes from semi-structured qualitative interviews/focus groups conducted with eighteen Spanish-speaking Latino parents receiving school-based services for attention and behavior concerns support a range of recognized ADHD problems, beliefs about causes, and reactions to ADHD identification. Findings provide recommendations for reducing disparities in ADHD problem recognition and subsequent help seeking

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Aggress Behav. 2018 Jul;44:416-25.

EXPERIENCES OF PHYSICAL AND RELATIONAL VICTIMIZATION IN CHILDREN WITH ADHD: THE ROLE OF SOCIAL PROBLEMS AND AGGRESSION.

McQuade JD, Breslend NL, Groff D.

The social risk factors for physical and relational peer victimization were examined within a mixed-gender sample of children with and without attention-deficit/hyperactivity disorder (ADHD). Participants were 124 children (ages 8-12 years; 48% boys), with 47% exhibiting sub-clinical or clinical elevations in ADHD symptoms. ADHD and oppositional defiant disorder (ODD) symptom counts were assessed based on parent- and teacher-reports; parents rated children's social problems and teachers rated children's use of physical and relational aggression and experiences of physical and relational victimization. A multiple mediator model was used to test whether there were indirect effects of ADHD or ODD symptoms on physical and relational victimization through social problems, physical aggression, or relational aggression. At the bivariate level, ADHD and ODD symptoms were both significantly associated with higher rates of physical and relational victimization. In the mediational model, there were significant indirect effects of ADHD symptoms on relational victimization via social problems, of ODD on relational victimization via relational aggression, and of ODD symptoms on physical victimization via physical aggression. Results suggest that there are distinct risk factors implicated in the physical and relational victimization of youth with ADHD and that the co-occurrence

of ODD symptoms is important to assess. Clinical implications for addressing victimization in children with ADHD are discussed

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Am J Epidemiol. 2018 Dec;187:2717-18.
RE: "PRENATAL EXPOSURE TO ACETAMINOPHEN AND RISK FOR ATTENTION DEFICIT HYPERACTIVITY DISORDER AND AUTISTIC SPECTRUM DISORDER: A SYSTEMATIC REVIEW, META-ANALYSIS, AND META-REGRESSION ANALYSIS OF COHORT STUDIES".
Damkier P.

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Am J Epidemiol. 2018 Dec;187:2718.
FOUR AUTHORS REPLY.
Matok I, Masarwa R, Levine H, et al.

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Am J Med Genet B Neuropsychiatr Genet. 2018 Sep;177:589-95.
A RARE EXONIC NRXN3 DELETION SEGREGATING WITH NEURODEVELOPMENTAL AND NEUROPSYCHIATRIC CONDITIONS IN A THREE-GENERATION CHINESE FAMILY.
Yuan H, Wang Q, Liu Y, et al.
Members of the neurexin gene family, neurexin 1 (NRXN1), neurexin 2 (NRXN2), and neurexin 3 (NRXN3) encode important components of synaptic function implicated in autism and other neurodevelopmental/neuropsychiatric disorders. Loss of function variants have been reported predominantly in NRXN1, with fewer such variants detected in NRXN2 and NRXN3. Evidence for segregating NRNX3 variants has particularly been lacking. Here, we report identification by chromosomal microarray analysis of a rare exonic deletion affecting the NRXN3 alpha isoform in a three-generation Chinese family. The proband, a 7-year-old boy, presented with motor and language delay and met the clinical diagnostic criteria for autism. He also presented with moderate intellectual disability, attention-deficit hyperactivity disorder and facial dysmorphic features. The mother and maternal grandfather, both deletion carriers, presented with variable degrees of language and communication difficulties, as well as neuropsychiatric problems such as schizophrenia and temper tantrums. A compilation of sporadic cases with deletions involving part or all of NRXN3 revealed that 9 of 23 individuals (39%) displayed features of autism. The evidence for cosegregation in our family further supports a role for NRXN3 in autism and neurodevelopmental/neuropsychiatric disorders but demonstrates intrafamily variable expressivity due to this NRXN3 deletion, with schizophrenia and facial dysmorphism being potential novel features of NRXN3 haploinsufficiency

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Am J Med Genet B Neuropsychiatr Genet. 2018 Dec;177:746-64.
DRD4 METHYLATION AS A POTENTIAL BIOMARKER FOR PHYSICAL AGGRESSION: AN EPIGENOME-WIDE, CROSS-TISSUE INVESTIGATION.
Cecil CAM, Walton E, Pingault JB, et al.
Epigenetic processes that regulate gene expression, such as DNA methylation (DNAm), have been linked to individual differences in physical aggression. Yet, it is currently unclear whether: (a) DNAm patterns in humans associate with physical aggression independently of other co-occurring psychiatric and behavioral symptoms; (b) whether these patterns are observable across multiple tissues; and (c) whether they may function as a causal versus noncausal biomarker of physical aggression. Here, we used a multisample, cross-tissue design to address these questions. First, we examined genome-wide DNAm patterns (buccal swabs; Illumina 450k) associated with engagement in physical fights in a sample of high-risk youth (n = 119; age = 16-24 years; 53% female). We identified one differentially methylated region in DRD4, which survived genome-wide correction, associated with physical aggression above and beyond co-occurring

symptomatology (e.g., ADHD, substance use), and showed strong cross-tissue concordance with both blood and brain. Second, we found that DNAm sites within this region were also differentially methylated in an independent sample of young adults, between individuals with a history of chronic-high versus low physical aggression (peripheral T cells; ages 26-28). Finally, we ran a Mendelian randomization analysis using GWAS data from the EAGLE consortium to test for a causal association of DRD4 methylation with physical aggression. Only one genetic instrument was eligible for the analysis, and results provided no evidence for a causal association. Overall, our findings lend support for peripheral DRD4 methylation as a potential biomarker of physically aggressive behavior, with no evidence yet of a causal relationship

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Am J Psychiatry. 2019;176:754-62.

CONTINUED BENEFITS OF METHYLPHENIDATE IN ADHD AFTER 2 YEARS IN CLINICAL PRACTICE: A RANDOMIZED PLACEBO-CONTROLLED DISCONTINUATION STUDY.

Matthijssen A-F, Dietrich A, Bierens M, et al.

Objective: The benefits of long-term use of methylphenidate treatment in children and adolescents with attention deficit hyperactivity disorder (ADHD), as frequently prescribed in clinical practice, are unclear. The authors investigated whether methylphenidate remains beneficial after 2 years of use.

Methods: Ninety-four children and adolescents (ages 8ΓÇô18 years) who had been treated in regular care with methylphenidate for more than 2 years were randomly assigned to double-blind continuation of treatment for 7 weeks (36 or 54 mg/day of extended-release methylphenidate) or gradual withdrawal over 3 weeks, to 4 weeks of placebo. The primary outcome measure was the investigator-rated ADHD Rating Scale (ADHD-RS); secondary outcome measures were the investigator-rated Clinical Global Impressions improvement scale (CGI-I) and the Conners' Teacher Rating Scale-Revised: Short Form (CTRS-R:S). Continuous ratings were analyzed with mixed model for repeated measures analyses, and the CGI-I with a chi-square test.

Results: The mean ADHD-RS scores at baseline for the continuation and discontinuation groups, respectively, were 21.4 (SD=9.7) and 19.6 (SD=8.9); after 7 weeks, the mean scores were 21.9 (SD=10.8) and 24.7 (SD=11.4), with a significant between-group difference in change over time of 24.6 (95% CI=28.7, 20.56) in favor of the group that continued methylphenidate treatment. The ADHD-RS inattention subscale and the CTRS-R:S ADHD index and hyperactivity subscale also deteriorated significantly more in the discontinuation group. The CGI-I indicated worsening in 40.4% of the discontinuation group, compared with 15.9% of the continuation group.

Conclusions: Continued treatment with methylphenidate remains effective after long-term use. Some individual patients may, however, be withdrawn from methylphenidate without deterioration. This finding supports guideline recommendations that patients be assessed periodically to determine whether there is a continued need for methylphenidate treatment

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Ann Nutr Metab. 2019;75:152.

FORMULATION OF INSTANT SURABI FROM COMPOSITE RICE-SOYBEAN FLOURS AND SUPPLEMENTED WITH TORBANGUN POWDER AS AN ALTERNATIVE SNACK FOR ADHD CHILDREN.

Muninggar DHR, Damanik MRM.

Background/Aims: Attention Deficit Hyperactivity Disorder (ADHD) is one of the most prevalent neurobehavioral disorders among children where they experience low protein intake and micronutrient deficiencies, such as iron and calcium. However, a special diet as an alternative medication has not been evaluated yet. This study aimed to develop an instant traditional pancake (surabi) based on composite flours from rice flour and soybean flour that was supplemented with Torbangun powder as an alternative snack for ADHD children.

Methods: This study used completely randomized factorial design with two factors: ratio between rice flour and soybean flour (75:25; 70:30; 65:35) and the addition of Torbangun powder (3%; 5%; 7%). Samples produced were then tested for hedonic test.

Results: Panelists' preference was significantly different ($p < 0.05$) for color, odor and flavor of the samples. Based on results of hedonic test and physicochemical characteristics, the suggested formulation was the

one with 65:35 ratio between rice flour and soybean flour and 5% addition of Torbangun powder. Per 100 g wet basis, the selected sample contained 62.68 g moisture, 1.30 g ash, 6.81 g protein, 0.75 g fat, 28.47 g carbohydrate, 88.62 mg calcium, 4.14 mg iron, and 144 kcal energy.
Conclusions: Development of instant surabi from composite flours from rice flour and soybean flour with addition of Torbangun powder could be an alternative snack for ADHD children

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Appl Clin Inform. 2018 Oct;9:892-904.
SHARING OF ADHD INFORMATION BETWEEN PARENTS AND TEACHERS USING AN EHR-LINKED APPLICATION.
Michel JJ, Mayne S, Grundmeier RW, et al.
BACKGROUND: Appropriate management of attention-deficit/hyperactivity disorder (ADHD) involves parents, clinicians, and teachers. Fragmentation of interventions between different settings can lead to suboptimal care and outcomes. Electronic systems can bridge gaps across settings. Our institution developed an email-based software to collect ADHD information from parents and teachers, which delivered data directly to the clinician within the electronic health record (EHR).
OBJECTIVE: We sought to adapt our institution's existing EHR-linked system for ADHD symptom monitoring to support communication between parents and teachers and then to assess child characteristics associated with sharing of ADHD information.
METHODS: We updated our software to support automated sharing of ADHD information between parents and teachers. Sharing was optional for parents but obligatory for teachers. We conducted a retrospective cohort study involving 590 patients at 31 primary care sites to evaluate a system for sharing of ADHD-specific health information between parents and teachers. We used multivariable logistic regression to estimate associations between child characteristics and parental sharing. We further investigated the association between child characteristics and viewing of survey results delivered through the electronic communication system.
RESULTS: Most parents (64%) elected to share survey results with teachers at the first opportunity and the vast majority (80%) elected to share all possible information. Parents who elected to share usually continue sharing at subsequent opportunities (89%). Younger child age and performance impairments were associated with increased likelihood of sharing. However, parents viewed only 16% of teacher submitted surveys and teachers only viewed 30% of surveys shared by parents.
CONCLUSION: This study demonstrates that electronic systems to capture ADHD information from parents and teachers can be adapted to support communication between them, and that parents are amenable to sharing ADHD information with teachers. However, strategies are needed to encourage viewing of shared information

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Appl Neuropsychol Child. 2019 Apr;8:174-81.
HOW NEUROPSYCHOLOGY CAN INFORM OUR UNDERSTANDING OF PRESCHOOL ADHD: CLINICAL AND RESEARCH IMPLICATIONS.
Aretouli E.
Neuropsychological assessments in preschoolers have not received as much attention as in older children and adults. Attention-deficit/hyperactivity disorder (ADHD) is a common disorder that occurs in early childhood associated with poor academic and personal outcomes, such as learning and social difficulties. Preschoolers with ADHD may present cognitive deficits that are related with the ADHD symptoms of inattention, hyperactivity, and impulsivity, but may also interfere, beyond and above the ADHD symptoms, with everyday functioning. Most importantly, cognitive deficits in preschoolers seem to predict future ADHD symptoms. Yet, the practice of neuropsychological assessment in this age-group has been limited. The present selective review highlights the contribution of comprehensive neuropsychological assessments to the early identification of symptomatic preschoolers and to our understanding of the nature and developmental trajectory of ADHD

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Appl Neuropsychol Child. 2019 Apr;8:132-39.

NEUROCOGNITIVE AND NEURODEVELOPMENTAL IMPACT OF PRENATAL METHAMPHETAMINE EXPOSURE: A COMPARISON STUDY OF PRENATALLY EXPOSED CHILDREN WITH NONEXPOSED ADHD PEERS.

Brinker MJ, Cohen JG, Sharrette JA, et al.

Prenatal methamphetamine exposure has become an increasingly pervasive concern, especially in rural-based populations and populations of lower socioeconomic status. While research has begun to highlight the effects of prenatal methamphetamine exposure, the long-term impact of this exposure remains an under-investigated topic. This study attempts to investigate the neurocognitive and neurodevelopmental effects of prenatal methamphetamine exposure by comparing the index and full-scale IQ scores on the WISC-IV between a sample of clinically referred children prenatally exposed to methamphetamine (N = 80) and a sample of clinically referred nonexposed children diagnosed with ADHD (N = 44). Children prenatally exposed to methamphetamine showed significantly lower scores on all WISC-IV domains when compared to peers with ADHD. When taking into account polysubstance exposure to alcohol, these differences remained statistically significant, with the exception of the Processing Speed Index (PSI); children reported to have been prenatally exposed to methamphetamine and to alcohol (PME) remained below ADHD peers on all other WISC-IV index scores. Within the prenatally exposed sample, regression analyses indicated that age was a significant negative predictor of PSI scores. Overall findings suggest that prenatal methamphetamine exposure is associated with a notable cognitive impact independent of polysubstance exposure to alcohol, and that the impact of this exposure on processing speed skills may become more pronounced with age

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Appl Psychophysiol Biofeedback. 2018 Dec;43:283-92.

EFFECTS OF NEUROFEEDBACK TRAINING ON PERFORMING BIMANUAL COORDINATION IN-PHASE AND ANTI-PHASE PATTERNS IN CHILDREN WITH ADHD.

Norouzi E, Hossieni F, Solymani M.

It is generally accepted that children with attention-deficit/hyperactivity disorder (ADHD) have poor motor control, especially in bimanual coordination tasks. Such children characteristically have impaired fine motor ability, problems with force control, and poor motor coordination. They are at particular risk of loss of motor control and reduced bimanual coordination. We tested whether, compared to a control condition, neurofeedback training (NFT) could improve bimanual coordination among children with ADHD. 20 Children with ADHD (mean age 7.9 years; SD 2.11) were randomly assigned either to NFT or to a control condition. All participants completed a bimanual coordination test at the following time points: baseline, assessment 1, assessment 2, assessment 3, and again 12 session later at posttest. NFT consisted of Sensory Motor Rhythm (SMR) training to achieve increased SMR in C3 and C4, while participants in the control condition were under mock NFT conditions. Bimanual coordination accuracy and consistency improved from baseline to completion of the intervention (significant Time effect), but in the NFT condition (significant time x group interaction). Compared to the control condition, the NFT group had fewer errors in both patterns of bimanual coordination (significant Group effect). Among children with ADHD, SMR neurofeedback training (NFT) led to significant improvements in a bimanual coordination task. The SMR NFT thus appears to have the potential to improve and enhance the motor control of ADHD patients

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Asia Pac J Clin Nutr. 2018;27:1325-31.

DIETARY AND NUTRIENT STATUS OF CHILDREN WITH ATTENTION-DEFICIT/ HYPERACTIVITY DISORDER: A CASE-CONTROL STUDY.

Chou WJ, Lee MF, Hou ML, et al.

BACKGROUND AND OBJECTIVES: Nutritional and dietary habits may affect children's behaviors and learning. The etiology of attention-deficit/hyperactivity disorder (ADHD), a common neurodevelopmental disorder in children, may be associated with unhealthy diets or nutrients deficiencies. The purpose of this study was to examine whether children with ADHD exhibited different dietary habits or nutrient profiles from healthy control subjects.

METHODS AND STUDY DESIGN: We recruited 42 patients with ADHD (mean age: 8.1 years) and 36 healthy children as the control group (mean age: 9.8 years). We adopted the ADHD Rating Scale and the Swanson, Nolan, and Pelham Version IV Scale to interview both the ADHD patients and the control subjects and then evaluated participants' dietary intake with a food frequency questionnaire. Logistic regression models were utilized to produce a composite dietary/nutrient score, while receiver operating characteristic (ROC) was adopted to differentiate between the two participant groups.
RESULTS: Compared to the control children, children with ADHD demonstrated a higher intake proportion of refined grains ($p=0.026$) and a lower proportion of dairy ($p=0.013$), calcium ($p=0.043$), and vitamin B-2 ($p=0.024$). We observed that the composite score of dietary and nutrient could significantly distinguish patients with ADHD from healthy controls ($p<0.001$). The composite dietary/nutrient score demonstrated a significant correlation with the severity of ADHD clinical symptoms ($p<0.05$).
CONCLUSIONS: ADHD children and healthy controls have different dietary patterns and that dietary and nutrient factors may play a role in the pathophysiology of ADHD. Clinicians should consider dietary habits and specific nutrients in the routine assessment of children with ADHD

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Aust New Zealand J Psychiatry. 2019;53:760-71.

ALTERED SOCIAL COGNITION AND CONNECTIVITY OF DEFAULT MODE NETWORKS IN THE CO-OCCURRENCE OF AUTISTIC SPECTRUM DISORDER AND ATTENTION DEFICIT HYPERACTIVITY DISORDER.

Wang K, Xu M, Ji Y, et al.

Objective: As two common neurodevelopmental disorders, autistic spectrum disorder and attention deficit hyperactivity disorder frequently occur together. Until now, only a few studies have investigated the co-occurrence of attention deficit hyperactivity disorder and autistic spectrum disorder, this is due to restrictions associated with previous Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Text Revision. Most previous research has focused on the developmental trajectories for autistic spectrum disorder and attention deficit hyperactivity disorder separately, while the neural mechanisms underpinning the co-occurrence of autistic spectrum disorder and attention deficit hyperactivity disorder remain largely unknown.
Methods: We studied 162 autistic spectrum disorder individuals (including 79 co-attention deficit hyperactivity disorder and 83 non-attention deficit hyperactivity disorder patients) and 177 typical developing individuals using resting-state functional magnetic resonance imaging data from the Autism Brain Imaging Data Exchange II, an aggregated magnetic resonance imaging dataset from 19 centers. Independent component analysis was used to extract sub-networks from the classic resting-state networks. Functional connectivity values within (intra-iFC) and between (inter-iFC) these networks were then determined. Subsequently, we compared the ASD_coADHD group with the ASD_nonADHD group in relation to the abnormal intra-iFC and inter-iFC of autistic spectrum disorder group relative to the typical developing group.
Results: The ASD_coADHD group showed more severe social impairment and decreased intra-iFC in the bilateral posterior cingulate cortex of the default mode network (independent component 17) and increased inter-iFC between the default mode network (independent component 8) and the somatomotor networks (independent component 2) compared to the ASD_nonADHD group. In addition, the strength of the intra-iFC in the default mode network was associated with the severity of autistic traits across the entire autistic spectrum disorder group and particularly the ASD_coADHD group.
Conclusion: Our results showed that dysfunction of the default mode network is a central feature in the co-occurrence of autistic spectrum disorder and attention deficit hyperactivity disorder, including connectivity within the default mode network as well as between the default mode network and the somatomotor networks, thus supporting the existence of a clinically combined phenotype (autistic spectrum disorder + attention deficit hyperactivity disorder)

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Autism Res. 2019.

FAMILIAL CONFOUNDING OF THE ASSOCIATION BETWEEN MATERNAL SMOKING IN PREGNANCY AND AUTISM SPECTRUM DISORDER IN OFFSPRING.

Kalkbrenner AE, Meier SM, Madley-Dowd P, et al.

Evidence supports no link between maternal smoking in pregnancy and autism spectrum disorder (autism) overall. To address remaining questions about the unexplained heterogeneity between study results and the possibility of risk for specific autism sub-phenotypes, we conducted a whole-population cohort study in Denmark. We followed births 1991ΓÇô2011 (1,294,906 persons, including 993,301 siblings in 728,271 families), from 1 year of age until an autism diagnosis (13,547), death, emigration, or December 31, 2012. Autism, with and without attention deficit hyperactivity disorder (ADHD) and with and without intellectual disability (ID) were based on ICD-8 and ICD-10 codes from Danish national health registers, including 3,319 autism + ADHD, 10,228 autism ΓêÆ no ADHD, 2,205 autism + ID, and 11,342 autism ΓêÆ no ID. We estimated hazard ratios (HRs) and 95% confidence intervals (95% CIs) between any maternal smoking (from birth records) and autism (or sub-phenotypes) using survival models with robust standard errors, stratifying by birth year and adjusting for child sex, parity, and parental age, education, income, and psychiatric history. To additionally address confounding using family designs, we constructed a maternal cluster model (adjusting for the smoking proportion within the family), and a stratified sibling model. Associations with maternal smoking and autism were elevated in conventional adjusted analyses (HR of 1.17 [1.13ΓÇô1.22]) but attenuated in the maternal cluster (0.98 [0.88ΓÇô1.09]) and sibling (0.86 [0.64ΓÇô1.15]) models. Similarly, risks of autism sub-phenotypes with maternal smoking were attenuated in the family-based models. Together these results support that smoking in pregnancy is not linked with autism or select autism comorbid sub-phenotypes after accounting for familial confounding. Autism Res 2019. -® 2019 International Society for Autism Research, Wiley Periodicals, Inc. Lay Summary: Smoking during pregnancy has many harmful impacts, which may include harming the baby's developing brain. However, in a study of thousands of families in Denmark, it does not appear that smoking in pregnancy leads to autism or autism in combination with intellectual problems or attention deficits, once you account for the way smoking patterns and developmental disabilities run in families

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Biol Psychiatry. 2019;86:577-86.

ASSOCIATIONS BETWEEN ATTENTION-DEFICIT/HYPERACTIVITY DISORDER AND VARIOUS EATING DISORDERS: A SWEDISH NATIONWIDE POPULATION STUDY USING MULTIPLE GENETICALLY INFORMATIVE APPROACHES.

Yao S, Kuja-Halkola R, Martin J, et al.

Background: Although attention-deficit/hyperactivity disorder (ADHD) and eating disorders (EDs) frequently co-occur, little is known about the shared etiology. In this study, we comprehensively investigated the genetic association between ADHD and various EDs, including anorexia nervosa (AN) and other EDs such as bulimia nervosa.

Methods: We applied different genetically informative designs to register-based information of a Swedish nationwide population (N = 3,550,118). We first examined the familial coaggregation of clinically diagnosed ADHD and EDs across multiple types of relatives. We then applied quantitative genetic modeling in full-sisters and maternal half-sisters to estimate the genetic correlations between ADHD and EDs. We further tested the associations between ADHD polygenic risk scores and ED symptoms, and between AN polygenic risk scores and ADHD symptoms, in a genotyped population-based sample (N = 13,472).

Results: Increased risk of all types of EDs was found in individuals with ADHD (any ED: odds ratio [OR] = 3.97, 95% confidence interval [CI] = 3.81, 4.14; AN: OR = 2.68, 95% CI = 2.15, 2.86; other EDs: OR = 4.66, 95% CI = 4.47, 4.87; bulimia nervosa: OR = 5.01, 95% CI = 4.63, 5.41) and their relatives compared with individuals without ADHD and their relatives. The magnitude of the associations decreased as the degree of relatedness decreased, suggesting shared familial liability between ADHD and EDs. Quantitative genetic models revealed stronger genetic correlation of ADHD with other EDs (.37, 95% CI = .31, .42) than with AN (.14, 95% CI = .05, .22). ADHD polygenic risk scores correlated positively with ED symptom measures overall and with the subscales Drive for Thinness and Body Dissatisfaction despite small effect sizes.

Conclusions: We observed stronger genetic association with ADHD for non-AN EDs than for AN, highlighting specific genetic correlation beyond a general genetic factor across psychiatric disorders

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Biostatistics and Epidemiology. 2019;3:90-108.

A FREQUENTIST MIXTURE MODELING OF STOP SIGNAL REACTION TIMES.

Soltanifar M, Dupuis A, Schachar R, et al.

The stop signal reaction time (SSRT), a measure of the latency of the stop signal process, has been theoretically formulated using a horse race model of go and stop signal processes by the American scientist Gordon Logan (1994). The SSRT assumes equal impact of the preceding trial type (go/stop) on its measurement. In the case of a violation of this assumption, we consider estimation of SSRT based on the idea of earlier analysis of cluster type go reaction times (GORT) and linear mixed model (LMM) data analysis results. Two clusters of trials were considered including those trials preceded by a go trial and other trials preceded by a stop trial. Given disparities between cluster type SSRTs, we need to consider some new indexes considering the unused cluster type information in the calculations. We introduce mixture SSRT and weighted SSRT as two new distinct indexes of SSRT that address the violated assumption. Mixture SSRT and weighted SSRT are theoretically asymptotically equivalent under special conditions. An example of stop single task (SST) real data is presented to show equivalency of these two new SSRT indexes and their larger magnitude compared to Logan's single 1994 SSRT. Abbreviations: ADHD: attention deficit hyperactivity disorder; ExG: Ex-Gaussiandistribution; GORT: reaction time in a go trial; GORTA: reaction time in a type A gotrial; GORTB: reaction time in a type B go trial; LMM: linear mixed model; SWAN:strengths and weakness of ADHD symptoms and normal behavior rating scale; SSD: stop signal delay; SR: signal respond; SRRT: reaction time in a failedstop trial; SSRT: stop signal reaction times in a stop trial; SST: stop signaltask

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BMC Med Genet. 2019 Jun;20:101.

A NOVEL NAA10 P.(R83H) VARIANT WITH IMPAIRED ACETYLTRANSFERASE ACTIVITY IDENTIFIED IN TWO BOYS WITH ID AND MICROCEPHALY.

Ree R, Geithus AS, Torring PM, et al.

BACKGROUND: N-terminal acetylation is a common protein modification in human cells and is catalysed by N-terminal acetyltransferases (NATs), mostly cotranslationally. The NAA10-NAA15 (NatA) protein complex is the major NAT, responsible for acetylating ~ 40% of human proteins. Recently, NAA10 germline variants were found in patients with the X-linked lethal Ogden syndrome, and in other familial or de novo cases with variable degrees of developmental delay, intellectual disability (ID) and cardiac anomalies.

METHODS: Here we report a novel NAA10 (NM_003491.3) c.248G > A, p.(R83H) missense variant in NAA10 which was detected by whole exome sequencing in two unrelated boys with intellectual disability, developmental delay, ADHD like behaviour, very limited speech and cardiac abnormalities. We employ in vitro acetylation assays to functionally test the impact of this variant on NAA10 enzyme activity.

RESULTS: Functional characterization of NAA10-R83H by in vitro acetylation assays revealed a reduced enzymatic activity of monomeric NAA10-R83H. This variant is modelled to have an altered charge density in the acetyl-coenzyme A (Ac-CoA) binding region of NAA10.

CONCLUSIONS: We show that NAA10-R83H has a reduced monomeric catalytic activity, likely due to impaired enzyme-Ac-CoA binding. Our data support a model where reduced NAA10 and/or NatA activity cause the phenotypes observed in the two patients

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BMC Psychiatry. 2018 Nov;18:368.

IS INTRAUTERINE EXPOSURE TO ACETAMINOPHEN ASSOCIATED WITH EMOTIONAL AND HYPERACTIVITY PROBLEMS DURING CHILDHOOD? FINDINGS FROM THE 2004 PELOTAS BIRTH COHORT.

Tovo-Rodrigues L, Schneider BC, Martins-Silva T, et al.

BACKGROUND: Longitudinal studies have consistently reported that prenatal exposure to acetaminophen can to lead to an increased risk of attention deficit-hyperactivity disorder during childhood. This study aimed to investigate the association between intrauterine exposure to acetaminophen and the presence of emotional and behavioral problems at the ages of 6 and 11 years in a low-middle income country.

METHODS: We performed a prospective longitudinal population-based study using data from the 2004 Pelotas birth cohort. From the 4231 initial cohort participants, 3722 and 3566 children were assessed at 6 and 11 years of age, respectively. The outcomes were assessed using the parent version of Strengths and Difficulties Questionnaire (SDQ). The cut-off points established for the Brazilian population were used to categorize the outcomes. Crude and adjusted odds ratio were obtained through logistic regression.

RESULTS: Acetaminophen was used by 27.5% (95% confidence interval [CI]: 26.1-28.9) of the mothers at least once during pregnancy. The prevalence of emotional problems at 6 and 11 years was 13.6 and 19.9%, respectively. For hyperactivity problems, prevalence was 13.9 and 16.1%, respectively. Intrauterine exposure to acetaminophen increased the odds of having emotional (odds ratio [OR] = 1.47; 95% CI: 1.07-2.02) and hyperactivity/inattention (OR = 1.42; 95% CI: 1.06-1.92) problems in 6-year-old boys. At the age of 11, a small decrease in the effect was observed for both outcomes after adjustment: OR = 1.31 (95% CI: 0.99-1.73) for emotional problems and OR = 1.25 (95% CI: 0.95-1.65) for hyperactivity/inattention in boys. No association for any phenotypes at both ages was observed for girls.

CONCLUSION: The effect of intrauterine exposure to acetaminophen in emotional and hyperactivity symptoms was dependent on sex in a Brazilian cohort. While it seemed to be important for boys, mainly at 6 years of age, for girls, no association was observed

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BMJ Open. 2019;9.

ADOLESCENTS' EXPERIENCES OF BEING DIAGNOSED WITH ATTENTION DEFICIT HYPERACTIVITY DISORDER: A PHENOMENOLOGICAL STUDY CONDUCTED IN SWEDEN.

Andersson F, I, Ranjbar V, Danielsson L.

Objectives To explore adolescents' experiences of being diagnosed with Attention deficit hyperactivity disorder (ADHD). Design Qualitative interview study, using a phenomenological framework and analysis.

Setting The children's clinic of a specialised out-care hospital located in a multicultural area of a Swedish city. Participants 13 adolescents, 7 boys and 6 girls between 14 and 19 years old, who had been diagnosed with ADHD.

Results The participants' experience of being diagnosed with ADHD was interpreted as a process of understanding oneself as being different, for better or worse, like many others. The participants sought acceptance and a sense of normality, while developing an understanding of both the positive and the negative sides of their ADHD traits. These two sides of a coin were inter-related parts of themselves and were shared by many others, which increased their acceptance. Three themes described phases of the process: struggling with vulnerability, responding to a label and manoeuvring social life.

Conclusion The results add to previous research, illuminating that the adolescents tried to make sense of both the uniqueness and the vulnerability of the ADHD diagnosis. The findings can be useful for healthcare professionals, in reflecting on the complexity of ADHD and on the adolescents' expectations

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Br J Psychiatry. 2018 Sep;213:555-60.

ATTENTION-DEFICIT HYPERACTIVITY DISORDER AND ANXIETY DISORDERS AS PRECURSORS OF BIPOLAR DISORDER ONSET IN ADULTHOOD.

Meier SM, Pavlova B, Dalsgaard S, et al.

BACKGROUND: Attention-deficit hyperactivity disorder (ADHD) and anxiety disorders have been proposed as precursors of bipolar disorder, but their joint and relative roles in the development of bipolar disorder are unknown.

Aims To test the prospective relationship of ADHD and anxiety with onset of bipolar disorder.

METHOD: We examined the relationship between ADHD, anxiety disorders and bipolar disorder in a birth cohort of 2 409 236 individuals born in Denmark between 1955 and 1991. Individuals were followed from their sixteenth birthday or from January 1995 to their first clinical contact for bipolar disorder or until December 2012. We calculated incidence rates per 10 000 person-years and tested the effects of prior diagnoses on the risk of bipolar disorder in survival models.

RESULTS: Over 37 394 865 person-years follow-up, 9250 onsets of bipolar disorder occurred. The incidence rate of bipolar disorder was 2.17 (95% CI 2.12-2.19) in individuals with no prior diagnosis of ADHD or anxiety, 23.86 (95% CI 19.98-27.75) in individuals with a prior diagnosis of ADHD only, 26.05 (95% CI 24.47-27.62) in individuals with a prior diagnosis of anxiety only and 66.16 (95% CI 44.83-87.47) in those with prior diagnoses of both ADHD and anxiety. The combination of ADHD and anxiety increased the risk of bipolar disorder 30-fold (95% CI 21.66-41.40) compared with those with no prior ADHD or anxiety.

CONCLUSIONS: Early manifestations of both internalising and externalising psychopathology indicate liability to bipolar disorder. The combination of ADHD and anxiety is associated with a very high risk of bipolar disorder.Declaration of interestNone

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Brain Imaging Behav. 2019.

DORSOLATERAL PREFRONTAL CORTEX HYPERACTIVITY DURING INHIBITORY CONTROL IN CHILDREN WITH ADHD IN THE ANTISACCADE TASK.

Fernandez-Ruiz J, Hakvoort Schwerdtfeger RM, Alahyane N, et al.

Children with ADHD show significant deficits in response inhibition. A leading hypothesis suggests prefrontal hypoactivation as a possible cause, though, there is conflicting evidence. We tested the hypoactivation hypothesis by analyzing the response inhibition process within the oculomotor system. Twenty-two children diagnosed with ADHD and twenty control (CTRL) children performed the antisaccade task while undergoing an fMRI study with concurrent eye tracking. This task included a preparatory stage that cued a prosaccade (toward a stimuli) or an antisaccade (away from a stimuli) without an actual presentation of a peripheral target. This allowed testing inhibitory control without the confounding activation from an actual response. The ADHD group showed longer reaction times and more antisaccade direction errors. While both groups showed activations in saccade network areas, the ADHD showed significant hyperactivation in the dorsolateral prefrontal cortex during the preparatory stage. No other areas in the saccade network had significant activation differences between groups. Further ADHD group analysis OFF and ON stimulant medication did not show drug-related activation differences. However, they showed a significant correlation between the difference in OFF/ON preparatory activation in the precuneus, and a decrease in the number of antisaccade errors. These results do not support the hypoactivity hypothesis as an inhibitory control deficit general explanation, but instead suggest less efficiency during the inhibitory period of the antisaccade task in children. Our findings contrast with previous results in ADHD adults showing decreased preparatory antisaccade activity, suggesting a significant age-dependent maturation effect associated to the inhibitory response in the oculomotor system

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Bundesgesundheitsblatt Gesundheitsforschung Gesundheitsschutz. 2019 Oct;62:1205-14.

HEALTH-RELATED QUALITY OF LIFE AND ITS RELATION TO CHRONIC DISEASES AND MENTAL HEALTH PROBLEMS AMONG CHILDREN AND ADOLESCENTS : RESULTS FROM KIGGS WAVE 2.

Baumgarten F, Cohrdes C, Schienkiewitz A, et al.

BACKGROUND: Health-related quality of life (HRQoL) is increasingly established as an indicator for the subjective health of children and adolescents. The aim of this study was to describe the current HRQoL among children and adolescents in Germany aged between 11 and 17 years taking into account common chronic diseases (bronchial asthma, atopic dermatitis, obesity, ADHD) and mental health problems.

METHODS: The analysis is based on information obtained from 6,599 children and adolescents (51.9% girls; 48.1% boys) from KiGGS Wave 2 (2014-2017). HRQoL was measured with the multidimensional KIDSCREEN-27. The chronic diseases and mental health problems under investigation were assessed by several indicators.

RESULTS: Differences in HRQoL could be found as a function of age and gender. The HRQoL among girls was lower at an older age across all dimensions. These age-related differences are less pronounced among boys. The HRQoL of children and adolescents with chronic diseases and mental health problems was lower compared to their healthy peer groups. The comparison of the investigated chronic diseases and mental health problems revealed significant differences. Particularly, HRQoL was lower for children and adolescents with obesity and mental health problems.

DISCUSSION: The distinction of several dimensions of HRQoL allows a comprehensive understanding of age- and gender-related effects and provides a detailed assessment of the impact of chronic diseases and mental health problems. The present findings underline the importance of HRQoL as an indicator for the subjective health of children and adolescents

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Bundesgesundheitsblatt Gesundheitsforschung Gesundheitsschutz. 2019 Oct;62:1263-74.

EFFECTS OF POVERTY FOR HEALTH AND HEALTH BEHAVIOR OF CHILDREN AND ADOLESCENTS : RESULTS FROM KIGGS WAVE 2.

Lampert T, Kuntz B.

INTRODUCTION: Differences in the health status and health behavior of children and adolescents are analyzed, taking the income situation of the family into account.

METHOD: The data is based on the second wave of the German Health Interview and Examination Survey for Children and Adolescents (KiGGS Wave 2, 2014-2017). Health outcomes are the subjective health, chronic health limitations, mental disorders, ADHD, consumption of fresh fruit, consumption of sugary soft drinks, physical activity, sports activity during leisure time, overweight, and obesity. The income situation is recorded using the equivalized household income.

RESULTS: Poor children and adolescents are more likely to have health problems than their peers from the middle- and, especially, the high-income group; their health behavior is less favorable. The biggest relative income-related differences are found in subjective health. With statistical control for parental education and occupational status, income-related differences in health status remain consistent while being significantly reduced for health behavior.

DISCUSSION: The results confirm that low family income has a significant impact on the health of children and adolescents. Partly, this also applies to their health behavior, whereby the observed differences between the income groups can be attributed mainly to parental education and occupational status. This shows once again that children and adolescents growing up in poverty should be a key target group for prevention and health promotion

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Cardiol Young. 2019.

ANXIETY, DEPRESSION, AND BEHAVIOURAL RATING SCALES IN CHILDREN WITH NON-CARDIAC CHEST PAIN.

Kenar A, Örün UA, Yoldaş T, et al.

Introduction: Chest pain is the second most common reason for referral to paediatric cardiologists after benign heart murmurs. Aetiology frequently depends on non-cardiac reasons. In addition, individuals may

experience non-cardiac chest pain which is idiopathic or of unknown origin. The aim of this study is to examine psychological symptoms in children and adolescents with medically unexplained chest pain.
Methods: A total of 76 patients (ages 8-18 years) were included in the study, who were referred to the paediatric cardiology department with the complaint of chest pain but did not have any detected cardiac aetiology or any other organic causes of chest pain. The control group was composed of 51 healthy volunteers. Self-evaluation scales were given to both groups which included Beck Anxiety Inventory and Children's Depression Inventory. Also parents of both groups completed the Conner's Parent Rating Scale for assessment of Attention-deficit/hyperactivity disorder.
Results: Anxiety scores of the non-cardiac chest pain group were significantly higher compared to controls. No significant differences were found between patients and controls in terms of attention-deficit/hyperactivity disorder and depression scores. In patient group, patterns were similar for boys and girls and for children and adolescents; except girls scored significantly higher than boys in children's depression inventory.
Conclusions: In children and adolescents, non-cardiac chest pain is associated with increased levels of anxiety. These results show the importance of psychiatric evaluation in non-cardiac chest pain patients. Larger controlled studies are needed to determine the prevalence and impact of attention-deficit/hyperactivity disorder and depression in children and adolescents with non-cardiac chest pain

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Cephalalgia. 2019;39:97-98.
PEDIATRIC TENSION-TYPE HEADACHE: THE ROLE OF CO-MORBIDITY WITH EMOTIONAL AND BEHAVIORAL DISORDERS.
Nesterovskiy Y, Zavadenko N, Shipilova E.
Objective: To assess in children and adolescents suffering from frequent episodic or chronic tension-type headaches (TTH) the incidence of co-morbid emotional and behavioral disorders and the patients' daily difficulties in emotions, concentration, behavior, or being able to get along with others.
Methods: 150 patients with TTH (75 male and 75 female) aged 8-16 years were included into the study. The severity of emotional and behavioral problems was analyzed in comparison with their healthy peers (103 boys, 117 girls) by means of parents' interviewing with the Strengths and Difficulties Questionnaire (SDQ) [Goodman R., 2001]. The 25 SDQ items are divided into 5 scales of 5 items: the Hyperactivity-Inattention scale, the Emotional symptoms scale, the Conduct problems scale, the Peer problems scale and the Prosocial Behaviour scale.
Results: Total difficulties scores measured by SDQ were significantly higher in boys (16,2-¦0,7) and girls (14,3-¦0,7) with TTH compared with their peers (respectively 7,9-¦0,4 and 7,7-¦0,4, p<0,001). Patients with TTH had significantly more prominent manifestations than their peers (p<0,001) on the four SDQ scales, including Hyperactivity and Inattention, Conduct problems, Emotional symptoms, Peer problems. However, they did not differ from the peers on Prosocial Behaviour scores. Clinical assessment revealed the following disorders in many patients with pediatric TTH: attention deficit hyperactivity disorder - ADHD (in 45,3% boys and 13,3% girls), oppositional defiant disorder - ODD (26,7% boys, 18,7% girls), with co-occurrence of ADHD and ODD in some (17,3% boys, 10,7% girls). Moreover, most patients with TTH had anxiety disorders (68,0% boys, 77,3% girls) and some adolescents had dysthymic disorder (4,0% boys, 2,7% girls) (Fig.1).
Conclusion: Pediatric TTH clinical manifestations may be dependent on the co-morbid emotional and behavioral disorders. Co-morbid disorders must be taken into account for individualized treatment program including drug therapy and non-pharmacological approaches in TTH. (Figure Preseted)

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Cereb Cortex. 2019;29:1866-74.
VENTROMEDIAL PREFRONTAL VOLUME IN ADOLESCENCE PREDICTS HYPERACTIVE/INATTENTIVE SYMPTOMS IN ADULTHOOD.
Albaugh MD, Ivanova M, Chaarani B, et al.
Youths with attention-deficit/hyperactivity disorder symptomatology often exhibit residual inattention and/or hyperactivity in adulthood; however, this is not true for all individuals. We recently reported that dimensional, multi-informant ratings of hyperactive/inattentive symptoms are associated with ventromedial prefrontal cortex (vmPFC) structure. Herein, we investigate the degree to which vmPFC structure during adolescence

predicts hyperactive/inattentive symptomatology at 5-year follow-up. Structural equation modeling was used to test the extent to which adolescent vmPFC volume predicts hyperactive/inattentive symptomatology 5 years later in early adulthood. 1104 participants (M = 14.52 years, standard deviation = 0.42; 583 females) possessed hyperactive/inattentive symptom data at 5-year follow-up, as well as quality controlled neuroimaging data and complete psychometric data at baseline. Self-reports of hyperactive/inattentive symptomatology were obtained during adolescence and at 5-year follow-up using the Strengths and Difficulties Questionnaire (SDQ). At baseline and 5-year follow-up, a hyperactive/inattentive latent variable was derived from items on the SDQ. Baseline vmPFC volume predicted adult hyperactive/inattentive symptomatology (standardized coefficient = -0.274, P < 0.001) while controlling for baseline hyperactive/inattentive symptomatology. These results are the first to reveal relations between adolescent brain structure and adult hyperactive/inattentive symptomatology, and suggest that early structural development of the vmPFC may be consequential for the subsequent expression of hyperactive/inattentive symptoms

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Child Abuse Negl. 2019;98.

CHILD MALTREATMENT AND ATTENTIONAL PROBLEMS: A LONGITUDINAL BIRTH COHORT STUDY.

Boyd M, Kisely S, Najman J, et al.

Objective: To examine whether child maltreatment is associated with attentional problems in adolescence (14 years) and young adulthood (21 years), and whether outcomes depend on the type of maltreatment (sexual vs non-sexual).

Methods: Data from a population based cohort study involving 3778 mother-child pairs were linked with data from the state child protection agency to examine associations between child abuse and neglect and attention problems, measured using the Achenbach Child Behaviour Checklist (CBCL) and the Achenbach Young Adult Self Report (YASR).

Results: 245 (6.5%) participants had been the subject of notification for non-sexual maltreatment (one or more of neglect, emotional or physical abuse) compared with only 54 (1.4%) who had been subject of notification for suspected sexual abuse. After adjusting for potential confounding variables including maternal, participant and sociodemographic factors, we found those exposed to non sexual maltreatment were likely to experience attentional problems at 14 years ($p < .001$) and 21 years of age ($p = .044$), compared with those participants who had not experienced non sexual maltreatment. By contrast, at age 14 years, sexual abuse was associated with attentional problems only as reported by the participant, not their carer. Results at 21 years of age for those exposed to sexual child maltreatment ($p=.655$) were again in contrast to the observed association between attentional problems and non sexual child maltreatment ($p = .035$).

Conclusion: In this study, non-sexual maltreatment in childhood is associated with attentional problems at both 14 years and 21 years of age. These findings highlight the need for targeted research to better understand the longer term mental health outcomes for children exposed to non-sexual maltreatment. Potential implications for mental health services include the need for broader screening at presentation and importantly, greater collaboration with schools, general practitioners and paediatricians, given the greatest impact would arguably be within these settings

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Child Obes. 2018 Oct;14:477-83.

PROVIDER OBSERVATIONS OF YOUTH WITH EARLY ONSET SEVERE OBESITY IN TERTIARY CARE OBESITY PROGRAMS.

Gaffka BJ, Hassink SG, Santos M, et al.

BACKGROUND: Over 2% of children between the ages of 2 and 5 have severe obesity; however, little is known about the characteristics of this population to guide healthcare professionals in providing care. An initial step is to examine observations of practitioners who manage children with severe early onset obesity in the clinical setting.

METHODS: A total of 72 interdisciplinary healthcare providers with experience providing obesity treatment to children under age 5 with severe obesity completed a semistructured online questionnaire. Participants

responded to 10 open-ended questions about provider observations on several topics, including nutrition, eating behavior, activity, family structure and history, medical history, psychological conditions, and household routines. Data analysis was conducted using grounded theory methods. Emerging themes and subthemes were analyzed based on topics and provider discipline (e.g., medical, nursing, and psychology).
RESULTS: The most commonly observed and reported characteristic of young children with severe obesity was a parent-described dysfunctional approach to food, including frequent complaints about hunger, food seeking, and lack of satiety. Other characteristics included the presence of externalizing behaviors in the child such as temper tantrums and ADHD, developmental delays, medical comorbidities (e.g., asthma and sleep apnea), and unstructured home environments.
CONCLUSIONS: Drawing on the experience of an interdisciplinary group of healthcare providers, this is the first study to describe provider observations of the young child with severe early onset obesity. If validated, these observations can serve to illuminate areas for further education and inform potential clinical subtyping, providing an opportunity to identify target areas for intervention

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Clin Pharmacol Ther. 2018 Oct;104:610-12.
GETTING TO LONG-TERM EFFECTIVENESS AND SAFETY OF ATTENTION-DEFICIT HYPERACTIVITY DISORDER MEDICATIONS.
Beau-Lejdstrom R, Zito JM.
Attention-deficit hyperactivity disorder (ADHD) medication use has dramatically increased in youth worldwide. Recent prevalence data in some European countries show expanded use with one country now matching US usage. Still, substantial geographic differences by country remain regarding the extent to which children receive ADHD medications. These geographic differences by country raise research questions about which country's prevalence data represents appropriate medication use. We urgently need country level studies to contribute to our understanding of an appropriate prevalence of ADHD medication use

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Clin Pharmacol Ther. 2018 Oct;104:619-37.
USING ADHD MEDICATIONS TO TREAT COEXISTING ADHD AND READING DISORDERS: A SYSTEMATIC REVIEW.
Froehlich TE, Fogler J, Barbaresi WJ, et al.
Attention-deficit/hyperactivity disorder (ADHD), the most common pediatric neurobehavioral disorder, frequently presents with coexisting reading disorders (RDs). Despite this, it is unclear whether medication improves symptoms and function in children with comorbid ADHD and RD. We present a systematic review of studies investigating the effects of ADHD medications on ADHD symptoms, academic outcomes, and neuropsychological measures in this important group

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Clin Case Stud. 2019.
COMPARISON OF FUNCTION-BASED, NONFUNCTION-BASED, AND COMBINED TREATMENTS FOR ESCAPE-MAINTAINED AGGRESSION IN A CHILD WITH ATTENTION DEFICIT HYPERACTIVITY DISORDER: A CASE STUDY.
Wilder DA, Bevacqua JA, Hodges AC, et al.
In applied behavior analysis, the use of function-based treatments to reduce problem behavior is well-supported. However, in some cases, function-based treatments alone may not be as effective as nonfunction-based treatments or function-based treatments with additional, nonfunction-based components. In this case study, we compared the delivery of preferred edible items (a nonfunction-based treatment), a break from a task (a function-based treatment), and an enhanced break, which consisted of a break plus access to a preferred tangible item (combination of a nonfunction-based and function-based treatment), to treat escape-maintained aggression exhibited by a young child with attention deficit hyperactivity disorder. Across all three treatments, reinforcement (i.e., edible, break, or enhanced break) was delivered contingent upon compliance with instructions and problem behavior resulted in escape. The nonfunction-based treatment and the combination treatment reduced aggression to zero levels; the function-based treatment did not. Finally, we

allowed the participant to choose which of the three treatments he preferred to experience; he selected the combination treatment most often

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Clin Neurophysiol. 2019;130:e180-e181.

BEST ABSTRACT AWARD RUNNER-UP. PREDICTING CHILDREN WITH ADHD USING PREFRONTAL CORTEX ACTIVITY.

Yasumura A, Omori M, Fukuda A, et al.

Background: Many studies have supported the notion that executive function impairments explain the core symptoms of attention deficit hyperactivity disorder (ADHD). Their neural basis is generally accepted to be in the prefrontal cortex. Thus, methods to quantify brain functions may ultimately assist both in the differential diagnosis of ADHD and in assessing novel interventions. To establish valid, objective biomarkers for ADHD using machine learning for brain function is necessary.

Methods: Machine learning was used to predict disorder severity from new brain function data, using a support vector machine (SVM). A multicenter approach was used to collect data for machine learning training, including behavioral and physiological indicators, age, and reverse Stroop task (RST) data from 108 children with ADHD and 108 typically developing (TD) children. Near-infrared spectroscopy (NIRS) was used to quantify the change in prefrontal cortex oxygenated hemoglobin during RST. Verification data were also collected from 62 children with ADHD and 37 TD children from six facilities in Japan.

Results: The SVM general performance results showed sensitivity of 88.71%, specificity of 83.78%, and an overall discrimination rate of 86.25%.

Conclusions: A SVM using an objective index from RST may be useful as an auxiliary biomarker for diagnosis for children with ADHD

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Clin Neurophysiol. 2019;130:e217.

P2-05-05. INHIBITION FUNCTION AS BIOMARKER IN PATIENTS WITH ADHD: SIMULTANEOUS STUDY OF FNIRS AND ERP IN GO/NOGO TASK.

Kaga Y, Ueda R, Tanaka M, et al.

Background: Children with attention deficit hyperactivity disorder (ADHD) often exhibit deficit in executive function. In general, ADHD is diagnosed behaviorally because objective biomarker for ADHD is undetermined. It is well known that event-related potentials (ERPs) in Go/NoGo task could reflect inhibitory function and functional near-infrared spectroscopy (fNIRS) also is useful for estimation of inhibition function. However, it is unknown which is more useful. We aimed to clarify their disinhibition by simultaneous measurement of oxygenated hemoglobin concentration [OxyHb] through fNIRS and ERPs during Go/NoGo task in children with/without ADHD.

Methods: Subjects were 23 ADHD patients and 20 typically developing children (TDC) (7-9y: young group, 10-14y: elder group). ERPs were recorded at Fz, Cz, Pz (10ΓÇô20 method) and [OxyHb] was recorded at forehead during visual continuous performance task, which appeared five colored patches on LCD monitor in succession.

Results: In younger ADHD, the rate of NoGo/Go-P3 amplitude was significantly decreased than TDC. In elder ADHD, [OxyHb] was significantly decreased at right frontal region. However, these were not significant vice versa.

Conclusion: These data suggest that hemodynamic and electrophysiological findings during Go/NoGo task was different accuracy for biomarker of executive function, therefore, it is important to combine different assessment

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Clin Psychopharmacol Neurosci. 2019;17:446-49.

METHYLPHENIDATE AND CENTRAL PRECOCIOUS PUBERTY: A PROBABLE SIDE EFFECT AMONG SEVEN CHILDREN WITH THE ATTENTION DEFICIT HYPERACTIVITY DISORDER.

Ergür AT, Gül H, Gül A.

Methylphenidate (MPH) is the most preferred drug for treatment of the attention deficit hyperactivity disorder (ADHD). Here, we aimed to discuss the possible effects and mechanisms of MPH on precocious puberty (PP) via a case series with seven children who had normal body mass index. In this case series we evaluated seven children with ADHD, who had received MPH for at least 6 months (0.5 mg/kg/dose three times a day, maximum 60 mg) and admitted to Department of Pediatric Endocrinology with PP symptoms. The mean age was 8.16 years. Basal hormonal levels (luteinizing hormone [LH], follicle stimulating hormone, and estrogen/testosterone) were within normal range. Results of LH-releasing hormone stimulation tests demonstrated central pubertal responses. Glutamine, dopamine and noradrenaline are most important excitatory neurotransmitters that have a role at the beginning of puberty. The effect of MPH, cumulating dopamine and noradrenaline in the synaptic gap could be associated with the acceleration of puberty with the excitatory effect of dopamine's gonadotropin-releasing hormone (GnRH) release, excitatory effect of noradrenaline's GnRH release and the disappearance of GnRH receptor expression suppressor effect on prolactin disinhibitory effect

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Cochrane Database Syst Rev. 2019 Jun;6:CD008223.

SOCIAL SKILLS TRAINING FOR ATTENTION DEFICIT HYPERACTIVITY DISORDER (ADHD) IN CHILDREN AGED 5 TO 18 YEARS.

Storebo OJ, Elmose AM, Skoog M, et al.

BACKGROUND: Attention deficit hyperactivity disorder (ADHD) in children is associated with hyperactivity and impulsivity, attention problems, and difficulties with social interactions. Pharmacological treatment may alleviate the symptoms of ADHD but this rarely solves difficulties with social interactions. Children with ADHD may benefit from interventions designed to improve their social skills. We examined the benefits and harms of social skills training on social skills, emotional competencies, general behaviour, ADHD symptoms, performance in school of children with ADHD, and adverse events.

OBJECTIVES: To assess the beneficial and harmful effects of social skills training in children and adolescents with ADHD.

SEARCH METHODS: In July 2018, we searched CENTRAL, MEDLINE, Embase, PsycINFO, 4 other databases and two trials registers.We also searched online conference abstracts, and contacted experts in the field for information about unpublished or ongoing randomised clinical trials. We did not limit our searches by language, year of publication, or type or status of publication, and we sought translation of the relevant sections of non-English language articles.

SELECTION CRITERIA: Randomised clinical trials investigating social skills training versus either no intervention or waiting-list control, with or without pharmacological treatment of both comparison groups of children and adolescents with ADHD.

DATA COLLECTION AND ANALYSIS: We conducted the review in accordance with the Cochrane Handbook for Systematic Reviews of Intervention. We performed the analyses using Review Manager 5 software and Trial Sequential Analysis. We assessed bias according to domains for systematic errors. We assessed the certainty of the evidence with the GRADE approach.

MAIN RESULTS: We included 25 randomised clinical trials described in 45 reports. The trials included a total of 2690 participants aged between five and 17 years. In 17 trials, participants were also diagnosed with various comorbidities.The social skills interventions were described as: 1) social skills training, 2) cognitive behavioural therapy, 3) multimodal behavioural/psychosocial therapy, 4) child life and attention skills treatment, 5) life skills training, 6) the "challenging horizon programme", 7) verbal self-instruction, 8) meta-cognitive training, 9) behavioural therapy, 10) behavioural and social skills treatment, and 11) psychosocial treatment. The control interventions were no intervention or waiting list.The duration of the interventions ranged from five weeks to two years. We considered the content of the social skills interventions to be comparable and based on a cognitive-behavioural model. Most of the trials compared child social skills training or parent training combined with medication versus medication alone. Some of the experimental

interventions also included teacher consultations.More than half of the trials were at high risk of bias for generation of the allocation sequence and allocation concealment. No trial reported on blinding of participants and personnel. Most of the trials did not report on differences between groups in medication for comorbid disorders. We used all eligible trials in the meta-analyses, but downgraded the certainty of the evidence to low or very low.We found no clinically relevant treatment effect of social skills interventions on the primary outcome measures: teacher-rated social skills at end of treatment (standardised mean difference (SMD) 0.11, 95% confidence interval (CI) 0.00 to 0.22; 11 trials, 1271 participants; I(2) = 0%; P = 0.05); teacher-rated emotional competencies at end of treatment (SMD -0.02, 95% CI -0.72 to 0.68; two trials, 129 participants; I(2) = 74%; P = 0.96); or on teacher-rated general behaviour (SMD -0.06 (negative value better), 95% CI -0.19 to 0.06; eight trials, 1002 participants; I(2) = 0%; P = 0.33). The effect on the primary outcome, teacher-rated social skills at end of treatment, corresponds to a MD of 1.22 points on the social skills rating system (SSRS) scale (95% CI 0.09 to 2.36). The minimal clinical relevant difference (10%) on the SSRS is 10.0 points (range 0 to 102 points on SSRS).We found evidence in favour of social skills training on teacher-rated core ADHD symptoms at end of treatment for all eligible trials (SMD -0.26, 95% CI -0.47 to -0.05; 14 trials, 1379 participants; I(2)= 69%; P = 0.02), but the finding is questionable due to lack of support from sensitivity analyses, high risk of bias, lack of clinical significance, high heterogeneity, and low certainty.The studies did not report any serious or non-serious adverse events.
AUTHORS' CONCLUSIONS: The review suggests that there is little evidence to support or refute social skills training for children and adolescents with ADHD. We may need more trials that are at low risk of bias and a sufficient number of participants to determine the efficacy of social skills training versus no training for ADHD. The evidence base regarding adolescents is especially weak

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Curr Psychiatry Rep. 2018 Sep;20:100.
ATTENTION-DEFICIT/HYPERACTIVITY DISORDER AND TRANSITIONAL AGED YOUTH.
Wilens TE, Isenberg BM, Kaminski TA, et al.
PURPOSE OF REVIEW: Extensive research has been conducted on attention-deficit/hyperactivity disorder (ADHD) in children and adults; however, less is known about ADHD during the transition from childhood to adulthood. Transitional aged youth (TAY) with ADHD represents a particularly vulnerable population as their newfound independence and responsibility often coincides with the development of comorbid disorders. The purpose of this review is to provide an update on the evaluation, diagnosis, and treatment of TAY-ADHD.
RECENT FINDINGS: Recent studies discovering ADHD symptoms emerging in TAY call the classification of ADHD as a disorder necessarily developing in childhood into question. TAY-ADHD are also shown to be vulnerable to academic and social impairments, increased risky behavior, and comorbid psychiatric disorders. Due to the risk of stimulant diversion in TAY, providers are advised to take precaution when prescribing medication to this population. Recent studies demonstrating the efficacy of psychotherapy in conjunction with non-stimulant or extended release stimulant medication provide a feasible alternative. This review highlights research on the course and evaluation of ADHD, impairments and comorbidities specific to TAY, and treatments tailored to address the unique challenges associated with TAY-ADHD

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Curr Opin Pediatr. 2019;31:166-74.
NEW STIMULANT FORMULATIONS FOR PEDIATRIC ATTENTION-DEFICIT/HYPERACTIVITY DISORDER: A CASE-BASED APPROACH FOR THE PRIMARY CARE PROVIDER.
Partain PI, White J, Hammerness P.
Purpose of review To provide an up-to-date clinical review of U.S. Food and Drug Administration (FDA)-approved stimulant medications for attention-deficit/hyperactivity disorder (ADHD), including a framework for individualized treatment by primary care pediatric providers.
Recent findings Stimulant medications are first-line agents for pediatric ADHD. Since 2012, 11 novel stimulant medications have been approved by the FDA for the treatment of ADHD. Because of an expanded formulary of available methylphenidate-based and amphetamine-based stimulants, primary care providers may be unfamiliar with some novel medications outside a select formulary.

Summary The current broad formulary of methylphenidate-based and amphetamine-based stimulants provides primary care clinicians with a greater opportunity for personalized medicine within the patient-centered medical home. Through a systematic review of prior relevant medication trials, a consideration of daily symptom burden and thoughtful pragmatics, primary care providers can offer a more precise, customized stimulant treatment

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Dev Sci. 2018 Sep;21:e12630.

GENETIC AND ENVIRONMENTAL LINKS BETWEEN MOTOR ACTIVITY LEVEL AND ATTENTION PROBLEMS IN EARLY CHILDHOOD.

Saudino KJ, Wang M, Flom M, et al.

Cross-lagged biometric models were used to examine genetic and environmental links between actigraph-assessed motor activity level (AL) and parent-rated attention problems (AP) in 314 same-sex twin pairs (MZ = 145, DZ = 169) at ages 2 and 3 years. At both ages, genetic correlations between AL and AP were moderate (ra2 = .35; ra3 = .39) indicating both overlap and specificity in genetic effects across the two domains. Within- and across-age phenotypic associations between AL and AP were entirely due to overlapping genetic influences. There was a unidirectional effect of AL at age 2 predicting later AP. For AP, genetic and environmental influences from age 2 were transmitted to age 3 via stability effects and from AL. For AL, across-age effects were transmitted only via stability. These results suggest that overactivity in late infancy may impact the later development of problems related to inattention, and that genetic factors explain the association between the two domains

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Dev Sci. 2018 Sep;21:e12661.

VISUAL SEARCH AND AUTISM SYMPTOMS: WHAT YOUNG CHILDREN SEARCH FOR AND CO-OCCURRING ADHD MATTER.

Doherty BR, Charman T, Johnson MH, et al.

Superior visual search is one of the most common findings in the autism spectrum disorder (ASD) literature. Here, we ascertain how generalizable these findings are across task and participant characteristics, in light of recent replication failures. We tested 106 3-year-old children at familial risk for ASD, a sample that presents high ASD and ADHD symptoms, and 25 control participants, in three multi-target search conditions: easy exemplar search (look for cats amongst artefacts), difficult exemplar search (look for dogs amongst chairs/tables perceptually similar to dogs), and categorical search (look for animals amongst artefacts). Performance was related to dimensional measures of ASD and ADHD, in agreement with current research domain criteria (RDoC). We found that ASD symptom severity did not associate with enhanced performance in search, but did associate with poorer categorical search in particular, consistent with literature describing impairments in categorical knowledge in ASD. Furthermore, ASD and ADHD symptoms were both associated with more disorganized search paths across all conditions. Thus, ASD traits do not always convey an advantage in visual search; on the contrary, ASD traits may be associated with difficulties in search depending upon the nature of the stimuli (e.g., exemplar vs. categorical search) and the presence of co-occurring symptoms

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Drug Metabolism and Pharmacokinetics. 2019.

POPULATION PHARMACOKINETIC AND EXPOSURE-RESPONSE ANALYSES OF GUANFACINE IN JAPANESE PEDIATRIC ADHD PATIENTS.

Tsuda Y, Matsuo Y, Matsumoto S, et al.

Guanfacine hydrochloride extended-release tablet (GXR) is approved for child and adolescent patients with attention-deficit/hyperactivity disorder (ADHD). The aims of this study were to develop a population pharmacokinetic model of guanfacine after administration of GXR and to evaluate factors influencing the pharmacokinetics of guanfacine in pediatric ADHD patients. A population pharmacokinetic analysis was

performed using 3231 plasma concentration data items of guanfacine for pediatric ADHD patients aged 6ΓÇô17 years obtained from clinical studies in Japan and the US. In addition, the relationship of the ADHD Rating Scale IV (ADHD RS-IV, efficacy endpoint) total score with exposure to guanfacine was assessed for Japanese pediatric ADHD patients. A one-compartment model with first-order absorption and lag time well described the plasma concentration data of guanfacine in pediatric ADHD patients. Body weight was selected as a covariate of apparent total body clearance and apparent volume of distribution. There was no pharmacokinetic difference between Japanese and non-Japanese pediatric ADHD patients. The results suggested a tendency of exposure-dependent reduction in the ADHD RS-IV total score, whereas the reduction was observed even at low plasma exposure levels compared with the placebo group

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Encephale. 2019.

IMPULSIVITY AND OBESITY IN CHILDREN WITH ATTENTION DEFICIT HYPERACTIVITY DISORDER: A CLINICAL, NEUROPSYCHOLOGICAL AND MAGNETIC RESONANCE SPECTROSCOPY EXPLORATORY STUDY.

Ben AL, Lachal J.

OBJECTIVES: Relationship between Attention Deficit Hyperactivity Disorder (ADHD) and obesity in adults and children had previously been established in research studies. Brain imaging studies pointed out the important role of the prefrontal region in both ADHD and obesity. However, the underlying link between ADHD and obesity is not well understood. The hypothesis that impulsivity could play a role has been explored in clinical studies of ADHD and Binge Eating Disorders or Loss of Control Eating, with contradictory results. Our study aims to compare children with ADHD and obesity to children with ADHD and normal weight. We propose to compare these two populations with clinical, neuropsychological and brain spectroscopy investigation, focusing specifically on impulsivity items.

METHOD: Ten children presenting overweight or obesity were selected from a larger population of children with ADHD (5-12y) and paired with regard to gender and age with ten children with ADHD and normal weight from the same population. Conners Rating scales version parents (CPRS) and teachers (CTRS), Conners' Continuous Performance Test II (CPT-II), and Magnetic Resonance Spectroscopy (MRS) metabolites in five regions of interest (left and right prefrontal, left and right striatal and left cerebellum regions) were measured for all the children. For MRS, ratio to creatinine levels of following metabolites were measured: glycerophosphocholine+phosphocholine/creatinine (GPC+PCh/Cr), glutamate+glutamine (Glu+Gln/Cr), myoinositol (mI/Cr) et N-acétylaspartate+N-acétylaspartylglutamate (NAA+NAAG/Cr).

RESULTS: Hyperactivity/Impusivity and Conners Global Index (CGI) subscales of Conners rating scales showed a higher rate of impulsivity in children with ADHD and obesity as compared to children with ADHD and normal weight. Neuropsychological results were comparable in the two groups. Finally, MRS showed a higher GPC+PCh/Cr ratio in right prefrontal cortex in children with ADHD and obesity as compared to children with ADHD and normal weight.

CONCLUSIONS: Our results are concordant with the hypothesis that impulsivity could be the link between obesity and ADHD in a population of children with ADHD. The right prefrontal regions seem to be areas of interests that need more research in the study of the link between obesity and ADHD

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Eur Child Adolesc Psychiatry. 2019.

PREDICTIVE UTILITY OF AUTISTIC TRAITS IN YOUTH WITH ADHD: A-ÁCONTROLLED 10-YEAR LONGITUDINAL FOLLOW-UP STUDY.

Joshi G, DiSalvo M, Faraone SV, et al.

The objective of this study was to investigate the stability and predictive utility of autistic traits (ATs) in youth with attention-deficit/hyperactivity disorder (ADHD). Participants were referred youth with and without ADHD, without a diagnosis of autism spectrum disorder, and their siblings, derived from identically designed longitudinal caseΓÇôcontrol family studies of boys and girls with ADHD. Subjects were assessed with structured diagnostic interviews and measures of social, cognitive, and educational functioning. The presence of ATs at baseline was operationalized using a unique profile of the Child Behavior Checklist (CBCL) consisting of an aggregate T score of ΓëÑ 195 on the Withdrawn, Social, and Thought Problems

subscales (CBCL-AT profile). At the follow-up, 83% of the ADHD youth with a positive AT profile at baseline continued to have a positive CBCL-AT profile. The presence of a positive CBCL-AT profile at baseline in youth with ADHD heralded a more compromised course characterized by a greater burden of psychopathology that emerged at an earlier age, along with poorer interpersonal, educational, and neurocognitive outcomes. Findings indicate a high level of persisting ATs in ADHD youth over time, as indexed through the CBCL-AT profile, and the presence of this profile prognosticates a compromised course in adult life in multiple domains of functioning

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Eur Child Adolesc Psychiatry. 2019.

REVISITING PARENT-CHILD INTERACTIONS IN EARLY CHILDHOOD AS RELEVANT FACTOR IN THE DEVELOPMENT OF ADHD.

Havinga PJ, Hartman CA, Visser JC, et al.

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Eur J Epidemiol. 2019.

BIAS FROM SELF SELECTION AND LOSS TO FOLLOW-UP IN PROSPECTIVE COHORT STUDIES.

Biele G, Gustavson K, Czajkowski NO, et al.

Self-selection into prospective cohort studies and loss to follow-up can cause biased exposure-outcome association estimates. Previous investigations illustrated that such biases can be small in large prospective cohort studies. The structural approach to selection bias shows that general statements about bias are not possible for studies that investigate multiple exposures and outcomes, and that inverse probability of participation weighting (IPPW) but not adjustment for participation predictors generally reduces bias from self-selection and loss to follow-up. We propose to substantiate assumptions in structural models of selection bias through calculation of genetic correlations coefficients between participation predictors, outcome, and exposure, and to estimate a lower bound for bias due to self-selection and loss to follow-up by comparing effect estimates from IPP weighted and unweighted analyses. This study used data from the Norwegian Mother and Child Cohort Study and the Medical Birth Registry of Norway. Using the example of risk factors for ADHD, we find that genetic correlations between participation predictors, exposures, and outcome suggest the presence of bias. The comparison of exposure-outcome associations from regressions with and without IPPW revealed meaningful deviations. Assessment of selection bias for entire multi-exposure multi-outcome cohort studies is not possible. Instead, it has to be assessed and controlled on a case-by-case basis

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Eur Psychiatry. 2019;62:68-73.

ASSOCIATION BETWEEN CIRCULATING ZINC/FERRITIN LEVELS AND PARENT CONNER'S SCORES IN CHILDREN WITH ATTENTION DEFICIT HYPERACTIVITY DISORDER.

El-Baz FM, Youssef AM, khairy E, et al.

ADHD is one of the most common neurobehavioral disorders among children and adolescents. In this prospective study, we aimed to measure circulating zinc and ferritin levels in children with ADHD, pick up the deficient ones to give zinc and iron supplements then compare before and after treatment according to their Conner's scores and Wecsler IQ test. Current study included fifty children diagnosed as having ADHD by DSMV criteria, their zinc and ferritin levels were measured by Colorimetric method and enzyme-linked immunosorbent assay (ELISA) respectively. They were divided into: group I (zinc only deficient), group II (zinc and ferritin deficient),group III (non-deficient), cases with mineral deficiency received zinc (55 mg/day) and/or iron (6 mg/kg/day) for 6 months then reassessed by parent Conner's rating scale. In group 1, there was no significant difference between the Wecsler verbal and non-verbal IQ scores and oppositional and cognitive problems in Conner's scores before and after zinc supplements, although there was significant improvement in attention, hyperactivity, emotional liability and impulsivity. In group II, there was significant improvement in verbal and total IQ but not in performance IQ, also there was significant improvement in hyperactivity, emotional liability and impulsivity with no significant difference in oppositional, cognitive

problems and inattention before and after zinc/ iron supplements. In Conclusion, Zinc supplements in adjuvant to the main treatment significantly improved symptoms of ADHD children. However, a combined zinc and iron supplements was superior to zinc alone in alleviating ADHD symptoms as well as IQ improvement

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Evid Based Ment Health. 2018 Nov;21:173-76.

TWENTY YEARS OF RESEARCH ON ATTENTION-DEFICIT/HYPERACTIVITY DISORDER (ADHD): LOOKING BACK, LOOKING FORWARD.

Cortese S, Coghill D.

In this clinical review we summarise what in our view have been some the most important advances in the past two decades, in terms of diagnostic definition, epidemiology, genetics and environmental causes, neuroimaging/cognition and treatment of attention-deficit/hyperactivity disorder (ADHD), including: (1) the most recent changes to the diagnostic criteria in the Diagnostic and Statistical Manual of Mental Disorders and International Classification of Diseases; (2) meta-analytic evidence showing that, after accounting for diagnostic methods, the rates of ADHD are fairly consistent across Western countries; (3) the recent finding of the first genome-wide significant risk loci for ADHD; (4) the paradigm shift in the pathophysiological conceptualisation of ADHD from alterations in individual brain regions to a complex dysfunction in brain networks; (5) evidence supporting the short-term efficacy of ADHD pharmacological treatments, with a different profile of efficacy and tolerability in children/adolescents versus adults; (6) a series of meta-analyses showing that, while non-pharmacological treatment may not be effective to target ADHD core symptoms, some of them effectively address ADHD-related impairments (such as oppositional behaviours for parent training and working memory deficits for cognitive training). We also discuss key priorities for future research in each of these areas of investigation. Overall, while many research questions have been answered, many others need to be addressed. Strengthening multidisciplinary collaborations, relying on large data sets in the spirit of Open Science and supporting research in less advantaged countries will be key to face the challenges ahead

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Evid Based Ment Health. 2018 Nov;21:155-64.

CONCEPTUAL REVIEW OF MEASURING FUNCTIONAL IMPAIRMENT: FINDINGS FROM THE WEISS FUNCTIONAL IMPAIRMENT RATING SCALE.

Weiss MD, McBride NM, Craig S, et al.

OBJECTIVE: This is a narrative review of validation and outcome studies using the Weiss Functional Impairment Rating Scale (WFIRS). The objective of the review is to establish a framework for understanding functional impairment and create a definition for functional response and remission.

METHODS: We conducted a literature search via MEDLINE, EBSCO and Google Scholar with no date restrictions and reviewed bibliographies of selected publications. Publications found in languages other than English were translated and clarification obtained from the author(s) if needed. Inclusion criteria were any manuscript that was either a WFIRS psychometric validation study or a clinical trial using the WFIRS as an outcome. There were no exclusion criteria.

RESULTS: The WFIRS has been validated in multiple cultures, and in clinical, research and control populations. The WFIRS has robust psychometric properties across ages, psychiatric status and informants. Outcome studies show variable improvement, with different response patterns between domains and among different interventions.

CONCLUSION: Symptom improvement and remission needs to be complemented with evaluation of functional improvement and remission to obtain a full picture of clinical status over the course of treatment

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Gac Med Mex. 2018;154:657-64.

COMPARACION DE SINTOMAS DE HIPERACTIVIDAD E INATENCION EN ADOLESCENTES CON Y SIN ANTECEDENTES DE EMBARAZO.

Aldrete-Cortez V, Tafoya SA, Meillon F, et al.

Introduction: Teenage pregnancy has a negative impact both on mother's health and on her offspring quality life and development. In spite of its important social relevance, behavioral factors that can favor its occurrence have not been extensively explored.
Objective: To compare symptoms of inattention and hyperactivity between adolescents with and without a history of pregnancy.
Method: A sociodemographic record and the attention deficit hyperactivity disorder questionnaire (ADD) of the Neuropsi instrument were applied to 60 adolescents: 30 cases and 30 controls. The ADD was answered by the adolescents themselves, as well as by a close relative (parent or spouse) or by one of their teachers.
Results: From the perspective of others (parents and teachers), adolescents with a history of pregnancy showed more symptoms of attention deficit and higher attention deficit and hyperactivity overall score (both p </= 0.01). In addition, ADD overall score was found to be associated with adolescent pregnancy (OR = 1.11, 95% CI = 1.01-1.24, p = 0.036).
Conclusions: Symptoms of attention deficit and hyperactivity can represent another factor associated with teenage pregnancy

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HNO. 2019 Aug;67:576-83.

GUIDELINE: AUDITORY PROCESSING AND PERCEPTION DISORDERS: DIFFERENTIAL DIAGNOSIS : S1 GUIDELINE OF THE GERMAN SOCIETY OF PHONIATRICS AND PEDIATRIC AUDIOLOGY.

Nickisch A, Kiese-Himmel C, Wiesner T, et al.

As a prerequisite for diagnosing auditory processing disorders (APD), differential diagnostic considerations are essential, especially with regard to language comprehension disorders, attention deficit hyperactivity disorder, specific cognitive impairments (e.g., in memory or multi-modal perception performance), specific learning disorders affecting reading and/or spelling, and autistic-type diseases. The current clinical management is presented in detail in the updated APD guidelines, as are the resulting conclusions for the interpretation of individual test results

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IBRO Reports. 2019;6:S336-S337.

ADHD-RELATED DEVELOPMENTAL ALTERATIONS IN FUNCTIONAL CONNECTIVITY.

Kang H, Kim JI, Huh Y, et al.

This study aims to examine the ADHD-related developmental change of functional brain network topology. We investigated the multi-scale topological feature of brain network based persistent homology and the degree of information flow based on volume entropy (VE). The multi-scale topological feature was represented by single linkage matrix (SLM), which informed the change of connected structure. The VE and nodal capacity (NC) were global and local features showed the degree of information flow on the network. The resting state fMRI (rfMRI) data (63 ADHD and 63 typical developing; TDC, mean age = 10.2 -¦ 2.8) was age and gender-matched. We tested: (1) the interaction effects of SLM or NC between age and group using general linear model and (2) correlation between features and behavioral scores. The connectivity between mid-cingulate and cerebellum in SLM linearly increased with age in ADHD, but not in TDC (P < .005). The quadratic changes over age were found in the connectivity between cingulate and cerebellum regions in ADHD (P < .005). The VE between groups was not significantly different, but the VE of TDC was significantly correlated with age (P < .005), but not that of ADHD. The NC of the right supramarginal and cingulate regions increased with age, the NC of cerebellum decreased in ADHD (P < .05). The correlations between the NC of

cerebellum and behavioral scores (Stroop and CCTT) were significant in ADHD. Our findings suggest the overconnectivity between cingulo-cerebellum is related to developmental alteration in ADHD. Especially, the dysfunction of cerebellum in brain network might be associated with ADHD phenotype

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IBRO Reports. 2019;6:S318-S319.

SLEEP AND PARENT-REPORTED EXECUTIVE FUNCTIONING IN TYPICALLY DEVELOPING AND DRUG-NÄVE ADHD CHILDREN.

Eliozishvili M, Basishvili T, Tchintcharauli T, et al.

Introduction: Sleep problems and deficits in executive functions (EF) have been frequently described in children with attention deficit hyperactivity disorder (ADHD). However, studies on the relationship between sleep and EF in ADHD children are limited. We aimed to investigate the longitudinal relationships between sleep and executive functioning measures in drug-näve ADHD and typically developing children, and present first time point results from this study.

Methods: Nine ADHD children (combined subtype, DSM-V criteria, age 12.4 -¦ 0.54 years) without any additional comorbid condition or sleep disordered breathing problem, and eight typically developing controls (12.1 -¦ 0.37) were recruited. All subjects underwent an adaptation night and all night polysomnography at the Laboratory. Actigraphy devices/sleep diaries documented sleep-wake schedules. EF was assessed by the Comprehensive Executive Function Inventory (CEFI, parent form). Actigraphy counts/minute during the CEFI sessions were used as a measure of hyperactivity.

Results: ADHD children slept less compared to control group (463.8 vs. 533.5 min, p = 0.06) and had higher but non-significant awakening index during sleep. The two groups differed significantly only on latency to stage 2 (ADHD = 15.3 min, control = 8.6 min, p = 0.01). Children with ADHD had a higher level of hyperactivity and poorer EF behaviors on all CEFI measures (p < 0.01). Being more hyperactive was correlated with lower levels of all CEFI measures, except flexibility, inhibitory control and initiation in the control group. A correlation between hyperactivity and EF in ADHD group was significant for inhibitory control, initiation, planning and CEFI full scale. There was no significant correlation between sleep measures and EF in any group.

Conclusion: drug-näve ADHD children without learning/intellectual disabilities still show poorer EF behaviors. However, ADHD children do not exhibit a major alteration in sleep parameters, nor was there evidence of a significant association of sleep with EF. Follow-up results of this longitudinal study are important to clarify the trajectory of the relationship between sleep, hyperactivity and EF. The study was supported by a grant FR17_94

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IBRO Reports. 2019;6:S484.

SLEEP EEG AS AN INDEX OF BRAIN MATURATION IN TYPICALLY DEVELOPING AND DRUG-NÄVE ADHD CHILDREN.

Darchia N, Basishvili T, Eliozishvili M, et al.

Background: The structural MRI studies indicate that attention deficit hyperactivity disorder (ADHD) is associated with delayed brain maturation. Brain electrophysiological evidence for a maturational delay is mixed. The steep decline in low frequency EEG activity across adolescence provides a sleep EEG test for a maturational delay associated with ADHD. We present first time point results from the longitudinal study investigating maturational trajectories of sleep EEG, sleep architecture and executive functions in drug-na+»ve ADHD and typically developing children.

Methods: Nine ADHD children (combined subtype, DSM-V criteria, mean age 12.4 -¦ 0.54 years) without any additional comorbid condition or sleep disordered breathing problem, and eight typically developing controls (12.1 -¦ 0.37) were recruited. All subjects underwent an adaptation night and all night polysomnography at the Laboratory. Actigraphy devices and sleep diaries documented sleep-wake schedules. Sleep EEG was analyzed using fast Fourier transform (FFT).

Results: No significant effect was found on sleep-wake parameters between groups except latency to stage 2 (ADHD = 15.3 min, control = 8.6 min, p = 0.01). EEG power (energy/second) did not differ significantly between groups for any frequency band (0.3ΓÇô100 Hz) in all night non-rapid eye movement (NREM) sleep nor in first 5 h of NREM sleep. Delta (1.7-4 Hz) and theta (4-7.91 Hz) power were slightly higher in ADHD

group for all night (859.61 vs. 825.03 ++v2 delta; 104.06 vs. 83.92 ++v2 theta) as well as for 5 h NREM sleep (957.54 vs. 950.87 ++v2 delta; 111.09 vs. 89.31 ++v2 Γ theta) but non-significant.
Conclusion: Drug-näve ADHD children in our study did not display a significant sleep EEG alterations, nor was there evidence of the elevated delta or theta EEG activity that would indicate delayed brain maturation at this first time point. Follow-up results of this longitudinal study are crucial to identify if delta and theta power decline in ADHD children demonstrate a maturational delay and are, therefore, functional brain electrophysiology measures that would complement the structural MRI measures. The study was supported by a grant FR17_94

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IBRO Reports. 2019;6:S65.

PATIENTS WITH ADHD ARE BEING OVERMEDICATED (FOR OPTIMAL COGNITIVE PERFORMANCE).

Ling DS, Balce K, Weiss M, et al.

We tested children and youth with ADHD on cognitive tasks once on the full dose of psychostimulant they were prescribed and once on half that dose, in a triple-blind crossover design. Most performed better on half their dose; none performed better on the dose their physician had selected for them. We had predicted this outcome because of the way psychostimulants act on the brain. At moderate to high doses psychostimulants increase DA levels in the brain by inhibiting reuptake of DA by dopamine transporter (DAT). DAT is abundant in the striatum but sparse in prefrontal cortex (PFC). Thus, at moderate to high doses stimulants would be likely to help with the aspects of ADHD most strongly tied to the striatum (behavioral dysregulation). At low doses, stimulants specifically and selectively increase DA in PFC and improve the signal: noise ratio in PFC. That would be expected to help with the aspects of ADHD most closely tied to the PFC (cognitive impairments). By targeting optimal behavioral regulation, physicians have been compromising cognitive functioning sometimes to the extent of a child being in a daze in class, not being at all disruptive but not getting anything out of the lesson either. The findings in this study are important. It could potentially change the way physicians approach ADHD treatment, lower the cost of prescription drugs associated with ADHD, and help children perform better in school and life

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IBRO Reports. 2019;6:S476.

ASSOCIATION BETWEEN POLYGENIC RISK SCORES FOR ATTENTION-DEFICIT/HYPERACTIVITY DISORDER AND ASTHMA IN THE 1982 PELOTAS BIRTH COHORT.

Leffa DT, Barros F, Rohde LA, et al.

There is growing evidence of high comorbidity between ADHD and asthma. This association is significant even after controlling for environmental confounders, suggesting shared genetic mechanisms. Polygenic risk scores (PRS) are used to quantify cumulative effects of a number of genes on disease susceptibility. We aimed at evaluating if PRS for ADHD were able to predict asthma in the 1982 Pelotas birth cohort, thus indicating shared genetic mechanisms. The 1982 Pelotas birth cohort comprises 5914 born infants from 1982 followed by 30 years with a retention rate of 68.1%. From those, 3574 were screened for ADHD at 30 years. A full dimensional assessment was performed after positive screening. PRS for ADHD were calculated using the European population of the Psychiatric Genomics Consortium as the discovery sample. PRSice v1.25 was used to calculate PRS at different p-value thresholds. Subjects with asthma were divided in: (1) lifetime (prior diagnosis at any time); (2) early-onset (diagnosis at 2 years); (3) life-course persistent (symptoms at 30 years). Logistic regression was used to access the association between: (1) PRS and ADHD diagnosis according to DSM-V; (2) ADHD diagnosis and asthma; (3) ADHD dimensional symptoms and asthma; and (4) PRS for ADHD and asthma. In addition, linear regression was used to access the association between PRS and ADHD dimensional symptoms. A total of 666 subjects had a positive screen for ADHD, and 74 were diagnosed according to DSM-V. PRS was not associated with ADHD diagnosis, but was associated with hyperactivity/impulsivity symptoms. ADHD symptoms, especially hyperactivity/impulsivity, were associated with asthma. There was no significant association between PRS and asthma, although there was a trend in life-course persistent cases. We did not find evidence of shared genetic factors underlying ADHD and

asthma. Therefore, our results point towards an influence of unmeasured environmental confounders on the comorbidity between both diseases

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Indian J Psychiatry. 2019;61:544-45.

PEDIATRIC MOYAMOYA DISEASE PRESENTING AS ATTENTION DEFICIT HYPERACTIVITY DISORDER: TIME TO PAY ATTENTION.

Patra S, Patnaik A.

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Int Arch Allergy Immunol. 2019;180:37-43.

RISK OF ATOPIC DISEASES AMONG SIBLINGS OF PATIENTS WITH ATTENTION-DEFICIT HYPERACTIVITY DISORDER: A Nationwide Population-Based Cohort Study.

Chang TH, Tai YH, Dai YX, et al.

BACKGROUND: Increasing evidence suggests a positive association between attention-deficit hyperactivity disorder (ADHD) and atopic diseases. However, the risk of atopic diseases in unaffected siblings of patients with ADHD has not been investigated.

OBJECTIVE: To investigate the risk of developing atopic diseases among unaffected siblings of ADHD probands.

METHODS: Using data from the Taiwan National Health Insurance Research Database, 20,170 unaffected siblings of patients with ADHD born between 1980 and 2000 and 80,680 age-, birth time-, and residence-matchedcontrols were included in this study. Diagnoses of atopic diseases, including asthma, atopic dermatitis, allergic rhinitis, and allergic conjunctivitis, were ascertained from 1996 or the birth time until the end of 2011.

RESULTS: Breslow-Cox proportional hazard regression analyses with adjustment for demographic data showed that compared with the controls, unaffected siblings of patients with ADHD had a higher risk of developing asthma (relative risk [RR], 1.19; 95% confidence interval [CI], 1.15-1.24), atopic dermatitis (RR, 1.10; 95% CI, 1.04-1.16), allergic rhinitis (RR, 1.17; 95% CI, 1.14-1.21), allergic conjunctivitis (RR, 1.13; 95% CI, 1.09-1.17), and any of these atopic diseases (RR, 1.13; 95% CI, 1.10-1.15).

CONCLUSION: The unaffected siblings of ADHD probands were more likely to develop atopic diseases compared with the controls, suggesting shared risk factors for both diseases

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Int J Audiol. 2018 Oct;57:764-75.

DEVELOPING THE AUDITORY PROCESSING DOMAINS QUESTIONNAIRE (APDQ): A DIFFERENTIAL SCREENING TOOL FOR AUDITORY PROCESSING DISORDER.

O'Hara B, Mealings K.

OBJECTIVE: The aim of this study was to develop a screening questionnaire for auditory processing disorder (APD).

DESIGN: Fifty-two questions were created to enable parent/teacher proxies to rate students listening skills in terms of auditory processing, attention and language factors.

STUDY SAMPLE: Parents rated their child's frequency of competent performance (regularly, often, sometimes or rarely) on 52 questions. Scores were calculated for three scales: auditory processing, attention and language. Data was collected from 198 normal controls, 20 students with auditory processing disorder, 40 students with attention deficit hyperactivity disorder and 10 students with a learning disability. Subjects were split into a younger group (7-10 y) and an older group (11-17 y).

RESULTS: Factor analysis revealed substantial internal validity. Analysis of external validity using a regression model revealed significant differences between normal and clinical groups for all scales ($p < 0.001$) and also significantly separated the three clinical groups. A group differential analysis of scale score results clearly demonstrated inter-group differences at 89% (on average) sensitivity and specificity levels.

CONCLUSION: The auditory processing domains questionnaire appears to be an effective screening questionnaire for APD with scale score patterns likely to be helpful in making appropriate clinical referrals

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International Journal of Preventive Medicine. 2019;10:1-5.

RELATIONSHIP BETWEEN ANTIOXIDANT STATUS AND ATTENTION DEFICIT HYPERACTIVITY DISORDER AMONG CHILDREN.

Nasim S, Najafi M, Ghazvini M, et al.

Background: Attention deficit hyperactivity disorder (ADHD) is one of the prevalent neuropsychiatric disorders in childhood. In general, diagnoses of ADHD include inattention, hyperactivity, and impulsivity. Recent studies have reported increased oxidative stress in psychiatric disorders such as ADHD, but the results are conflicting. This research aimed to study the relationship between antioxidant status and ADHD in children of 6-13 years old.

Methods: From schools, 32 ADHD students whose diseases were diagnosed by child and adolescence psychiatrist based on Diagnostic and Statistical Manual of Mental Disorders-IV index were recruited; moreover, 32 healthy subjects, which according to the medical history questionnaire of psychiatric disorder had not had chronic disease, were selected. Total antioxidant capacity (TAC), catalase (CAT), glutathione (GSH), and malondiadehyde (MDA) were measured. General information, health history, and medication history were collected. All participants completed a 168-item food frequency questionnaire. Dietary intakes of antioxidants were obtained through this questionnaire.

Results: There was no significant difference between mean of energy intake and Zn, Se, vitamin E, C, and +¦-carotene as antioxidants between the two groups. The mean of serum TAC, GSH level, and CAT level in the patients were significantly lower than the healthy group ($P < 0.001$), but the mean of MDA was not significantly different between the two groups ($P = 0.18$).

Conclusions: The result of this study indicates that, in ADHD, the serum levels of GSH, CAT, and TAC decrease; the level of antioxidant in the serum has been compromised to fight oxidative stress. More perspective studies with large sample sizes are essential to confirm these findings

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Internet Interventions. 2019.

SELF-DIRECTED OR THERAPIST-LED PARENT TRAINING FOR CHILDREN WITH ATTENTION DEFICIT HYPERACTIVITY DISORDER? A RANDOMIZED CONTROLLED NON-INFERIORITY PILOT TRIAL.

Breider S, de BA, Nauta MH, et al.

Background and objectives: Therapist-led behavioral parent training is a well-established treatment for behavior problems in children with attention-deficit/hyperactivity disorder (ADHD). However, parental attrition is high; self-directed forms of parent training may be a promising alternative. To date, no studies have compared these two forms of parent training in referred children with ADHD. The objectives of this pilot study were to examine the non-inferiority of a blended parent training (i.e. online program + supportive therapist contact) in comparison to its therapist-led equivalent (i.e. face-to-face parent training) regarding effects on behavioral problems, and to compare attrition rates, parental satisfaction, and therapist-time between both treatments.

Methods: 21 school-aged children with ADHD and behavioral problems, who had been referred to an outpatient mental health clinic, were randomized to blended (n = 11) or face-to-face (n = 10) parent training. Behavior problems were measured with the Child Behavior Checklist. Treatment completers and dropouts were included in the analyses.

Results and conclusions: Blended parent training was not found to be non-inferior to face-to-face parent training in the reduction of behavior problems. Parents in the blended condition dropped out of treatment significantly earlier than parents in the face-to-face condition and were less satisfied. Therapists in the blended condition spent significantly less time on parent training than therapists in the face-to-face condition

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Iran J Psychiatr Behav Sci. 2018;12.

PREVALENCE OF CHILDHOOD ATTENTION-DEFICIT/HYPERACTIVITY DISORDER (ADHD) IN METHAMPHETAMINE DEPENDENCE: A DESCRIPTIVE STUDY.

Farnia V, Mousavi SB, Tatari F, et al.

Background: The high comorbidity of psychiatric disorders and substance dependence has been reported in children clinical and epidemiological as a study.

Objectives: The aim of this study was to determine the prevalence of childhood attention-deficit/hyperactivity disorder (ADHD) among methamphetamine dependence.

Methods: This study was a descriptive cross - sectional study that has been done in 2015 - 2016. The study population consisted of individuals referred with methamphetamine dependence to Kermanshah Farabi hospital. Among them, 960 patients were chosen through access selection to collect data the epidemiological characteristics questionnaire and the Wender Utah rating scale for ADHD children were used. Data were analyzed through SPSS 18 software descriptive statistical methods and chi-square test.

Results: The prevalence of childhood ADHD was 29.9%. In the study population 155 patients (16.17) had hyperactivity disorder, 402 patients (41.9%) had attention deficit disorder, and 141 patients (14.7%) had hyperactivity and attention deficit disorders simultaneously. In addition, data analysis reveals the meaningful relationship between childhood ADHD and gender marital status education as well as age range ($P < 0.001$). For participants, job and age of first methamphetamine use, which $P = 0.484$ and $P = 0.453$, respectively, no meaningful relationship was found to ADHD.

Conclusions: Behavioral disorders, especially ADHD, can make a background for methamphetamine dependence tendency. ADHD treatments may prevent this disposition towards methamphetamine dependence

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Iran J Psychiatr Behav Sci. 2018;12.

IMPACT OF LONG-TERM USE OF METHYLPHENIDATE ON VISUAL MEMORY OF DRUG-NA+»VE CHILDREN WITH ATTENTION DEFICIT DISORDER.

Seyedtabaei R, Seyedtabaei R, Mohammadi SD, et al.

Background: Diverse cognitive functions and behaviors have been monitored in the two sub-types of attention deficit/hyperactivity disorder (ADHD) including the combined type and the inattentive type. Objectives: Previous studies have shown that ADHD children have problems in visual memory, and short and long-term use of methylphenidate (MPH) improves these functions, but fewer studies have been done on the inattentive subgroup, namely attention deficit disorder (ADD). Due to the different cognitive functions in these two ADHD subgroups, this study was done to investigate the long-term use of MPH on the visual memory of ADD children.

Methods: A 4-week experimental clinical trial using MPH (1 mg/kg/dose) was conducted. Participants were 20 children aged 6 - 11 years with ADD that came to the Rouzbeh Clinic in Tehran in 2010. Cambridge neuropsychological test automated battery (CANTAB) tests of visual memory were used for assessment.

Results: The long-term use of MPH improved 12 aspects of paired associated learning (PAL) such as first-trial memory score, the number of mean mistakes to success and mean efforts to success ($P < 0.05$). However, MPH did not improve the stages completed in the first trial, the total errors, and the total errors adjusted in the three-shape step of PAL ($P > 0.05$). MPH also improved all aspects of pattern recognition memory (PRM) ($P < 0.05$) and the mean correct latency of spatial recognition memory (SRM) ($P < 0.05$). However, MPH had no effect on delayed matching to sample (DMS) ($P > 0.05$).

Conclusions: MPH improved performance on the PAL, PRM, and SRM visual evaluating tests of ADD patients. Nevertheless, the patients did not show any improvement in the DMS test. In comparison with previous studies, our results would suggest that MPH has similar effects on the visual memory of ADD and ADHD patients

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J Altern Complement Med. 2019 Jun;25:613-22.

AN OBSERVATIONAL PRELIMINARY STUDY ON THE SAFETY OF LONG-TERM CONSUMPTION OF MICRONUTRIENTS FOR THE TREATMENT OF PSYCHIATRIC SYMPTOMS.

Rucklidge JJ, Eggleston MJF, Ealam B, et al.

Objectives: There is an increasing body of literature documenting the efficacy of micronutrients (vitamins and minerals) interventions for the treatment of psychiatric problems in the short term; however, long-term safety is largely unexplored. The goal of this observational study was to investigate the safety of two commercially available broad-spectrum micronutrient formulas (EMPowerplus and Daily Essential Nutrients) given at doses above the Recommended Dietary Allowances for the long-term treatment of individuals with psychiatric symptoms.

Design: Participants on long-term treatment with micronutrients (medication-free) for psychiatric problems (attention-deficit hyperactivity disorder [ADHD, n = 21], anxiety/depression [n = 13]) were identified from ongoing research studies and the community through purchasing records. Seventeen children and 17 adults had blood tests to assess their full blood count, coagulation profile, liver and kidney function, fasting glucose, iron studies, key nutrients, and prolactin. Questionnaires assessed psychological/psychiatric functioning. Seventeen of the participants had completed the same measures pretreatment.

Results: The average length of consuming micronutrients was 2.66 years (standard deviation = 2.86). Excluding B12 (which was elevated for almost all participants), 94.6% of all blood test results were within the test reference ranges. One participant was diagnosed with hemochromatosis based on iron studies. No other clinically relevant adverse changes in blood results were identified pre- and post-treatment. No clinically significant adverse effects were reported. Post-treatment psychometrics identified that 85% of the participants were in nonclinical ranges for measures of ADHD, depression, anxiety, and stress.

Conclusions: We report preliminary evidence for the safety of long-term commercially available micronutrients, although questions remain. Overall, the substantial psychiatric benefits observed appear to outweigh the minimal observed risks in these participants. Screening for potential medical problems is recommended before initiating treatment. Long-term pharmacovigilance monitoring is required to ascertain any rare but significant adverse events

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J Atten Disord. 2018 Jun;22:796-805.

THE RELATIONSHIP BETWEEN MOTOR SKILLS, SOCIAL PROBLEMS, AND ADHD SYMPTOMATOLOGY: DOES IT VARY ACCORDING TO PARENT AND TEACHER REPORT?

Goulardins JB, Rigoli D, Loh PR, et al.

OBJECTIVE: This study investigated the relationship between motor performance; attentional, hyperactive, and impulsive symptoms; and social problems. Correlations between parents' versus teachers' ratings of social problems and ADHD symptomatology were also examined.

METHOD: A total of 129 children aged 9 to 12 years were included. ADHD symptoms and social problems were identified based on Conners' Rating Scales-Revised: L, and the McCarron Assessment of Neuromuscular Development was used to assess motor skills.

RESULTS: After controlling for ADHD symptomatology, motor skills remained a significant predictor of social problems in the teacher model but not in the parent model. After controlling for motor skills, inattentive (not hyperactive-impulsive) symptoms were a significant predictor of social problems in the parent model, whereas hyperactive-impulsive (not inattentive) symptoms were a significant predictor of social problems in the teacher model.

CONCLUSION: The findings suggested that intervention strategies should consider the interaction between symptoms and environmental contexts

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J Atten Disord. 2018 Jul;22:839-47.

EARLY VISUAL FORAGING IN RELATIONSHIP TO FAMILIAL RISK FOR AUTISM AND HYPERACTIVITY/INATTENTION.

Gliga T, Smith TJ, Likely N, et al.

OBJECTIVE: Information foraging is atypical in both autism spectrum disorders (ASDs) and ADHD; however, while ASD is associated with restricted exploration and preference for sameness, ADHD is characterized by hyperactivity and increased novelty seeking. Here, we ask whether similar biases are present in visual foraging in younger siblings of children with a diagnosis of ASD with or without additional high levels of hyperactivity and inattention.

METHOD: Fifty-four low-risk controls (LR) and 50 high-risk siblings (HR) took part in an eye-tracking study at 8 and 14 months and at 3 years of age.

RESULTS: At 8 months, siblings of children with ASD and low levels of hyperactivity/inattention (HR/ASD-HI) were more likely to return to previously visited areas in the visual scene than were LR and siblings of children with ASD and high levels of hyperactivity/inattention (HR/ASD+HI).

CONCLUSION: We show that visual foraging is atypical in infants at-risk for ASD. We also reveal a paradoxical effect, in that additional family risk for ADHD core symptoms mitigates the effect of ASD risk on visual information foraging

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J Atten Disord. 2018 Nov;22:1218-23.

MATERNAL FUNCTIONING DIFFERENCES BASED ON ADHD SUBTYPE.

Weinberger KA, Gardner DM, Gerdes AC.

OBJECTIVE: Maternal functioning differences in parenting stress, parental efficacy, and parenting behaviors were examined for mothers of children with ADHD.

METHOD: Participants included 29 mothers of children with ADHD, Predominantly Inattentive Type (ADHD-I) and 38 mothers of children with ADHD, Predominantly Hyperactive-Impulsive or Combined Type (ADHD-HI/C).

RESULTS: Findings suggest that mothers of children with ADHD-HI/C reported significantly greater parenting stress and engaged in more negative parenting behaviors than mothers of children with ADHD-I.

CONCLUSION: This study suggests that tailoring behavioral parent training based on ADHD subtype may be particularly helpful for parents of children with ADHD-HI/C

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J Atten Disord. 2018 Aug;22:942-46.

NIGHT-TO-NIGHT VARIABILITY OF SLEEP IN CHILDREN WITH ADHD AND TYPICALLY DEVELOPING CONTROLS.

Poirier A, Corkum P.

OBJECTIVE: Research results on the nature of sleep problems in children with ADHD are highly inconsistent. It is frequently reported that children with ADHD show more night-to-night variability in sleep than their typically developing (TD) peers, but this finding is also inconsistent. Lack of methodological control may account for these inconsistent findings. The current study examined the night-to-night variability of sleep between TD children and children with ADHD who were rigorously diagnosed, medication naive, and free from comorbid mental health disorders.

METHOD: Sleep parameters were analyzed for night-to-night variability across 4 weekday nights using actigraphy in 50 children with ADHD and 50 age- and sex-matched TD children.

RESULTS: There was a significant night-to-night variability for only sleep duration, but this was similar in both groups.

CONCLUSION: These findings suggest that sleep problems in children with ADHD are not due to greater variability in sleep parameters relative to their TD peers

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J Atten Disord. 2018 Oct;22:1158-72.

OVERWEIGHT IN BOYS WITH ADHD IS RELATED TO CANDIDATE GENES AND NOT TO DEFICITS IN COGNITIVE FUNCTIONS.

Hanc T, Dmitrzak-Weglarz M, Borkowska A, et al.

OBJECTIVE: The aim of the study was to assess the relationship of overweight, the polymorphisms of selected candidate genes, and deficits in the executive functions among children with ADHD.

METHOD: We examined 109 boys with ADHD aged between 7 and 17 years. The study indicated variants of 14 polymorphisms in eight candidate genes. We applied seven neuropsychological tests to evaluate the executive functions. Overweight was diagnosed on the basis of the guidelines of the International Obesity Task Force.

RESULTS: Analyses revealed significant association between DRD4 rs1800955, SNAP25 rs363039 and rs363043, 5HTR2A rs17288723, and overweight in boys with ADHD. There were no significant differences in the level of neuropsychological test results between patients with overweight and without overweight.

CONCLUSION: Overweight in boys with ADHD is associated with polymorphisms in three candidate genes: DRD4, SNAP25, and 5HTR2A, but not through conditioning deficits in cognitive functions

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J Atten Disord. 2018 Oct;22:1095-108.

PREVALENCE OF OVERWEIGHT AND OBESITY IN CHILDREN AND ADOLESCENTS WITH ADHD: THE SIGNIFICANCE OF COMORBIDITIES AND PHARMACOTHERAPY.

Racicka E, Hanc T, Giertuga K, et al.

OBJECTIVE: Assessment of the prevalence of overweight and obesity in children and adolescents with ADHD with emphasis on pharmacological treatment and comorbid disorders.

METHOD: We analyzed 408 medical records of patients with ADHD aged 7 to 18.

RESULTS: The prevalence of overweight (14.71% vs. 12.83%, chi(2) = 3,586.43, p < .001) and obesity (6.37% vs. 3.45%, chi(2) = 3,588.19, p < .001) was significantly higher in children with ADHD compared with the population. There was significantly higher incidence of obesity in patients with comorbid diagnosis of adjustment disorder (22.22% vs. 4.42%, chi(2) = 5.66, p = .02) and mental retardation (19.05% vs. 4.42%, chi(2) = 7.63, p = .005). Pharmacological treatment was associated with a higher incidence of obesity (8.37% vs. 2.76%, chi(2) = 4.92, p = .03).

CONCLUSION: Standardized body mass index (BMI), prevalence of overweight, and obesity was higher in patients with ADHD compared with the population. Higher incidence of obesity was shown in patients with analyzed comorbidities

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J Atten Disord. 2018 Jun;22:776-86.

SOCIAL SKILLS DEFICITS IN A VIRTUAL ENVIRONMENT AMONG SPANISH CHILDREN WITH ADHD.

Garcia-Castellar R, Jara-Jimenez P, Sanchez-Chiva D, et al.

OBJECTIVE: Research assessing the social skills of children with ADHD has predominantly relied upon North American samples. In addition, most existing work has been conducted using methodology that fails to use a controlled peer stimulus; such methods may be more vulnerable to cultural influence.

METHOD: We examined the social skills of 52 Spanish children (ages 8-12) with and without ADHD using a controlled Chat Room Task, which simulates a virtual social environment where peers' responses are held constant, so that participants' social skills may be assessed.

RESULTS: After statistical control of typing and reading comprehension skills, Spanish children with ADHD gave fewer prosocial comments and had greater difficulty remembering central details from the conversation between the peers, relative to comparison children.

CONCLUSION: The virtual Chat Room Task may be useful to assess social skills deficits using a controlled paradigm, resulting in the identification of common social deficiencies cross-culturally

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J Atten Disord. 2018 Nov;22:1289-96.
BEHAVIORAL OBSERVATIONS OF PARENTS WITH ADHD DURING PARENT TRAINING.
Babinski DE, Waxmonsky JG, Waschbusch DA, et al.
OBJECTIVE: Several studies suggest that parental ADHD impedes behavioral parent training (BPT) outcomes. Parental ADHD symptoms exhibited during BPT may interfere with the acquisition of new skills. This study explored the observed behavior of parents with ADHD during BPT.
METHOD: Parents of children with ADHD attending group BPT completed self-ratings of their ADHD symptoms. Parents indicating a moderate level of ADHD symptoms were administered a clinical interview, and 37.3% of parents met ADHD criteria based on Diagnostic and Statistical Manual of Mental Disorders (4th ed.; DSM-IV) clinician-rated symptom counts.
RESULTS: Parents with high ADHD symptoms displayed more total and off-task violations compared with parents with low ADHD symptoms, although no significant differences emerged for other behaviors (i.e., working quietly, using materials appropriately, and remaining in seat), absences, or tardiness.
CONCLUSION: Parental ADHD symptoms were manifested during BPT. Future research should clarify the nature of parental behavior in BPT as a possible mechanism explaining the relation between parental ADHD and impaired BPT outcomes

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J Atten Disord. 2018 Aug;22:984-93.
PREFERENCE FOR SMALLER SOONER OVER LARGER LATER REWARDS IN ADHD: CONTRIBUTION OF DELAY DURATION AND PARADIGM TYPE.
Yu X, Sonuga-Barke E, Liu X.
OBJECTIVE: Individuals with ADHD preferentially choose smaller sooner (SS) over larger later (LL) rewards, termed impulsive choice. This has been observed to different degrees on single-choice and more complex discounting tasks using various types of rewards and durations of delays. There has been no direct comparison of performance of ADHD children using these two paradigms.
METHOD: Two experimental paradigms, single-choice and temporal discounting, each including two delay conditions (13 and 25 s), were administered to 7- to 9-year-old children with ADHD (n = 17) and matched controls (n = 24).
RESULTS: Individuals with ADHD chose more SS rewards than controls on both tasks, but in the long delay condition only.
CONCLUSION: These findings demonstrate that delay durations rather than paradigm types determine laboratory-based measures of choice impulsivity in ADHD

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J Atten Disord. 2018 Jul;22:10S-20S.
FOLLOW-UP OF YOUNG ADULTS WITH ADHD IN THE MTA: DESIGN AND METHODS FOR QUALITATIVE INTERVIEWS.
Weisner TS, Murray DW, Jensen PS, et al.
OBJECTIVE: Qualitative interviews with 183 young adults (YA) in the follow-up of the Multimodal Treatment Study of Children With and Without ADHD (MTA) provide rich information on beliefs and expectations regarding ADHD, life's turning points, medication use, and substance use (SU).
METHOD: Participants from four MTA sites were sampled to include those with persistent and atypically high SU, and a local normative comparison group (LNCG). Respondents were encouraged to "tell their story" about their lives, using a semistructured conversational interview format.
RESULTS: Interviews were reliably coded for interview topics. ADHD youth more often desisted from SU because of seeing others going down wrong paths due to SU. Narratives revealed very diverse accounts and explanations for SU-ADHD influences.
CONCLUSION: Qualitative methods captured the perspectives of YAs regarding using substances. This information is essential for improving resilience models in drug prevention and treatment programs and for treatment development for this at-risk population

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J Atten Disord. 2018 Aug;22:1008-16.

MANAGING EVERYDAY OCCUPATIONS AS A PREDICTOR OF HEALTH AND LIFE SATISFACTION AMONG MOTHERS OF CHILDREN WITH ADHD.

Avrech BM, Jlole MS, Bart O.

OBJECTIVE: Raising a child with special needs disturbs the balance of family life and affects mothers' everyday life. The purpose of this study was to assess the contribution of occupational competence, occupational settings, and role load to the health and life satisfaction of Arab mothers of children with and without ADHD.

METHOD: Participants included 40 Israeli Arab women aged 25 to 40 years. Half were mothers of children with ADHD and half were mothers of children without ADHD. Data were collected by using four self-report questionnaires.

RESULTS: Occupational competence and occupational settings predicted mothers' mental health and life satisfaction. Having or not having a child with ADHD only reflects a minor contribution.

CONCLUSION: Enhancing mothers' occupational competence and settings may increase their health and life satisfaction. This study highlights the need to focus on maternal occupational competence and settings as they affect mothers' health and well-being when providing intervention to children with ADHD

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J Atten Disord. 2018 Jul;22:864-71.

ANTI-BASAL GANGLIA ANTIBODIES AND STREPTOCOCCAL INFECTION IN ADHD.

Aguilera-Albesa S, Crespo-Eguilaz N, Del Pozo JL, et al.

OBJECTIVE: Group A Streptococcus has been associated with ADHD, tic disorders (TD), and obsessive-compulsive disorder (OCD) through anti-basal ganglia antibodies (ABGA).

METHOD: We investigated the association between ABGA and streptococcal exposure with behavioral, motor, and cognitive measures in 38 children with ADHD not comorbid to OCD or TD (nc-ADHD) and in 38 healthy children. An additional group of 15 children with TD and/or OCD was examined.

RESULTS: ABGA titers were present in 3% of nc-ADHD patients and controls but in 27% of TD and/or OCD patients. Evidence of streptococcal exposure was similar between ADHD patients and controls living in the same urban area. Behavioral, motor, and cognitive measures were not associated with anti-streptococcal antibodies.

CONCLUSION: ABGA do not distinguish nc-ADHD from controls. The differences in the frequency of streptococcal exposure in previous studies are determined by the dynamic nature of the infection rather than the behavioral phenotype of ADHD

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J Atten Disord. 2018 Sep;22:1049-55.

USING THE PERSONALITY ASSESSMENT INVENTORY TO IDENTIFY ADHD-LIKE SYMPTOMS.

Watson J, Liljequist L.

OBJECTIVE: The purpose of this study was to investigate the possibility of creating a new scale on the Personality Assessment Inventory (PAI) to assess for ADHD-like symptomatology.

METHOD: Two approaches to scale development were compared: (a) stepwise regression using PAI scales and subscales as predictors and the CAARS-H index as the dependent variable and (b) a MANOVA using discharge diagnosis as the grouping variable and PAI scales and subscales as the dependent variables.

RESULTS: Stepwise regression identified six PAI scales and subscales (PIM, RXR, SOM-S, ARD-T, MAN-A, and SCZ-T) that were responsible for a large proportion of variance (39%) in the CAARS-H index, and the MANOVA also identified six subscales that significantly differed between those clients eventually diagnosed with ADHD and those not diagnosed (ANT-S, SCZ-T, MAN-A, ANX-C, BOR-S, and MAN-G).

CONCLUSION: Although each set produced statistically significant findings, neither produced high correct classification rates in the eventual diagnosis of ADHD

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J Atten Disord. 2018 Nov;22:1246-54.

IMPACT OF MATERNAL AND CHILD RACE ON MATERNAL RATINGS OF ADHD SYMPTOMS IN BLACK AND WHITE BOYS.

Barrett C, Dupaul GJ.

OBJECTIVE: Examine the influence of maternal and child race on ADHD symptom ratings.

METHOD: Participants were Black (n = 63) and White (n = 68) mothers randomly assigned to view a 13-min videotape of either a Black or White boy displaying similar levels of ADHD-related behaviors during free play and meal situations. Mothers then completed an ADHD rating scale.

RESULTS: With maternal age and socioeconomic status (SES) as covariates, Black mothers provided significantly higher ratings of inattentive and hyperactive-impulsive symptoms than did White mothers regardless of child race. The effect of child race was not statistically significant.

CONCLUSIONS: Maternal race appears to be more important than child race in accounting for differences in ADHD symptom ratings between Black and White boys. It is critical to understand variables related to these differences and develop assessment measures that lead to equivalent, accurate diagnostic decisions across racial subgroups

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J Atten Disord. 2018 Sep;22:1056-65.

ASSOCIATION OF THE CONNERS' KIDDIE CONTINUOUS PERFORMANCE TEST (K-CPT) PERFORMANCE AND PARENT-REPORT MEASURES OF BEHAVIOR AND EXECUTIVE FUNCTIONING.

Barnard H, Rao R, Xu Y, et al.

OBJECTIVE: To explore the relationship between the Conners' Kiddie Continuous Performance Test (K-CPT) performance and parent-report measures of child behavior and executive functioning, and clarify the role of sex in K-CPT performance in preschoolers.

METHOD: Mothers and children recruited to the Health Outcomes and Measures of the Environment Study with complete 5-year assessment data relevant to the analyses were included (N = 127). We examined the association between K-CPT scores and Behavior Assessment System for Children-Second Edition (BASC-2) and Behavior Rating Inventory of Executive Function (BRIEF) scores, with covariate adjustment.

RESULTS: We found no significant associations between K-CPT, BASC-2, and BRIEF scores in the full sample. In sex-stratified analyses, we found unusually fast reaction time on K-CPT was related to executive control difficulties in girls, whereas unusually slow reaction time was related to the same difficulties in boys. Omission errors were associated with executive difficulties only in boys.

CONCLUSION: The K-CPT may prove to be a useful indicator for early onset of executive control difficulties in preschool-aged children

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J Atten Disord. 2018 Oct;22:1113-22.

USE OF POLYNOMIAL REGRESSION TO INVESTIGATE BIASED SELF-PERCEPTIONS AND ADHD SYMPTOMS IN YOUNG ADOLESCENTS.

Fefer SA, Ogg JA, Dedrick RF.

OBJECTIVE: This study investigated biased self-perceptions of academic and social competence among young adolescents with a range of ADHD symptoms. The goal was to better understand how to measure agreement and disagreement between competence ratings from multiple informants.

METHOD: The commonly used discrepancy methodology was used along with polynomial regression/response surface analyses to explore the relationship between biased self-perceptions and ADHD symptoms. Participants were 164 middle school students and their homeroom teachers. Students and teachers completed measures about academic and social competence, and teachers rated ADHD symptoms.

RESULTS: Discrepancy score and polynomial regression/response surface analyses both supported the relationship between student overestimation of competence and ADHD symptoms. Response surface analyses also suggest that some students with ADHD symptoms accurately perceive their impairments, particularly in the academic domain.

CONCLUSION: Findings demonstrate the importance of using more advanced methods to understand the relationship between both accurate and discrepant perceptions of competence and ADHD symptoms

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J Atten Disord. 2018 Aug;22:911-23.

VARIATION IN PRESENTATION, DIAGNOSIS, AND MANAGEMENT OF CHILDREN AND ADOLESCENTS WITH ADHD ACROSS EUROPEAN COUNTRIES.

Setyawan J, Fridman M, Grebla R, et al.

OBJECTIVE: To characterize differences in presentation, diagnosis, and management of children/adolescents with ADHD in six European countries.

METHOD: Physicians abstracted clinical records for patients aged 6 to 17 years, diagnosed from 2004 to 2007 and treated for >/=2 years. Documentation included impairment due to core ADHD symptoms and additional ADHD symptoms/behaviors at diagnosis, diagnostic approach, and treatment modality.

RESULTS: Study included 779 patients treated by 340 physicians. Prevalence of ADHD subtypes (inattention, hyperactivity/impulsivity, or combined) was similar across countries. Mean scores for core and noncore symptom impairment varied and were highest in Italy and the United Kingdom. Variability was noted in diagnostic approach; 95% of physicians in the Netherlands used Diagnostic and Statistical Manual of Mental Disorders (4th edition) criteria versus 10% in Germany. Differences were reported for initial treatment modality, treatment switching, and physician-reported treatment outcomes.

CONCLUSION: European countries varied in diagnostic approaches and practice management of children/adolescents with ADHD

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J Atten Disord. 2018 Oct;22:1123-30.

RESPONSE PATTERNS TO EMOTIONAL FACES AMONG ADOLESCENTS DIAGNOSED WITH ADHD.

Dan O, Raz S.

OBJECTIVE: The present study investigated differences in emotional face processing between adolescents (age 15-18) with ADHD-Combined type (ADHD-CT) and typically developing controls.

METHOD: Participants completed a visual emotional task in which they were asked to rate the degree of negativity/positivity of four facial expressions (taken from the NimStim face stimulus set).

RESULTS: Participants' ratings, ratings' variability, response times (RTs), and RTs' variability were analyzed. Results showed a significant interaction between group and the type of presented stimuli. Adolescents with ADHD-CT discriminated less between positive and negative emotional expressions compared with those without ADHD. In addition, adolescents with ADHD-CT exhibited greater variability in their RTs and in their ratings of facial expressions when compared with controls.

CONCLUSION: The present results lend further support to the existence of a specific deficit or alteration in the processing of emotional face stimuli among adolescents with ADHD-CT

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J Atten Disord. 2018 May;22:651-60.

CINGULATE CORTICAL THICKNESS AND DOPAMINE TRANSPORTER (DAT1) GENOTYPE IN CHILDREN AND ADOLESCENTS WITH ADHD.

Fernandez-Jaen A, Albert J, Fernandez-Mayoralas DM, et al.

OBJECTIVE: This study aimed to examine the influence of dopamine transporter gene (DAT1) 3'UTR genotype on cingulate cortical thickness in a large sample of children and adolescents with ADHD.

METHOD: Brain MRIs were acquired from 46 ADHD patients with homozygosity for the 10-repeat allele and 52 ADHD patients with a single copy or no copy of the allele. The cingulate cortex of each MRI scan was automatically parceled into sulci and gyri as well as into Brodmann areas (BA).

RESULTS: There were no group differences in age, gender, full-scale intelligence quotient, symptom severity, treatment status, comorbidity, or mean overall cortical thickness. Sulcus/gyrus- and BA-based

analyses revealed that patients homozygous for the 10-repeat allele showed significantly greater thickness in right cingulate gyrus and right BA 24 compared with 9-repeat carriers.
CONCLUSION: These findings suggest that thickness of cingulate cortex is influenced by the presence of the 10-repeat allele in ADHD

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J Atten Disord. 2018 Sep;22:1040-48.
RELIABILITY AND VALIDITY OF THE BEFORE-SCHOOL FUNCTIONING SCALE IN CHILDREN WITH ADHD.
Faraone SV, Hammerness PG, Wilens TE.
OBJECTIVE: Children with ADHD frequently manifest behavioral difficulties in the morning prior to school. We sought to assess the reliability and validity of the Before-School Functioning Questionnaire (BSFQ) as a measure of morning behaviors impaired by ADHD.
METHOD: We used pre-treatment data from a randomized crossover study of 6- to 12-year-old participants comparing the methylphenidate transdermal delivery system (MTS) with a placebo transdermal system (PTS) for a total of 4 weeks.
RESULTS: The BSFQ investigator-rated scale shows very good internal homogeneity (Cronbach's alpha = .91), good test-retest reliability (r = .60), good concurrent validity (r range = .42-.86), and a strong treatment effect (effect size = -.93). The self-rated BSFQ showed lower levels of reliability and validity.
CONCLUSION: The investigator-rated BSFQ should be used in future trials of ADHD medications aimed at assessing efficacy in the morning before school

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J Atten Disord. 2018 Oct;22:1150-57.
POSITIVE BIAS IN TEENAGE DRIVERS WITH ADHD WITHIN A SIMULATED DRIVING TASK.
Fabiano GA, Schatz NK, Hulme KF, et al.
OBJECTIVE: Youth with ADHD exhibit positive bias, an overestimation of ability, relative to external indicators. The positive bias construct is understudied in adolescents, particularly in the domain of driving. Study is needed as youth with ADHD experience greater negative outcomes in driving relative to typically developing teens.
METHOD: Positive bias on a driving simulator task was investigated with 172 teenagers with ADHD, combined type. Youth participated in a driving simulation task and rated driving performance afterward.
RESULTS: Compared with external ratings of driving performance, youth overestimated driving competence for specific driving behaviors as well as globally. The global rating demonstrated a greater degree of positive bias. Greater positive bias on global ratings of driving ability also predicted greater rates of risky driving behaviors during the simulator exercise independent from disruptive behavior disorder symptoms.
CONCLUSION: Results inform prevention and intervention efforts for teenage drivers with ADHD

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J Atten Disord. 2018 Sep;22:1066-73.
RELIABILITY AND VALIDITY OF THE DAILY PARENT RATING OF EVENING AND MORNING BEHAVIOR SCALE, REVISED.
Faraone SV, Childress A, Wigal SB, et al.
OBJECTIVE: Children with ADHD frequently manifest behavioral difficulties in the morning prior to school. We sought to assess the reliability and validity of the Daily Parent Rating of Evening and Morning Behavior Scale, Revised (DPREMB-R) morning score as a measure of morning behaviors impaired by ADHD.
METHOD: We used data from a clinical trial of HLD200 treatment in pediatric participants with ADHD to address our objectives.
RESULTS: The DPREMB-R morning score showed significant internal homogeneity, test-retest reliability (r = .52-.45), and good concurrent validity (r = .50-.71).

CONCLUSION: The DPREMB-R morning score could be a useful instrument for assessing treatment efficacy in the morning before school

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J Atten Disord. 2018 Jun;22:764-75.

THE RELATIONS BETWEEN TEMPERAMENT, CHARACTER, AND EXECUTIVE FUNCTIONS IN CHILDREN WITH ADHD AND CLINICAL CONTROLS.

Drechsler R, Zulauf LM, Walitza S, et al.

OBJECTIVE: The purpose of this study was to investigate the overlap between executive functions and temperament as measured by two questionnaires and to examine characteristic profiles in children with ADHD and clinical controls.

METHOD: Parents of 111 clinically referred children, half of whom were diagnosed with ADHD and half with other or no diagnoses, completed the Behavior Rating Inventory of Executive Function (BRIEF) and the Cloninger Junior Temperament and Character Inventory (JTCI).

RESULTS: Factor analysis of both instruments resulted in three common factors representing aspects of (1) cognitive regulation, (2) behavioral regulation, and (3) anxious/rigid tendencies. Factor (4) represented strengths and positive resources and loaded on JTCI scales only. Both instruments discriminated significantly between ADHD and non-ADHD children. Conduct disorder/oppositional defiant disorder (CD/ODD) but not ADHD accounted for problems in BRIEF Emotional Control and Self-Monitor and JTCI low Cooperativeness.

CONCLUSION: The two instruments only partially overlap and may complement each other

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J Atten Disord. 2018 Aug;22:924-32.

DO HIGH AND LOW EXTREMES OF ADHD AND ASD TRAIT CONTINUA REPRESENT MALADAPTIVE BEHAVIORAL AND COGNITIVE OUTCOMES? A POPULATION-BASED STUDY.

Greven CU, Van Der Meer JMJ, Hartman CA, et al.

OBJECTIVE: Attention deficit hyperactivity disorder (ADHD) and autism spectrum disorders (ASD) are thought to reflect the high, symptomatic extreme of quantitative trait continua. However, extreme deviations in either direction on disorder continua, high and low, may both represent maladaptive behavioral and cognitive outcomes. We aimed to test this hypothesis.

METHOD: In a population sample of 378 children, ADHD and ASD traits were rated by parents on questionnaires that provide resolution at high and low extremes of the ADHD and ASD trait continua. ADHD and ASD traits were related to parent-ratings of internalizing and externalizing behavior problems and tests of cognitive functioning using polynomial regression.

RESULTS: The low ends of the ADHD and ASD trait continua were related to fewer behavior problems and better cognitive functioning than symptomatic ends.

CONCLUSION: Studying the correlates of the low continuum ends may deepen our understanding of the mechanisms underlying adaptive behavioral and cognitive outcomes

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J Atten Disord. 2018 Nov;22:1278-88.

CHILD MALTREATMENT AND ASSOCIATED PARENTAL FACTORS AMONG CHILDREN WITH ADHD: A COMPARATIVE STUDY.

Gul H, Gurkan CK.

OBJECTIVE: This study investigated the role of child and parental factors in maltreatment of children with ADHD compared with a healthy control group.

METHOD: We examined the rates and correlations of child maltreatment by parents in a sample of children with ADHD (n = 100) and a matched comparison sample of children without ADHD (n = 100), all aged 6 to 11 years. Parent and child ratings evaluated demographic characteristics, severity of ADHD symptoms, and childhood trauma exposure.

RESULTS: According to regression analysis, maternal hyperactivity/impulsivity and male gender of the child increase the emotional abuse; whereas maternal history of emotional abuse and physical neglect and paternal attention deficit increase sexual abuse, and higher maternal hyperactivity/impulsivity increases emotional neglect of ADHD children.
CONCLUSION: The study's findings provide strong evidence that the maltreatment of children with ADHD is more associated with parental factors than with the symptoms of ADHD in children

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J Atten Disord. 2018 Jul;22:855-63.
PERINATAL RISK FACTORS AND ADHD IN CHILDREN AND ADOLESCENTS: A HIERARCHICAL STRUCTURE OF DISORDER PREDICTORS.
Hanc T, Szwed A, Slopien A, et al.
OBJECTIVE: The aim of the study was to hierarchically assess the predictive power of low and high birth weight, pre-term and post-term birth, and low Apgar score as the risk factors for ADHD.
METHOD: The data of 132 boys diagnosed with ADHD and 146 boys from control group, aged 6 to 18 years, have been analyzed. The boys were categorized according to term of birth, birth weight, and Apgar score. CART method (Classification and Regression Trees) was used for assessment of the relationship between perinatal factors and the risk of ADHD.
RESULTS: Low Apgar score (21.97% vs. 13.01%) and post-term birth (12.12% vs. 0.68%) were more frequent in the sample than in the control group. CART method additionally indicated low birth weight as associated with the risk of ADHD. Among analyzed risk factors, Apgar score had the highest predictive value.
CONCLUSION: The decreased Apgar score is the most important perinatal risk factor of ADHD. Research results also indicated a high significance of post-term birth in predicting the disorder

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J Atten Disord. 2018 Nov;22:1224-34.
TESTING THE SIMILARITY FIT/MISFIT HYPOTHESIS IN ADOLESCENTS AND PARENTS WITH ADHD.
Grimbos T, Wiener J.
OBJECTIVE: Higher rates of conflict are observed between adolescents with ADHD and their parents due to cognitive, academic, social, and behavioral difficulties. Conflict should be even more pronounced when parents have ADHD themselves; however, some research suggests that parents with ADHD may have increased tolerance toward children who share similar challenges (i.e., similarity-fit hypothesis).
METHOD: We tested the similarity-fit model and its converse, the similarity-misfit model, in a sample of 93 ADHD adolescents, 63 comparison adolescents, and their parents with varying levels of ADHD. Quantity and intensity of conflict were examined in mothers and fathers separately.
RESULTS: We found evidence for the similarity-fit process in fathers, and similarity misfit in mothers, particularly regarding quantity of conflict between parent and adolescent.
CONCLUSION: Results indicate the importance of differential parental roles in mothers and fathers, and have implications for involving parents in treatment for ADHD in adolescents

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J Atten Disord. 2018 Aug;22:994-1001.
EXPLICIT AND IMPLICIT POSITIVE ILLUSORY BIAS IN CHILDREN WITH ADHD.
Emeh CC, Mikami AY, Teachman BA.
OBJECTIVE: Children with ADHD overestimate their own social and behavioral competence when using explicit self-report measures, a phenomenon known as Positive Illusory Bias (PIB). This study examined whether children with ADHD show PIB when self-perceptions are measured implicitly, reflecting associations that are relatively difficult to consciously control.
METHOD: Participants were 23 children (ages 6.8-9.8) with ADHD and 55 typically developing (TD) children. Children's explicit self-perceptions of competence were measured via self-report on the Self-Perception Profile for Children; their implicit associations were assessed using an Implicit Association Test. Parent and

teacher ratings formed an adult-reported composite indicator of children's competence, to which children's self-perceptions were compared.
RESULTS: Children with ADHD overestimated their competence as compared with adult-informant reports on both explicit and implicit measures, whereas TD children tended to be accurate.
CONCLUSION: Inflated self-perceptions in children with ADHD may exist on an implicit level outside of conscious awareness

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J Atten Disord. 2018 Jun;22:752-63.
WHERE CHILDREN WITH ADHD DIRECT VISUAL ATTENTION DURING EMOTION KNOWLEDGE TASKS: RELATIONSHIPS TO ACCURACY, RESPONSE TIME, AND ADHD SYMPTOMS.
Serrano VJ, Owens JS, Hallowell B.
OBJECTIVE: Inattention may contribute to emotion recognition deficits in children with ADHD. In the current study, we compared the viewing patterns for emotion stimuli between children with and without ADHD and examined the relationship between viewing patterns, emotion knowledge accuracy, response time, and ADHD symptoms.
METHOD: Eye-tracking technology recorded viewing patterns for emotion stimuli among 45 children (60% male; control n = 26, ADHD n = 19).
RESULTS: Overall, viewing patterns of children with and without ADHD were strikingly similar; however, small to large effect sizes (Cohen's d = -0.73 to 0.93) across emotions suggest that, for some emotions, children with ADHD spend less time viewing relevant areas of images and take longer to respond (i.e., detect an emotion) compared with children without ADHD.
CONCLUSION: Children with ADHD view some emotions differently from children without ADHD. The results provide an important foundation for additional work in this area

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J Atten Disord. 2018 Jul;22:886-95.
INTERACTION BETWEEN SEASON OF BIRTH AND COMT VAL158MET (RS4680) IN ADHD IN A LARGE SAMPLE OF CHINESE HAN PARTICIPANTS.
Gao Q, Liu L, Li HM, et al.
OBJECTIVE: To investigate the interaction between catechol-O-methyltransferase gene (COMT) Val108/158Met (rs4680) and season of birth (SOB) on ADHD and its symptoms.
METHOD: We conducted transmission disequilibrium tests (TDTs) in 976 trios, then further performed the above analyses in subgroups according to SOB. Quantitative analyses were performed for ADHD symptoms evaluated by ADHD Rating Scale-IV in 1,530 ADHD cases.
RESULTS: Overall, there was no association between COMT and ADHD. After stratification, we found an increased transmission of the Val allele in the trios born in spring, while a decreased transmission was observed in the autumn months. We also observed a significant interaction between Val108/158Met and SOB on ADHD symptoms. Among those born in spring, Met carriers had milder ADHD symptoms compared with Val homozygotes, whereas opposite association was found in those born in autumn.
CONCLUSION: Our study provided evidence for the modifying effect of SOB on the association between COMT and ADHD along with its symptoms

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J Atten Disord. 2018 Jun;22:712-23.
SOCIAL SUPPORT IN CHILDREN WITH ADHD: AN EXPLORATION OF RESILIENCE.
Mastoras SM, Saklofske DH, Schwean VL, et al.
OBJECTIVE: This study investigated the role of perceived social support in promoting emotional well-being among children with ADHD. Specifically, it examined how children with ADHD perceive support from key individuals in their lives and the relationships between this support and aspects of emotional well-being. Main versus buffering models of social support in the context of social preference status were also explored.

METHOD: Participants were 55 school-age children with ADHD-combined or hyperactive/impulsive (ADHD-C/HI). Parent and child ratings evaluated source-specific social support, social status, and aspects of self-concept, anxiety, and depression.
RESULTS: Children with ADHD reported lower social support than normative samples. Social support had moderate positive associations with self-concept, with source-specific differences, but was not associated with internalizing symptoms. Regression models with social preference status supported a main effect model of perceived social support.
CONCLUSION: Social support may provide a target for resilience-based interventions among children with ADHD in promoting their self-concept and well-being

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J Atten Disord. 2018 May;22:639-50.
ALTERATIONS IN THE VENTRAL ATTENTION NETWORK DURING THE STOP-SIGNAL TASK IN CHILDREN WITH ADHD: AN EVENT-RELATED POTENTIAL SOURCE IMAGING STUDY.
Janssen TWP, Heslenfeld DJ, van MR, et al.
OBJECTIVE: Deficits in response inhibition figure prominently in models of ADHD; however, attentional deficiencies may better explain previous findings of impaired response inhibition in ADHD. We tested this hypothesis at the neurophysiological level.
METHOD: Dense array ERPs (event-related potentials) were obtained for 46 children with ADHD and 51 controls using the stop-signal task (SST). Early and late components were compared between groups. N2 and P3 components were localized with LAURA distributed linear inverse solution.
RESULTS: A success-related N1 modulation was only apparent in the ADHD group. N2 and P3 amplitudes were reduced in ADHD. During the successful inhibition N2, the ADHD group showed reduced activation in right inferior frontal gyrus (rIFG), supplementary motor area (SMA), and right temporoparietal junction (rTPJ), and during failed inhibition in the rIFG. During the successful inhibition P3, reduced activation was found in anterior cingulate cortex (ACC) and SMA.
CONCLUSION: Impairments in the ventral attention network contribute to the psychopathology of ADHD and challenge the dominant view that ADHD is underpinned by impaired inhibitory control

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J Atten Disord. 2018 Jul;22:38S-48S.
TURNING POINTS IN THE LIVES OF YOUTH OF WITH/WITHOUT ADHD: ARE THEY LINKED TO CHANGES IN SUBSTANCE USE?
Jensen PS, Yuki K, Murray D, et al.
OBJECTIVE: This study examines the behavior beliefs, social supports, and turning points in individuals with/without ADHD related to their substance use/abuse (SU/A) decisions.
METHOD: The coded interviews from 60 participants with/without ADHD were compared for their SU/A decisions and precipitants with these decisions among abstainers, persisters, and desisters.
RESULTS: ADHD participants reported fewer social advantages to avoid SU/A than non-ADHD participants. Desisters and persisters reported more social advantages of using drugs than abstainers. Persisters reported both more negative and positive psychological/physiological effects of SU/A. ADHD participants reported fewer positive role models in their lives. Non-ADHD patients reported more positive turning points than ADHD participants, regardless of SU/A status.
CONCLUSION: ADHD individuals face challenges in making healthy decisions about SU/A due to lack of positive role models. Reinforcing accurate behavioral beliefs may be important to change behaviors in individuals with SU/A or to prevent SU/A initiation in ADHD individuals

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J Atten Disord. 2018 Jul;22:49S-60S.

How Substance Users With ADHD Perceive the Relationship Between Substance Use and Emotional Functioning.

Mitchell JT, Weisner TS, Jensen PS, et al.

OBJECTIVE: Although substance use (SU) is elevated in ADHD and both are associated with disrupted emotional functioning, little is known about how emotions and SU interact in ADHD. We used a mixed qualitative-quantitative approach to explore this relationship.

METHOD: Narrative comments were coded for 67 persistent (50 ADHD, 17 local normative comparison group [LNCG]) and 25 desistent (20 ADHD, 5 LNCG) substance users from the Multimodal Treatment Study of Children with ADHD (MTA) adult follow-up (21.7-26.7 years-old).

RESULTS: SU persisters perceived SU positively affects emotional states and positive emotional effects outweigh negative effects. No ADHD group effects emerged. Qualitative analysis identified perceptions that cannabis enhanced positive mood for ADHD and LNCG SU persisters, and improved negative mood and ADHD for ADHD SU persisters.

CONCLUSION: Perceptions about SU broadly and mood do not differentiate ADHD and non-ADHD SU persisters. However, perceptions that cannabis is therapeutic may inform ADHD-related risk for cannabis use

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J Atten Disord. 2018 Sep;22:1074-80.

ADHD and the QbTest: Diagnostic Validity of QbTest.

Hult N, Kadesjo J, Kadesjo B, et al.

OBJECTIVE: We assess the diagnostic accuracy of the QbTest, which measures the cardinal symptoms of ADHD.

METHOD: The study group comprised 182 children (mean age about 10 years), of whom 124 had ADHD and 58 had other clinical diagnosis of which 81% had ASD.

RESULTS: Only QbTest parameters for inattention and hyperactivity differentiated between ADHD and other clinical diagnoses at the p </= .01 level, not for measures of impulsivity. Sensitivity ranged from 47% to 67% and specificity from 72% to 84%. Positive predictive value ranged from 41% to 86%, and negative predictive value from 43% to 86%. Area under the curve varied from .70 to .80.

CONCLUSION: The ability of the individual QbTest parameters to identify ADHD was moderate. The test's ability to discriminate between ADHD subtypes was unsatisfactory

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J Atten Disord. 2018 Nov;22:1187-99.

Paternal Antisocial Behavior (But Not Paternal ADHD) Is Associated With Negative Parenting and Child Conduct Problems.

LeMoine KA, Romirowsky AM, Woods KE, et al.

OBJECTIVE: Parental psychopathology and parenting quality robustly predict negative outcomes among children with ADHD. Little research has investigated associations between paternal ADHD symptoms and parenting, though there is clear evidence linking maternal ADHD symptoms with both suboptimal parenting and child conduct problems, and considerable research supporting fathers' significant contributions to their children's development.

METHOD: This cross-sectional study examined psychopathology and parenting in a sample of fathers (N = 102) and their 5- to 12-year-old children with previously diagnosed ADHD.

RESULTS: Results suggested that paternal antisocial personality disorder (ASPD) symptoms (rather than ADHD symptoms) were robustly associated with child conduct problems, with an indirect effect through paternal negative parenting.

CONCLUSION: This study suggests that negative parenting may be a potential mechanism by which paternal ASPD is associated with child conduct problems, and demonstrates the importance of considering co-occurring psychopathology in research examining adult ADHD, parenting, and child outcomes

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J Atten Disord. 2018 May;22:694-702.

REWARD PROCESSING DEFICITS DURING A SPATIAL ATTENTION TASK IN PATIENTS WITH ADHD: AN FMRI STUDY.

Metin B, Tas ZC, Cebi M, et al.

OBJECTIVE: In this study, we aimed to explore how cues signaling rewards and feedbacks about rewards are processed in ADHD.

METHOD: Inside the scanner, 16 healthy children and 19 children with ADHD completed a spatial attention paradigm where cues informed about the availability of reward and feedbacks were provided about the earned reward.

RESULTS: In ventral anterior thalamus (VA), the controls exhibited greater activation in response to reward-predicting cues, as compared with no-reward cues, whereby in the ADHD group, the reverse pattern was observed (nonreward > reward). For feedbacks; absence of rewards produced greater activation than presence in the left caudate and frontal eye field for the control group, whereas for the ADHD group, the reverse pattern was again observed (reward > nonreward).

DISCUSSION: The present findings indicate that ADHD is associated with difficulty integrating reward contingency information with the orienting and regulatory phases of attention

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J Atten Disord. 2018 Jul;22:896-900.

PLASMA LEPTIN, ADIPONECTIN, NEUROPEPTIDE Y LEVELS IN DRUG NAIVE CHILDREN WITH ADHD.

Ozcan O, Arslan M, Gungor S, et al.

OBJECTIVE: ADHD is one of the most common childhood psychiatric disorders. Research indicates that there is some link between obesity/overweight and ADHD, though the mechanism of this association remains uncertain. It is the aim of the present study to explore the association between ADHD, obesity, and plasma leptin, neuropeptide Y (NPY), and adiponectin levels.

METHOD: Thirty-six patients diagnosed with ADHD were included in the study. The control group consisted of 40 healthy children and adolescents who had similar age and gender features with the patient group. Plasma leptin, adiponectin, NPY levels were measured, and body mass index (BMI), weight for height, and standard deviation scores (SDS) of height, weight, and BMI were calculated.

RESULTS: No significant difference was found between patients and healthy children in terms of BMI and BMI percentile. Participants were classified into three groups according to their weight to height values. There was no significant difference between the two groups, but 10% of the control group and 30.6% of the ADHD group were classified as overweight, which was 3 times higher than the control group. The adiponectin plasma level was significantly lower and leptin/adiponectin (L/A) ratio was significantly higher in the ADHD group. There was no significant difference between serum NPY levels. In the ADHD group, the mean leptin plasma level was high, but was not statistically significant.

CONCLUSION: We think that a low adiponectin level and high L/A ratio may be the underlying mechanism of the obesity in ADHD patients

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J Atten Disord. 2018 Jun;22:787-95.

EMOTIONAL LABILITY IN PRESCHOOLERS WITH SYMPTOMS OF ADHD.

Overgaard KR, Oerbeck B, Aase H, et al.

OBJECTIVE: The aim of this study was to examine occurrence of emotional lability (EL) in preschoolers with ADHD symptoms versus controls.

METHOD: The study was part of the Norwegian Mother and Child Cohort Study (MoBa) at the Norwegian Institute of Public Health. In the present study, 495 preschoolers were clinically examined. Symptoms of

ADHD, anxiety, and oppositional defiant disorder (ODD) were measured with the Preschool Age Psychiatric Assessment Interview. An EL measure was obtained from the Emotional Control subscale of the Behavior Rating Inventory of Executive Function-Preschool Version (BRIEF-P), which parents and teachers completed.
RESULTS: EL was significantly more frequent in the ADHD group compared with controls (25% vs. 7%, $p < .001$). By parent report, EL correlated significantly with ADHD-, anxiety-, and ODD symptoms. By teacher report, EL was significantly correlated only with hyperactivity-impulsivity.
CONCLUSION: EL appears identifiable in young preschoolers and was particularly associated with ODD in children with ADHD symptoms

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J Atten Disord. 2018 May;22:619-26.
RETINAL NERVE FIBER LAYER THICKNESS IN CHILDREN WITH ADHD.
Herguner A, Alpfidan I, Yar A, et al.
OBJECTIVES: The current study aims to compare retinal nerve fiber layer (RNFL) thickness, macular thickness, and macular volume between children with ADHD and a control group.
METHOD: The study group included children with ADHD and the control group consisted of age- and gender-matched participants without any psychiatric disorder. In all participants, RNFL thickness, macular thickness, and macular volume were measured by using spectral domain-optical coherence tomography (SD-OCT). ADHD symptom severity was evaluated by using parent-report measures, including Conners' Parent Rating Scale-Revised: Short Form (CPRS-R: S) and the Strengths and Difficulties Questionnaire: Parent Form (SDQ: P).
RESULTS: We compared 90 eyes of 45 children with ADHD and 90 eyes of 45 controls. ADHD group had significantly lower RNFL thickness only in nasal quadrant than the controls. The remaining RNFL quadrants, macular thickness, and volume were not significantly different between groups. There was a reverse correlation between RNFL thickness and ADHD symptom severity.
CONCLUSION: This is the first study examining the RNFL thickness in ADHD. Our findings showed that nasal RNFL thickness was lower, indicating reduced unmyelinated axons in the retina of children with ADHD. The results of this study support the evidence that ADHD involves a lag in cortical maturation and this is measurable in the retina

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J Atten Disord. 2018 May;22:661-70.
THE CORRELATION BETWEEN COGNITIVE AND MOVEMENT SHIFTING AND BRAIN ACTIVITY IN CHILDREN WITH ADHD.
Kang KD, Han DH, Kim SM, et al.
OBJECTIVE: We assessed the correlation between the deficits of cognition, movement, and brain activity in children with Attention Deficit Hyperactvity Disorder (ADHD).
METHOD: We recruited 15 children with ADHD and 15 age- and sex-matched healthy control participants. Clinical symptoms, cognitive shifting, movement shifting, and brain activity were assessed using the Korean ADHD Rating Scale, the Wisconsin Card Sorting Test (WCST), the 7- and 14-ring drill test with hop jumps (7 HJ and 14 HJ), and 3.0 Tesla functional magnetic resonance imaging scanner, respectively.
RESULTS: ADHD children showed an increased distance traveled and decreased speed on the 14 HJ task. In response to the WCST task, ADHD children showed decreased activation within right gyrus. Total distance on the 14 HJ task was negatively correlated with the mean beta value of Cluster 2 in ADHD children.
CONCLUSION: These results suggested that children with ADHD showed difficulty with attention shifting as well as with movement shifting

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J Atten Disord. 2018 Oct;22:1109-12.

NEGATIVE CONSEQUENCES OF POOR DRIVING OUTCOMES REPORTED BY ADOLESCENTS WITH AND WITHOUT ADHD.

Narad ME, Garner AA, Antonini TN, et al.

OBJECTIVE: Although adolescents with ADHD report less driving experience, a greater proportion of adolescents with ADHD report receiving at least one ticket; however, no study has examined the severity of infractions committed by adolescent drivers with ADHD.

METHOD: A total of 61 adolescents (28 ADHD, 33 controls) aged 16 to 17 with a valid driver's license completed a self-report Driving History Questionnaire (DHQ), which asked about months of driving experience, negative driving outcomes, and severity of consequences.

RESULTS: A greater proportion of adolescents with ADHD reported receiving fines, points on their driver's license, and remedial driving class. Furthermore, adolescents with ADHD reported attending a greater number of hours in remedial driving class, and a greater expense associated with fines.

CONCLUSION: Importantly, ADHD-related negative driving outcomes manifest early in driving careers. Furthermore, increased negative consequences of poor and/or risky driving among adolescents with ADHD were evident despite having fewer months of independent driving

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J Atten Disord. 2018 Jul;22:827-38.

ADHD SYMPTOMS IN A NON-REFERRED LOW BIRTHWEIGHT/PRETERM COHORT: LONGITUDINAL PROFILES, OUTCOMES, AND ASSOCIATED FEATURES.

Krasner AJ, Turner JB, Feldman JF, et al.

OBJECTIVE: This study's objective is to differentiate possible ADHD syndromes on the basis of symptom trajectories, prognosis, and associated clinical features in a high-risk cohort.

METHOD: Latent class analysis of inattentive (IA) and hyperactive-impulsive (HI) symptoms in 387 non-disabled members of a regional low birthweight/preterm birth cohort who were evaluated for ADHD at 6, 9, and 16 years. Adolescent functional outcomes and other clinical features were examined across the classes.

RESULTS: Three latent classes were identified: unaffected (modest IA and HI symptom prevalences at six, remitting by nine), school age limited (relatively high IA and HI symptom prevalences at six and nine, declining by 16), and persistent inattentive (high IA and HI prevalences at six and nine, with high IA levels persisting to 16). The persistent inattentive class was distinctively associated with poor functioning, motor problems, other psychiatric disorders, and social difficulties as indexed by a positive screen for autism spectrum disorder at 16.

CONCLUSION: These findings differentiate a potential persistent inattentive syndrome relevant to ADHD evaluation and treatment

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J Atten Disord. 2018 Nov;22:1207-17.

HOW GOOD AM I? IMPLICIT AND EXPLICIT SELF-ESTEEM AS A FUNCTION OF PERCEIVED PARENTING STYLES AMONG CHILDREN WITH ADHD.

Kurman J, Rothschild-Yakar L, Angel R, et al.

OBJECTIVE: To investigate implicit and explicit self-esteem and academic self-evaluation among children with ADHD as a function of parenting styles, namely, authoritarian, authoritative and permissive parenting.

METHOD: Participants included 43 children with ADHD and 35 non-ADHD controls who filled out self-concept and perceived parenting style questionnaires. They also took an Implicit Association Test (IAT) that measured unacknowledged self-esteem.

RESULTS: Lower self-esteem was found among children with ADHD than among controls, with stronger effect on the implicit level. Perceived authoritarian parenting was related to lower implicit self-esteem among children with ADHD. Higher self-esteem was found in the authoritative than in the permissive parenting groups in the non-ADHD control group but not among children with ADHD.

CONCLUSION: The role of parental support versus authoritarian parenting in terms of implicit self-esteem points to the importance of promoting responsiveness strategies among parents in the treatment of children with ADHD

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J Atten Disord. 2018 Jun;22:806-12.

MULTIMODAL THERAPY INVOLVING HIGH-INTENSITY INTERVAL TRAINING IMPROVES THE PHYSICAL FITNESS, MOTOR SKILLS, SOCIAL BEHAVIOR, AND QUALITY OF LIFE OF BOYS WITH ADHD: A RANDOMIZED CONTROLLED STUDY.

Messler CF, Holmberg HC, Sperlich B.

OBJECTIVE: To compare the effects of multimodal therapy including supervised high-intensity interval training (HIIT) with those of standard multimodal therapy (TRAD) concerning key variables of physical fitness (peak power and oxygen uptake), motor skills, social behavior, and quality of life in boys with ADHD.

METHOD: A single-center, two-arm randomized, controlled design was used, with 28 boys (8-13 years of age, IQ = 83-136) being randomly assigned to multimodal HIIT (three sessions/week, 4 x 4-min intervals at 95% of peak heart rate) or TRAD. The Movement Assessment Battery for Children II evaluated motor skills and the German version of the hyperkinetic disorder questionnaire for external evaluation by the guardians (FBB-HKS) or German version of the hyperkinetic disorder questionnaire for self-assessment by the children (SBB-HKS) and the KINDL-R questionnaires mental health and health-related quality of life.

RESULTS: Both interventions enhanced peak power, and HIIT also reduced submaximal oxygen uptake. HIIT was more effective than TRAD in improving the total score for motor skills (including manual dexterity and ball skills; $p < .05$), self-esteem, friends, and competence ($p < .05$) and, moreover, improved subjective ratings of attention.

CONCLUSION: Three weeks of multimodal therapy including HIIT improved physical fitness, motor skills, certain aspects of quality of life, competence, and attention in boys with ADHD

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J Atten Disord. 2018 Jul;22:21S-37S.

THE QUALITATIVE INTERVIEW STUDY OF PERSISTENT AND NONPERSISTENT SUBSTANCE USE IN THE MTA: SAMPLE CHARACTERISTICS, FREQUENT USE, AND REASONS FOR USE.

Swanson JM, Wigal T, Jensen PS, et al.

OBJECTIVE: To evaluate participants' perceptions about frequent use and reasons for substance use (SU) in the qualitative interview study, an add-on to the multimodal treatment study of ADHD (MTA).

METHOD: Using the longitudinal MTA database, 39 ADHD cases and 19 peers with Persistent SU, and 86 ADHD cases and 39 peers without Persistent SU were identified and recruited. In adulthood, an open-ended interview was administered, and SU excerpts were indexed and classified to create subtopics (frequent use and reasons for use of alcohol, marijuana, and other drugs).

RESULTS: For marijuana, the Persistent compared with Nonpersistent SU group had a significantly higher percentage of participants describing frequent use and giving reasons for use, and the ADHD group compared with the group of peers had a significantly higher percentage giving "stability" as a reason for use.

CONCLUSION: Motivations for persistent marijuana use may differ for adults with and without a history of ADHD

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J Atten Disord. 2018 Aug;22:971-83.

POLYUNSATURATED FATTY ACIDS ARE ASSOCIATED WITH BEHAVIOR BUT NOT WITH COGNITION IN CHILDREN WITH AND WITHOUT ADHD: AN ITALIAN STUDY.

Crippa A, Agostoni C, Mauri M, et al.

OBJECTIVE: This study aimed to investigate the relationship between polyunsaturated fatty acids (PUFAs) status, cognitive, and behavioral traits of ADHD in school-aged children.

METHOD: Seventy-three children with and without ADHD were assessed with cognitive tasks and behavioral rating scales including quality of life and global functioning at baseline of an intervention trial (clinicaltrials.gov

NCT01796262). Correlation analyses were performed between the cognitive tasks/behavioral ratings and blood PUFA levels.
RESULTS: Children with ADHD had lower levels of DHA, omega-3 index, and total PUFA. PUFAs were positively associated with behavior but not consistently related to cognitive domains.
CONCLUSION: The present study confirms that children with ADHD display abnormal fatty acid profiles within an Italian setting. Furthermore, PUFAs were associated with behavior but not with cognition. Accordingly, for the first time, lower blood levels of PUFA were associated not only with symptoms of ADHD but also with a poorer quality of life

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J Atten Disord. 2018 May;22:611-18.
GRAY MATTER INCREASE IN MOTOR CORTEX IN PEDIATRIC ADHD: A VOXEL-BASED MORPHOMETRY STUDY.
Sutcubasi KB, Metin B, Tas ZC, et al.
OBJECTIVE: Several studies report that ADHD is associated with reduced gray matter (GM), whereas others report no differences in GM volume between ADHD patients and controls, and some even report more GM volume in individuals with ADHD. These conflicting findings suggest that reduced GM is not a universal finding in ADHD, and that more research is needed to delineate with greater accuracy the range of GM alterations.
METHOD: The present study aimed to identify GM alterations in ADHD using pediatric templates. 19 drug-naive ADHD patients and 18 controls, all aged 7 to 14 years, were scanned using magnetic resonance imaging.
RESULTS: Relative to the controls, the ADHD patients had more GM, predominantly in the precentral and supplementary motor areas. Moreover, there were positive correlations between GM volume in these areas and ADHD scale scores.
CONCLUSION: The clinical and pathophysiological significance of increased GM in the motor areas remains to be elucidated by additional research

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J Atten Disord. 2018 Aug;22:947-58.
EXPLORING BEHAVIORAL SLEEP PROBLEMS IN CHILDREN WITH ADHD AND COMORBID AUTISM SPECTRUM DISORDER.
Thomas S, Lycett K, Papadopoulos N, et al.
OBJECTIVE: This study (a) compared behavioral sleep problems in children with comorbid ADHD and autism spectrum disorder (ASD) with those with ADHD and (b) examined child/family factors associated with sleep problems.
METHOD: Cross-sectional study comparison of 392 children with a confirmed ADHD diagnosis (ADHD+ASD, n=93, ADHD, n=299) recruited from 21 peadiatric practises in Victoria, Australia. Data were collected from parents. Key measures included the Child Sleep Habits Questionnaire (CSHQ).
RESULTS: Children with ADHD + ASD experienced similar levels and types of behavioral sleep problems compared with those with ADHD. In both groups, the presence of co-occurring internalizing and externalizing comorbidities was associated with sleep problems. Sleep problems were also associated with parent age in the ADHD + ASD group and poorer parent mental health in the ADHD group.
CONCLUSION: Findings suggest comorbid ASD is not associated with increased behavioral sleep problems in children with ADHD and that co-occurring internalizing and externalizing comorbidities may flag children in these groups with sleep problems

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J Atten Disord. 2018 Sep;22:1081-91.

EFFICACY OF A CONTINUOUS PERFORMANCE TEST BASED ON VIRTUAL REALITY IN THE DIAGNOSIS OF ADHD AND ITS CLINICAL PRESENTATIONS.

Areces D, Rodriguez C, Garcia T, et al.

OBJECTIVE: To analyze the diagnostic effectiveness of the AULA Nesplora test to discriminate the different ADHD presentations: impulsive/hyperactive (I/H), inattentive, and combined.

METHOD: A total of 117 students (76.9% male and 23.1% female) between 5 and 16 years of age (M = 11.18 years, SD = 3.10 years) participated, and were divided into three groups with ADHD according to their presentation, and a control group.

RESULTS: Each of the test conditions allowed the discrimination between the I/H and combined presentations with respect to the control group, and between the I/H and inattentive presentations. However, differences among ADHD presentations were only evident when the results were separately analyzed for the visual and auditory modalities.

CONCLUSION: This study showed that the indicators offered by the AULA Nesplora test (omissions, commissions, response times, and motor activity) make it possible to establish a differential diagnosis of ADHD presentations when analyzed under different contextual conditions

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J Atten Disord. 2018 Aug;22:933-41.

SLEEP AND ATTENTION IN CHILDREN WITH ADHD AND TYPICALLY DEVELOPING PEERS.

Waldon J, Vriend J, Davidson F, et al.

OBJECTIVE: The objective of this study was to examine the relationships between sleep and attention in both typically developing (TD) children and children with ADHD.

METHOD: The current study examined sleep and attention in 50 children, from 6 to 12 years of age (25 ADHD, 25 TD). Attention was measured using the Conners' Parent Rating Scale-Revised: Long Version and the Attention Network Test-Interaction (ANT-I), which provided an objective measure of alerting, orienting, and executive attention. Sleep was objectively measured using actigraphy.

RESULTS: Children with ADHD had poorer alerting and executive attention on the ANT-I, as well as poorer parent-reported attention. In addition, poor sleep predicted performance on alerting attention for children with ADHD and TD children, whereas the interaction between poor sleep and ADHD diagnosis predicted executive attention scores.

CONCLUSION: The findings of the current study highlight the importance of ensuring children are getting good quality sleep to optimize attention, particularly for children with ADHD

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J Atten Disord. 2018 May;22:671-78.

AMYGDALA ABNORMALITIES IN ADULTS WITH ADHD.

Tajima-Pozo K, Yus M, Ruiz-Manrique G, et al.

OBJECTIVE: The suggested neurobiological bases of ADHD focus on the amygdala as a center of emotions processing. Therefore, we hypothesize that patients with ADHD will show an irregular pattern of emotional-related activity of the amygdala region as well as some structural abnormalities.

METHOD: Nine adult patients with ADHD and nine group-matched healthy volunteers were studied using a 1.5-T magnetic resonance imaging (MRI) scanner. Morphometric measurements were obtained manually, and they were later processed and compared. Absolute volumes of several structures and nuclei were calculated with FSL-FIRST. For the functional magnetic resonance examination, a set of two paradigms was prepared, using a block design, incorporating images of the International Affective Picture System (IAPS). The patients were unmedicated at the time of the MRI scan.

RESULTS: Negative correlation was found between the right amygdala volume and Barrat's impulsivity scores (r = -.756, p = .018). The age of patients did not turn out to be a significant factor. No significantly higher activation areas were found in patients with unpleasant content images. For the left amygdala, an Region Of Interest (ROI)-based analysis showed moderately higher level of activation in the patients than in the controls with pleasant content images.

CONCLUSION: Patients with ADHD tend to have smaller amygdala volumes. ADHD patients presented less activation in the area of the left frontal pole than the controls. There was no amygdala activation stated when presenting the pleasant images. Whereas bigger activation of the left amygdala was found in patients while presenting them unpleasant images. These results might suggest that lower emotional processing and less control of impulsivity is associated with dysfunctional amygdala in ADHD patients

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J Atten Disord. 2018 Nov;22:1235-45.

THE RELATIONSHIP BETWEEN PARENTAL AFFECTIVE TEMPERAMENT TRAITS AND DISRUPTIVE BEHAVIOR DISORDERS SYMPTOMS IN CHILDREN WITH ADHD.

Bilgic A, Yilmaz S, Ozcan O, et al.

OBJECTIVE: This study investigated the relationship between parental affective temperaments and the oppositional defiant disorder (ODD) and conduct disorder (CD) symptoms of children with ADHD.

METHOD: The sample consisted of 542 treatment-naive children with ADHD and their biological parents. Children were assessed via both parent- and teacher-rated behavioral disorder scales. Parental affective temperament and ADHD symptoms were measured by self-report inventories. The relationships between psychiatric variables were evaluated using structural equation modeling.

RESULTS: According to parent-rated behavioral disorder scales, paternal cyclothymic and maternal irritable temperaments were associated with ODD scores, and maternal depressive temperament was associated with CD scores. In terms of teacher-rated behavioral disorder scales, maternal anxious temperament was associated with ODD scores, and paternal cyclothymic and maternal depressive temperaments were associated with CD scores.

CONCLUSION: These results suggest that certain parental affective temperaments are related to an increase in symptoms of disruptive behavioral disorders in children with ADHD

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J Atten Disord. 2018 Oct;22:1140-49.

LEARNING PROCESS DURING RISK DETECTION IN ADOLESCENTS WITH ADHD.

Medrano E, Flores-Lazaro JC, Nicolini H.

OBJECTIVE: To evaluate and describe the performance during the learning process of risk-detection versus risk-benefit processing in adolescents diagnosed with ADHD.

METHOD: Thirty-five adolescents with ADHD and 26 paired controls participated. The tests applied are Iowa-type children version paradigm and Stroop test.

RESULTS: Adolescents with ADHD exhibited lower risk-benefit processing capacity and lower ability to detect risk selections; main findings also indicate that adolescents with ADHD were slower to learn to avoid risk choices. In addition, they also presented a deficient inhibitory control.

CONCLUSION: Results confirm the presence of a deficit in advantageous choice in adolescents with ADHD. By providing a measure of risk choice-and not only a net score-we show that adolescents with ADHD also fail to avoid risk choices. This deficit is mainly because they are slower in learning how to avoid risk choices, and not simply deficient. Literature is scarce concerning studies with Iowa-type paradigms in samples intregated exclusively by adolescents. More research is needed to clarify the nature of these deficiencies

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J Atten Disord. 2018 Nov;22:1255-65.

EXPLORING PARENT BELIEFS AND BEHAVIOR: THE CONTRIBUTION OF ADHD SYMPTOMOLOGY WITHIN MOTHERS AND FATHERS.

Lowry LS, Schatz NK, Fabiano GA.

OBJECTIVE: To use a multi-method approach to examine the association of parental ADHD and gender with observed and self-reported parenting beliefs and behaviors.

METHOD: Seventy-nine mother-father dyads completed measures of child behavior and impairment, parenting beliefs and behaviors, and self- and partner ratings of ADHD symptoms and functional impairment. Forty-five parents also completed structured parent-child interactions.
RESULTS: A hierarchical linear model suggests impairment in functional domains may be associated with negative emotions about parenting and less effective parenting strategies. For fathers, greater severity of partner-reported symptoms of ADHD may be associated with greater frequency of negative talk during parent-child interactions.
CONCLUSION: Findings suggest that higher levels of parental ADHD symptoms and functional impairment may be associated with reported beliefs and behaviors related to parenting. Differences emerged among mothers' and fathers' use of parenting strategies when self- and other-report of ADHD symptoms and impairment were assessed

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J Atten Disord. 2018 Jul;22:878-85.
DEFICIENCY OF SUSTAINED ATTENTION IN ADHD AND ITS POTENTIAL GENETIC CONTRIBUTOR MAOA.
Liu L, Cheng J, Su Y, et al.
OBJECTIVE: To investigate the genetic contributors to ADHD sustained attention deficit among noradrenergic genes responsible for the synthesis (dopamine-beta-hydroxylase gene, DBH), transport (norepinephrine transporter gene, NET1), reception (alpha-2A adrenergic receptor gene, ADRA2A), and metabolism (monoamine oxidase A gene, MAOA) of noradrenalin (NE).
METHOD: A total of 456 children with ADHD and 108 normal controls were included in a digit cancellation test (DCT). DNA was collected from 242 participants and genotyped for 14 single nucleotide polymorphisms (SNPs) of noradrenergic genes.
RESULTS: Compared with normal controls, children with ADHD showed a lower total score and higher mean error rate in the DCT, indicating poorer sustained attention function. Analysis of covariance showed an association between MAOA genotypes and ADHD performance in DCT, with poorer performance in risk allele carriers. No association was found for other noradrenergic genes.
CONCLUSION: Children with ADHD presented with a sustained attention deficit compared with normal controls. The sustained attention deficit of children with ADHD may be associated with genetic variant of MAOA

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J Atten Disord. 2018 May;22:627-38.
REGIONAL GRAY MATTER VOLUME DIFFERENCES BETWEEN ADOLESCENTS WITH ADHD AND TYPICALLY DEVELOPING CONTROLS: FURTHER EVIDENCE FOR ANTERIOR CINGULATE INVOLVEMENT.
Bonath B, Tegelbeckers J, Wilke M, et al.
OBJECTIVE: The present study investigated structural brain differences between adolescents with ADHD and matched control participants.
METHOD: Voxel-based morphometry (VBM) using the DARTEL approach was performed to assess regional gray matter (GM) volumes. Additionally, individual performance on tests of attention was recorded to correlate ADHD related cognitive impairments with regional gray matter abnormalities.
RESULTS: We found significantly smaller GM volume in subjects with ADHD compared to their matched controls within the anterior cingulate cortex (ACC), the occipital cortex, bilateral hippocampus/amygdala and in widespread cerebellar regions. Further, reductions of the ACC gray matter volume were found to correlate with scores of selective inattention.
CONCLUSION: These findings underline that structural alterations in a widespread cortico-subcortical network seem to underlie the observable attention problems in patients with ADHD

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J Atten Disord. 2018 Jul;22:848-54.

A Familial Risk Analysis of Emotional Dysregulation: A Controlled Study.

Biederman J, Chan J, Faraone SV, et al.

OBJECTIVE: Children with deficits in emotional regulation operationalized by scores on the Child Behavior Checklist (CBCL) Attention Problems, Aggressive Behavior, and Anxious-Depressed subscales are more likely than others to manifest adverse outcomes. However, the transmission of this profile has not been well studied. The main aim of this study was to investigate the familiality of this profile.
METHOD: Participants were youth probands with bipolar I (BP-I) disorder (N = 140), ADHD (N = 83), and controls (N = 117) and their siblings. Based on the CBCL emotional dysregulation profile, we classified children with severe emotional dysregulation (aggregate cut-off score >/=210) and emotional dysregulation (aggregate cut-off score >/= 180 and <210).
RESULTS: Emotional dysregulation profile scores correlated positively between probands and siblings.
CONCLUSION: Youth with emotional dysregulation are at increased risk to have siblings with similar deficits, suggesting that emotional dysregulation runs in families

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J Atten Disord. 2018 Oct;22:1131-39.

Internet Activities During Leisure: A Comparison Between Adolescents With ADHD and Adolescents From the General Population.

Bolic B, V, Hellberg K, Kjellberg A, et al.

OBJECTIVE: Adolescents' leisure activities are increasingly focusing on Internet activities, and today, these coexist with traditional leisure activities such as sport and meeting friends. The purpose of the present study was to investigate leisure activities, particularly Internet activities, among boys and girls with ADHD, and compare these with boys and girls from the general population. The objective was also to explore how traditional leisure activities and Internet activities interrelate among adolescents with ADHD.
METHOD: Adolescents with ADHD (n = 102) were compared with adolescents from the general population on leisure activities and Internet use.
RESULTS: Leisure activities among adolescents with ADHD tended to focus on Internet activities, particularly online games. Internet activities were broadening leisure activities among adolescents with ADHD, rather than being a substitute for traditional leisure activities.
CONCLUSION: Internet activities may provide adolescents with ADHD accessible means of social interaction

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J Atten Disord. 2018 Oct;22:1173-84.

A Regional ADHD Center-Based Network Project for the Diagnosis and Treatment of Children and Adolescents With ADHD.

Bonati M, Reale L, Zanetti M, et al.

OBJECTIVE: We aimed to define the sociodemographic, clinical, and prescription profiles of the participants enrolled in the Italian Lombardy ADHD Register.
METHOD: Data on patients evaluated by the 18 regional ADHD reference centers in the 2012 to 2013 period were analyzed.
RESULTS: Seven hundred fifty-three of 1,150 (65%) suspected patients received a diagnosis of ADHD. In 24% of cases, there was a family history of ADHD. Four hundred eighty-three (64%) patients had at least one psychopathological disorder, the more common of which were learning disorders (35%). Eighty-four percent of patients received a prescription for psychoeducational interventions, 2% received only pharmacological treatment, and 14% a combination of both. Compared with patients treated with psychoeducational intervention alone, patients with drug prescriptions more commonly presented values of Clinical Global Impressions - Severity scale (CGI-S) of 5 or higher ($p < .0001$).

CONCLUSION: A continuous and systematic monitoring of patterns of care is essential in promoting significant improvements in clinical practice and ensuring an efficient and homogeneous quality of care

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J Autism Dev Disord. 2019 Jul;49:2838-48.

SOCIAL COGNITION IN AUTISM AND OTHER NEURODEVELOPMENTAL DISORDERS: A CO-TWIN CONTROL STUDY.

Isaksson J, Van't Westeinde A, Cauvet É, et al.

Alterations in social cognition (SC) are hypothesized to underlie social communication and interaction challenges in autism spectrum disorder (ASD). The aetiological underpinnings driving this association remain unclear. We examined SC in 196 twins with ASD, other neurodevelopmental disorders or typical development using the naturalistic Movie for the Assessment of Social Cognition. Autism and its severity were assessed with the Autism Diagnostic Observation Schedule-2, and autistic traits with the Social Responsiveness Scale-2. Using within twin-pair regression models, controlling for age, sex, IQ, and unmeasured familial confounders such as genetic background and shared-environment, SC correlated with ASD diagnosis, autism severity, and autistic traits. Our findings highlight the importance of SC alterations in autism and suggest a non-shared environmental impact on the association

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J Bone Joint Surg Am. 2018 Jun;100:930-35.

THE EFFECT OF PREVIOUS METHYLPHENIDATE USE ON INCIDENCE OF STRESS FRACTURES IN MILITARY RECRUITS: A RETROSPECTIVE COHORT.

Ben-Ami IS, Ankory R, Kadar A, et al.

BACKGROUND: Previous research has detected an increased risk of stress fractures among subjects who reported previous use of methylphenidate. Conversely, stimulant medication use has been associated with traumatic fracture risk reduction, possibly because of the improved control of the underlying symptoms of attention deficit hyperactivity disorder (ADHD). The goal of this study was to investigate the effect of previous methylphenidate use on the incidence of traumatic and stress fractures among combat soldiers with previously treated and untreated ADHD.

METHODS: The retrospective cohort included 100,000 combat soldiers recruited to the Israeli Defense Forces from 2005 through 2015. Diagnosis of ADHD and previous exposure to methylphenidate were determined on the basis of self-reported recruitment questionnaires and medical records. Accordingly, the cohort was divided into 3 groups: subjects with ADHD who were previously treated with methylphenidate (n = 689), untreated subjects with ADHD reporting no medication use (n = 762), and controls having no ADHD diagnosis (n = 98,549). Logistic regressions were fitted to determine the odds ratios (ORs) of study subjects for stress and non-stress (traumatic) fractures. Multivariate analysis incorporated baseline characteristics, including age, sex, weight, duration of service, and diagnosis of anemia, at some point during the service.

RESULTS: After adjustment for sex, anemia, weight, age, and duration of service, the risk of traumatic fractures was increased in both subjects with treated ADHD (OR, 1.03 [95% confidence interval (CI), 1.00 to 1.05]) and subjects with untreated ADHD (OR, 1.04 [95% CI, 1.02 to 1.07]) compared with controls. Subjects in the treated ADHD group were at a higher risk of stress fractures (OR, 1.04 [95% CI, 1.02 to 1.07]). Interestingly, a diagnosis of anemia was an independent predictor of stress fractures (OR, 1.05 [95% CI, 1.04 to 1.06]).

CONCLUSIONS: Methylphenidate use is associated with an increased risk of stress fractures but a decreased risk of traumatic fractures in individuals diagnosed with ADHD. These and previous findings may serve as sufficient basis for screening for other risk factors and perhaps taking prevention measures in all those using stimulant medications, especially those planning to engage in strenuous physical activity.

LEVEL OF EVIDENCE: Prognostic Level III. See Instructions for Authors for a complete description of levels of evidence

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J Clin Child Adolesc Psychol. 2018;47:S137-S149.

PARENTAL ADHD AND DEPRESSION: TIME-VARYING PREDICTION OF OFFSPRING EXTERNALIZING PSYCHOPATHOLOGY.

Brammer WA, Galan CA, Mesri B, et al.

Parental attention deficit/hyperactivity disorder (ADHD) and depression are risk factors for negative child outcomes, but given their frequent co-occurrence and variability over time, developmentally sensitive studies are needed. To characterize change in parental ADHD and depression as predictors of change in child ADHD and oppositional defiant disorder (ODD), 230 five- to ten-year-old children with (n = 110) and without (n = 120) ADHD were followed prospectively for 2 years with 90% retention. At baseline and again 2 years later (i.e., Wave 2), parents self-reported their ADHD and depression; parents and teachers also separately rated child ADHD and ODD, as well as broader attention and externalizing problems. Controlling for child sex, race-ethnicity, age, and parental depression, generalized estimating equations revealed that 2-year decreases in parental ADHD significantly predicted reduced child ADHD symptoms, but only among non-ADHD youth. Alternatively, increasing parental depression positively predicted change in teacher-rated ODD symptoms. These findings provide quasi-experimental evidence that parental ADHD and depression may be time-varying risk factors with respect to key dimensions of child externalizing behavior problems. We consider the potential dynamic and reciprocal interrelations among parental ADHD and depression with developmental change in offspring ADHD and ODD. We also discuss implications of parent psychopathology in the development of interventions to reduce the burden of youth ADHD and associated externalizing behavior

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J Clin Child Adolesc Psychol. 2018;47:S369-S383.

FACE-TO-FACE VERSUS ONLINE BEHAVIORAL PARENT TRAINING FOR YOUNG CHILDREN AT RISK FOR ADHD: TREATMENT ENGAGEMENT AND OUTCOMES.

Dupaul GJ, Kern L, Belk G, et al.

Attention deficit/hyperactivity disorder (ADHD) is associated with significant challenges in child functioning. Although behavioral parent training (BPT) can reduce ADHD symptoms, factors associated with traditional face-to-face (F2F) delivery results in only about half of families receiving BPT. The purpose of this pilot randomized controlled trial was to examine parent engagement and program acceptability of F2F and online BPT, as well as the efficacy of both formats relative to a waitlist control (WLC) group. Participants were 47 families with preschool children (30 boys, 17 girls) who were between the ages of 3 years 0 months (3;0) and 5 years 11 months (5;11) old who were identified at risk for ADHD. Children were randomly assigned to F2F or online BPT or to WLC; parents in the two treatment conditions received 10 sessions of BPT. Assessment data for all groups were collected at pre-, mid-, and posttreatment. Both intervention formats resulted in high attendance (M = 80%) and significantly improved parent knowledge of interventions, treatment implementation fidelity, and child behavior (reduced restlessness and impulsivity, improved self-control, affect, and mood) compared with WLC. However, parents in the F2F group reported significantly higher acceptability ratings than parents in the online group. Findings indicate a streamlined BPT delivered online or F2F results in high levels of engagement, acceptability, as well as parent treatment knowledge and fidelity. Online BPT is associated with similar efficacious outcomes with F2F BPT, suggesting the need for further research to determine variables that predict greater acceptability for and adoption of this format

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J Clin Child Adolesc Psychol. 2018;47:S127-S136.

PARENT AND CHILD ADHD SYMPTOMS IN RELATION TO PARENTAL ATTITUDES AND PARENTING: TESTING THE SIMILARITY-FIT HYPOTHESIS.

Johnston C, Williamson D, Noyes A, et al.

OBJECTIVE: We tested the similarity-fit hypothesis that predicts more positive parenting when both parent and child have high levels of ADHD symptoms compared to when only one does.

METHOD: Mothers and fathers of 156, 5 to 13 year old sons participated (110 boys with ADHD, 46 without). Parent inattentive and hyperactive-impulsive symptoms were examined, in interaction with child ADHD, as predictors of parental tolerance, empathy, encouragement of child autonomy, and positive parenting.
RESULTS: Several interactions of parent ADHD symptoms and child ADHD were detected which suggested that for parents with low levels of symptoms, the presence of child ADHD was associated with less positive parenting attitudes and behavior, but this negative relation between positive parenting and child ADHD was dampened among parents with more ADHD symptoms.
CONCLUSIONS: Considered alongside the well documented parenting difficulties associated with parental ADHD, our findings suggest that parental ADHD symptoms also may help to mitigate some of the challenges facing families of children with ADHD

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J Clin Child Adolesc Psychol. 2018;47:S76-S87.

PARENTAL SEROTONIN TRANSPORTER POLYMORPHISM (5-HTTLPR) MODERATES ASSOCIATIONS OF STRESS AND CHILD BEHAVIOR WITH PARENTING BEHAVIOR.

Morgan JE, Hammen C, Lee SS.

The serotonin transporter-linked polymorphic region (5-HTTLPR) is associated with caregiving in nonhuman animals and with affective and cognitive correlates of human parenting, yet its association with human parenting is largely unknown. Using a well-characterized sample of parents and offspring, we evaluated the association of parental 5-HTTLPR with observed positive and negative parenting behavior, as well as its biologically plausible moderation of child-related stress and disruptive child behavior as predictors of parenting. One hundred and sixty-two parents (86% mothers) and their 6- to 9-year-old children with and without attention-deficit/hyperactivity disorder were ascertained using multiple methods including structured interviews, rating scales, and observed parent-child interaction, yielding strong measures of key constructs. Controlling for multiple youth-level (e.g., sex, 5-HTTLPR genotype, disruptive behavior) and parent-level (e.g., demographics, depression, attention-deficit/hyperactivity disorder) factors, parents with an S allele exhibited significantly less observed positive parenting than those with the LL genotype. Significant Gene x Environment interactions were also observed: Child-related stress was negatively associated with observed parental negativity among SS/SL genotype parents but not LL genotype parents; next, observed disruptive child behavior was positively associated with parental negativity for both genotypes, but the effect was strongest in SS/SL parents. These preliminary findings suggest that parental 5-HTTLPR is uniquely associated with positive and negative parenting behavior, with more specific patterns according to child-related stress and disruptive child behavior. We consider implications for future research evaluating genetic influences on parenting as well as considerations for designing and delivering parenting-based interventions

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J Clin Exp Neuropsychol. 2018 Aug;40:576-85.

A NOVEL EXPERIMENTAL PARADIGM TO EVALUATE CHILDREN AND ADOLESCENTS DIAGNOSED WITH ATTENTION-DEFICIT/HYPERACTIVITY DISORDER: COMPARISON WITH TWO STANDARD NEUROPSYCHOLOGICAL METHODS.

Rosetti MF, Ulloa RE, Reyes-Zamorano E, et al.

INTRODUCTION: In this study we evaluated a recently developed test, the Ball Search Field Task (BSFT) as a neuropsychological tool for measuring cognitive and behavioral performance of individuals with disorders such as attention-deficit/hyperactivity disorder (ADHD), which are frequently accompanied by cognitive deficits and a lack of behavioral inhibition. The task provides a complementary method of assessment that attempts ecological validity by drawing on challenges faced in real-world situations. In this task, energetic costs and gross sensorimotor feedback are involved, as participants are required to search for targets in a large open area.
METHOD: We compared performance on the BSFT in a clinical sample of children and adolescents with a diagnosis of ADHD with their scores on two widely used neuropsychological tools, the Tower of London (ToLo) and the Behavior Rating Inventory of Executive Function (BRIEF).

RESULTS: We found no correlations between scores on the BRIEF and those on either the BSFT or ToLo. However, we found moderate correlations between rule violations on ToLo and several BSFT variables, suggesting the capacity of these tests to detect common aspects of executive dysfunction.
CONCLUSIONS: These findings, although modest, encourage further study of tasks like the BSFT, which may help assess cognitive dysfunction found in neurodevelopmental disorders such as ADHD in ecologically valid situations

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J Dual Diagn. 2018 Oct;14:228-36.
THE RELATION BETWEEN ADHD MEDICATION AND MILD COGNITIVE IMPAIRMENT, AS ASSESSED BY THE MONTREAL COGNITIVE ASSESSMENT (MOCA), IN PATIENTS ENTERING SUBSTANCE USE DISORDER INPATIENT TREATMENT.
Helene BT, Julius SM.
OBJECTIVE: Attention-deficit/hyperactivity disorder (ADHD) frequently co-occurs with substance use disorders and has some overlapping symptoms with mild cognitive impairment, including executive functions. We wanted to investigate whether patients with ADHD have an excess risk of mild cognitive impairment-like symptoms, as defined by the Montreal Cognitive Assessment (MoCA). Second, we assessed the impact of ADHD medication on the dichotomized MoCA for patients with ADHD.
METHODS: The participants in this study were 129 inpatients at seven treatment clinics in Norway. All were screened with the MoCA. We calculated relative risk estimates (RR) for scoring in the mild cognitive impairment range (< 26) for those having ADHD. Finally, we calculated the RR for the patients within the ADHD group who were taking medication.
RESULTS: Of the 129 participants included in the analyses, 38 (29.5%) scored below the MoCA threshold (< 26), and 24 (18.6%) had ADHD that was diagnosed before or during the inpatient treatment. Of the 105 participants without ADHD, 31 (29.5%) scored below the threshold. Seven (29.2%) of those with ADHD scored below the threshold. The risk of scoring in the mild cognitive impairment range for those with and without ADHD was equal (RR = 0.98). Of the 24 patients with ADHD, 9 (37.5%) were taking medication at the time of testing. One of the patients taking medication scored below the threshold compared to six of those not taking medication. This suggests a 72% lower risk of mild cognitive impairment-like symptoms when taking medication (RR = 0.28); however, the effect was not significant.
CONCLUSIONS: We revealed no excess risk of mild cognitive impairment-like symptoms for the ADHD group. However, within the ADHD group, there was a possible lower risk of mild cognitive impairment-like symptoms for patients taking medication. These results suggest that there may be a confounding overlap of symptoms between ADHD and cognitive function screens that necessitates adequate assessment and treatment of ADHD before screening or measuring cognitive function

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J Nerv Ment Dis. 2018 Sep;206:726-32.
CLINICAL CORRELATES OF CANNABIS USE AMONG INDIVIDUALS WITH ATTENTION DEFICIT HYPERACTIVITY DISORDER.
Brandt A, Rehm J, Lev-Ran S.
In this study, we explored patterns and clinical correlates of cannabis use among individuals with attention-deficit/hyperactivity disorder (ADHD). Data were obtained from Wave 2 of the National Epidemiologic Survey on Alcohol and Related Conditions (2004-2005). Psychiatric disorders were assessed using the Alcohol Use Disorder and Associated Disabilities Interview Schedule. We used multivariate logistic regression models adjusting for sociodemographics, psychiatric disorders, and substance use disorders. Prevalence of cannabis use among individuals with and without ADHD was 14.3% and 4.3%, respectively. Diagnosis of any psychiatric disorder was significantly higher among those with ADHD and concurrent cannabis use compared with nonusers (adjusted odds ratio [AOR], 2.8; 95% confidence interval [CI], 1.08-6.41), as were odds of a lifetime personality disorder (AOR, 4.04; 95% CI, 1.84-8.84). Individuals with the hyperactive

subtype initiated cannabis at a significantly earlier age compared with those with the inattentive subtype (13.8 +/- 0.56 vs. 16.3 +/- 0.5 years, respectively; p = 0.0017). Longitudinal prospective studies are required to further clarify the effects and patterns of cannabis use in this clinical population

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J Pediatr Psychol. 2018 Apr;43:342-51.

EFFECTS OF NEONATAL PAIN AND TEMPERAMENT ON ATTENTION PROBLEMS IN TODDLERS BORN PRETERM.

Gaspardo CM, Cassiano RGM, Gracioli SMA, et al.

Objective: To examine the effects of individual characteristics of neonates and neonatal pain-related stress on attention problems and externalizing behavior problems of toddlers born preterm, analyzing the moderating effects of the dispositional traits of temperament.

Methods: The sample included 62 toddlers aged 18-36 months and their mothers. The mothers were interviewed using the Child Behavior Checklist 1.5-5 for toddlers' attention and externalizing behavior problems assessment, the Early Childhood Behavior Questionnaire for toddlers' temperament assessment, and the Adult Temperament Questionnaire for their temperament assessment. The Neonatal Infant Stressor Scale analyzed the number of pain-related stress events during neonatal intensive care unit (NICU) hospitalization recorded in the medical charts. Statistical descriptive, correlation, and multiple linear regression analyses were performed.

Results: High neonatal pain-related stress total index, associated with toddler's temperament with less Effortful Control, and mother's temperament with high Surgency explained 23% variability of the attention problems. Otherwise, the externalizing behavior problems were explained by temperament, but not by neonatal pain-related stress.

Conclusions: The findings support the impact of neonatal pain experiences, and current toddlers' and mothers' temperament characterized by poorer self-regulation on attention problems in toddlers born preterm. Developmental care in the NICU and follow-up programs after discharge are recommended to promote regulated temperament of the mother-child dyads, aiming to prevent attentional problems in toddlers born preterm

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J Psychiatr Res. 2018 Jun;101:63-71.

PREGNANCY RISK FACTORS IN RELATION TO OPPOSITIONAL-DEFIANT AND CONDUCT DISORDER SYMPTOMS IN THE AVON LONGITUDINAL STUDY OF PARENTS AND CHILDREN.

Ruisch IH, Buitelaar JK, Glennon JC, et al.

BACKGROUND: Pregnancy factors have been implicated in offspring oppositional-defiant disorder (ODD) and conduct disorder (CD) symptoms. Literature still holds notable limitations, such as studying only a restricted set of pregnancy factors, use of screening questionnaires which assess broadly defined outcome measures, and lack of control for disruptive behavior comorbidity and genetic confounds. We aimed to address these gaps by prospectively studying a broad range of pregnancy factors in relation to both offspring ODD and CD symptomatology in the Avon Longitudinal Study of Parent and Children.

METHODS: Outcomes were ODD and CD symptom scores at age 7;9 years using the Development and Well-Being Assessment interview. We analyzed maternal (N approximately 6300) and teacher ratings (N approximately 4400) of ODD and CD scores separately using negative binomial regression in multivariable models. Control variables included comorbid attention-deficit/hyperactivity disorder symptoms, ODD or CD symptoms as appropriate, and genetic risk scores based on an independent CD genome-wide association study.

RESULTS: Higher ODD symptom scores were linked to paracetamol use (IRR=1.24 [98.3% confidence interval 1.05-1.47], P=0.002, teacher ratings) and life events stress (IRR=1.22 [1.07-1.39], P=0.002, maternal ratings) during pregnancy. Higher CD symptom scores were linked to maternal smoking (IRR=1.33 [1.18-1.51], P<0.001, maternal ratings), life events stress (IRR=1.24 [1.11-1.38], P<0.001, maternal ratings) and depressive symptoms (IRR=1.14 [1.01-1.30], P=0.006, maternal ratings) during pregnancy.

CONCLUSIONS: Common and potentially preventable pregnancy risk factors were independently related to both offspring ODD and CD symptomatology in children from the general population. Future studies should further address genetic confounds and confounding by environmental factors later in life

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JAMA Netw Open. 2018 Aug;1:e181471.

TWENTY-YEAR TRENDS IN DIAGNOSED ATTENTION-DEFICIT/HYPERACTIVITY DISORDER AMONG US CHILDREN AND ADOLESCENTS, 1997-2016.

Xu G, Strathearn L, Liu B, et al.

Importance: Attention-deficit/hyperactivity disorder (ADHD) is common in US children and adolescents. It is important to understand the most recent prevalence of ADHD and its long-term trends over the past decades.

Objective: To estimate the prevalence of diagnosed ADHD and 20-year trends from 1997 to 2016 among US children and adolescents using nationally representative data.

Design, Setting, and Participants: In this population-based, cross-sectional survey study (National Health Interview Survey), surveys were conducted annually from 1997 to 2016. A total of 186457 children and adolescents aged 4 to 17 years from 1997 to 2016 were included in this analysis. Data were collected through in-person household interviews with a parent or guardian. The data analysis was performed in January 2018.

Main Outcomes and Measures: Attention-deficit/hyperactivity disorder diagnosed by a physician or other health care professional.

Results: Among the included 186457 children and adolescents (96017 boys [51.5%], 51350 Hispanic [27.5%], 91374 non-Hispanic white [49.0%], 28808 non-Hispanic black [15.5%], 14925 non-Hispanic other race [8.0%]), 14704 children and adolescents (7.9%; 10536 boys [71.7%], 2497 Hispanic [17.0%], 9010 non-Hispanic white [61.3%], 2328 non-Hispanic black [15.8%], and 869 non-Hispanic other race [5.9%]) were reported to have ever been diagnosed with ADHD. The weighted prevalence of diagnosed ADHD was 10.2% (95% CI, 9.6%-10.8%) in 2015-2016. There were significant sex and racial/ethnic disparities in the prevalence of diagnosed ADHD. The prevalence was 14.0% (95% CI, 13.1%-15.0%) in boys and 6.3% (95% CI, 5.6%-7.0%) in girls, 6.1% (95% CI, 5.2%-7.0%) in Hispanic individuals, 12.0% (95% CI, 11.1%-12.9%) in non-Hispanic white individuals, and 12.8% (95% CI, 11.0%-14.5%) in non-Hispanic black individuals. Over the 20-year period, the estimated prevalence of diagnosed ADHD in US children and adolescents increased from 6.1% in 1997-1998 to 10.2% in 2015-2016 (P for trend <.001). All subgroups by age, sex, race/ethnicity, family income, and geographic regions showed a significant increase in the prevalence from 1997-1998 to 2015-2016.

Conclusions and Relevance: This study's findings suggest that among US children and adolescents, the estimated prevalence of diagnosed ADHD increased significantly between 1997-1998 and 2015-2016. This study suggests that additional research is needed to better understand the cause of this apparent rise in prevalence

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JAMA Netw Open. 2018 Aug;1:e181504.

PAYING ATTENTION TO ATTENTION-DEFICIT/HYPERACTIVITY DISORDER.

Dickstein DP.

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JAMA Pediatr. 2018 Jan;172:49-56.

VARIATION IN THE 12-MONTH TREATMENT TRAJECTORIES OF CHILDREN AND ADOLESCENTS AFTER A DIAGNOSIS OF DEPRESSION.

Joyce NR, Schuler MS, Hadland SE, et al.

Importance: Depression during childhood and adolescence is heterogeneous. Treatment patterns are often examined in aggregate, yet there is substantial variability across individual treatment trajectories. Understanding this variability can help identify treatment gaps among youths with depression.

Objective: To characterize heterogeneity in 12-month trajectories of psychotherapy and antidepressant treatment in youths with depression.
Design, Setting, and Participants: This is a longitudinal-cohort study of youths 18 years or younger with a new diagnosis of depression and at least 12 months of follow-up following diagnosis, as determined from commercial insurance claims filed from 2007 to 2014. Latent class models were fit to summary measures of psychotherapy and antidepressant use in the 12 months following the index diagnosis. We examined variation in baseline health, health care utilization, and health outcomes across classes with similar patterns of psychotherapy and antidepressant use. Data analysis took place between June 2016 and March 2017.
Main Outcomes and Measures: Psychotherapy and antidepressant use.
Results: The cohort included 84909 individuals with a mean (SD) age at index diagnosis of 15.0 (2.6) years, of whom 49995 (59%) were female. Attention-deficit/hyperactivity disorder (n = 14625; 17%) and anxiety (n = 12358; 15%) were the most common comorbid diagnoses. During the assessment period, 59023 individuals (70%) received psychotherapy at any point, and 33997 individuals (40%) were dispensed antidepressants at any point. Eight classes with distinct treatment trajectories were identified, which we classified into 4 broad groups: 3 classes that received dual therapy (n = 18710; 22%), 2 classes that received antidepressant monotherapy (n = 15287; 18%), 2 classes that received psychotherapy monotherapy (n = 40313; 48%) and 1 class that received no treatment (n = 10599; 13%). The most common class received psychotherapy monotherapy (n = 35243; 42%) and had the lowest incidence of attempted suicide (0.8 per 100 person-years [PY]) and inpatient hospitalization (3.5 per 100 PY) during the assessment period and postassessment period (0.5 per 100 PY and 1.3 per 100 PY, respectively). The group receiving dual therapy had the highest incidence of attempted suicide during the assessment period (4.7-7.1 per 100 PY, depending on the class) and postassessment period (1.5-1.7 per 100 PY).
Conclusions and Relevance: In our sample, 13% of youths received no treatment, and 18% received antidepressants without concomitant psychotherapy. Summary measures of treatment can mask informative patterns of psychotherapy and antidepressant use. Latent class analysis can be used to identify subgroups of individuals with similar treatment trajectories and help identify treatment gaps under current practice patterns

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JAMA Pediatr. 2018 May;172:423-30.

ASSOCIATION OF MENTAL HEALTH CONDITIONS AND TREATMENTS WITH LONG-TERM OPIOID ANALGESIC RECEIPT AMONG ADOLESCENTS.

Quinn PD, Hur K, Chang Z, et al.

Importance: Adults with mental health conditions are more likely than those without to receive long-term opioid therapy. Less is known about opioid therapy among adolescents, especially those with mental health conditions.
Objective: To examine associations between preexisting mental health conditions and treatments and initiation of any opioid and long-term opioid therapy among adolescents.
Design, Setting, and Participants: A cohort of 1224520 incident opioid recipients without cancer diagnoses aged 14 to 18 years at first receipt was extracted from nationwide commercial health care claims data from January 1, 2003, to December 31, 2014. Analysis was conducted from August 19, 2016, to November 16, 2017. Associations between preexisting mental health conditions and treatments and any opioid receipt were examined by comparing recipients with nonrecipients matched on sex, calendar year and years of age of first enrollment, and months of enrollment (prior to the index month for recipients, ever for nonrecipients). Associations between preexisting mental health conditions and treatments and subsequent long-term opioid therapy were examined among recipients with at least 6 months' follow-up using Cox proportional hazards regressions adjusted for demographics.
Exposures: Mental health condition diagnoses and treatments recorded in inpatient, outpatient, and filled-prescription claims prior to opioid receipt.
Main Outcomes and Measures: Opioid receipt, defined as any opioid analgesic prescription claim, and long-term opioid therapy, defined as more than 90 days' supply within a 6-month window having no gaps in supply of more than 32 days.

Results: Of the 1224520 new opioid recipients included, the median age at first receipt was 17 years (interquartile range, 16-18 years), and 51.1% were female. Median follow-up after first receipt was 625 days (interquartile range, 255-1268 days). Adolescents with anxiety, mood, neurodevelopmental, sleep, and nonopioid substance use disorders and most mental health treatments were significantly more likely to receive any opioid (odds ratios from 1.13 [95% CI, 1.10-1.16] for nonopioid substance use disorders to 1.69 [95% CI, 1.58-1.81] for nonbenzodiazepine hypnotics). Among the 1000453 opioid recipients (81.7%) who had at least 6 months' follow-up, the cumulative incidence of long-term opioid therapy was 3.0 (95% CI, 2.8-3.1) per 1000 recipients within 3 years after first opioid receipt. All preexisting mental health conditions and treatments were strongly associated with higher rates of long-term opioid therapy (adjusted hazard ratios from 1.73 [95% CI 1.54-1.95] for attention-deficit/hyperactivity disorder to 8.90 [95% CI, 5.85-13.54] for opioid use disorder).
Conclusions and Relevance: Commercially insured adolescents with many types of preexisting mental health conditions and treatments were modestly more likely to receive any opioid and were substantially more likely to subsequently transition to long-term opioid therapy relative to those without, although overall rates of long-term opioid therapy were low

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JAMA Pediatr. 2019.

ASSOCIATION OF RELATIVE AGE IN THE SCHOOL YEAR WITH DIAGNOSIS OF INTELLECTUAL DISABILITY, ATTENTION-DEFICIT/HYPERACTIVITY DISORDER, AND DEPRESSION.

Root A, Brown JP, Forbes HJ, et al.

Importance: Young relative age within the school year has previously been associated with attention-deficit/hyperactivity disorder (ADHD) diagnosis and, based on limited evidence, diagnosis of intellectual disability. No study to date has examined the association between relative age and diagnosis of depression.
Objectives: To estimate the associations with intellectual disability and ADHD and investigate a potential novel association between relative age and childhood depression.
Design, Setting, and Participants: This population-based cohort study of 1042106 children aged 4 to 15 years used electronic record data collected before January 3, 2017, from more than 700 general practices contributing to the UK Clinical Practice Research Datalink. Multivariable Cox proportional hazards regression modeling was used to explore the association between relative age and the incidence of intellectual disability, ADHD, and depression before age 16 years. Data were analyzed between July 2017 and January 2019.
Exposures: Relative age within school year determined by month of birth and categorized into four 3-month groups.
Main Outcomes and Measures: Intellectual disability, ADHD, and depression.
Results: In the total cohort of 1042106 children, 532876 were male (51.1%) and the median age at study entry was 4.0 years (interquartile range, 4.0-5.0). There was evidence that being born in the last quarter of the school year (ie, being the youngest group in a school year) was associated with diagnosis of intellectual disability (adjusted hazard ratio [aHR], 1.30; 95% CI, 1.18-1.42), ADHD (aHR, 1.36; 95% CI, 1.28-1.45), and depression (aHR, 1.31; 95% CI, 1.08-1.59) compared with being born in the first quarter. A graded association was seen with intermediate age groups at a smaller increased risk of each diagnosis compared with the oldest group, with aHRs for intellectual disability for those born in the second quarter of 1.06 (95% CI, 0.96-1.17) and for those born in the third quarter of 1.20 (95% CI, 1.09-1.32); aHRs for ADHD for those born in the second quarter of 1.15 (95% CI, 1.08-1.23) and for those born in the third quarter of 1.31 (95% CI, 1.23-1.40); and aHRs for depression for those born in the second quarter of 1.05 (95% CI, 0.85-1.29) and for those born in the third quarter of 1.13 (95% CI, 0.92-1.38).
Conclusions and Relevance: In this study, relative youth status in the school year is associated with an increased risk of diagnosis of ADHD, intellectual disability, and depression in childhood. Further research into clinical and policy interventions to minimize these associations appears to be needed

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JAMA Psychiatry. 2018 Feb;75:167-75.

ASSOCIATION BETWEEN METHYLPHENIDATE AND AMPHETAMINE USE IN PREGNANCY AND RISK OF CONGENITAL MALFORMATIONS: A COHORT STUDY FROM THE INTERNATIONAL PREGNANCY SAFETY STUDY CONSORTIUM.

Huybrechts KF, Broms G, Christensen LB, et al.

Importance: Given the rapidly increasing use of stimulant medications during pregnancy and among women of reproductive age who may become pregnant inadvertently, there is a need to better understand their safety.

Objective: To examine the risk of congenital malformations associated with intrauterine exposure to stimulants.

Design, Setting, and Participants: Cohort study of the Medicaid-insured population in the United States nested in the 2000-2013 US Medicaid Analytic eXtract, with follow-up of safety signals detected in the Medicaid Analytic eXtract data using the Nordic Health registries (2003-2013) (Denmark, Finland, Iceland, Norway, and Sweden). A total of 1813894 publicly insured pregnancies in the United States and 2560069 singleton pregnancies in the 5 Nordic countries ending in live births were included. Relative risks were estimated accounting for underlying psychiatric disorders and other potential confounders. Relative risk estimates for the US and Nordic data were pooled using a fixed-effects meta-analytic approach. The study was conducted from July 1, 2015, to March 31, 2017.

Exposures: Methylphenidate and amphetamines dispensed during the first trimester.

Main Outcomes and Measures: Major congenital malformations and subgroup of cardiac malformations.

Results: In the US data, of the 1813894 pregnancies evaluated, 35.0 per 1000 infants not exposed to stimulants were diagnosed as having congenital malformations, compared with 45.9 per 1000 infants for methylphenidate and 45.4 for amphetamines. For cardiac malformations, the risks were 12.7 (95% CI, 12.6-12.9), 18.8 (95% CI, 13.8-25.6), and 15.4 (95% CI, 12.5-19.0) per 1000 infants, respectively. The adjusted relative risks for methylphenidate were 1.11 (95% CI, 0.91-1.35) for any malformation and 1.28 (95% CI, 0.94-1.74) for cardiac malformations. No increased risks were observed for amphetamines: 1.05 (95% CI, 0.93-1.19) for any malformations and 0.96 (95% CI, 0.78-1.19) for cardiac malformations. Findings were confirmed in sensitivity analyses accounting for proxies of unmeasured confounders and increasing the specificity of the exposure and outcome definitions. Replication of the analyses for methylphenidate using the Nordic data including 2560069 pregnancies yielded a relative risk of 1.28 (95% CI, 0.83-1.97) for cardiac malformations, resulting in a pooled estimate of 1.28 (95% CI, 1.00-1.64).

Conclusions and Relevance: These findings suggest a small increase in the risk of cardiac malformations associated with intrauterine exposure to methylphenidate but not to amphetamines. This information is important when weighing the risks and benefits of alternative treatment strategies for attention-deficit/hyperactivity disorder in women of reproductive age and during early pregnancy

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Journal of Clinical Medicine. 2018;7.

USE OF PSYCHOTROPIC DRUGS AMONG CHILDREN AND ADOLESCENTS WITH AUTISM SPECTRUM DISORDERS IN DENMARK: A NATIONWIDE DRUG UTILIZATION STUDY.

Rasmussen L, Bilenberg N, Ernst MT, et al.

Children with autism spectrum disorder (ASD) have a considerable use of psychotropics. Leveraging nationwide registry data, we aimed to describe the use of psychotropics among children and adolescents with ASD in Denmark. Use of melatonin and attention-deficit/hyperactivity disorder (ADHD) medication increased from 2010 to 2017, while there were limited changes in use of antidepressants and antipsychotics. Thirty percent of the identified children used psychotropics in 2017 most commonly ADHD medication (17%) and melatonin (13%). Methylphenidate, sertraline and risperidone were most often prescribed. Most children filled more than one prescription and, across drug classes, at least 38% received treatment two years after treatment initiation. Use of psychotropics followed psychiatric comorbidities. Comorbidities did not affect age at treatment initiation. Use of psychotropics varied according to age and sex with limited use in the youngest children. In summary, psychotropic drug use has increased in children with ASD mainly due to an increase

in the use of ADHD medication and melatonin. In accordance with previous studies, use seems to follow comorbidities. The long treatment duration underlines the need to investigate long-term effects of psychotropic drug use in children with ASD

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Journal of Clinical Medicine. 2019;8.

DEEP LEARNING BASED ON EVENT-RELATED EEG DIFFERENTIATES CHILDREN WITH ADHD FROM HEALTHY CONTROLS.

Vahid A, Bluschke A, Roessner V, et al.

Attention Deficit Hyperactivity Disorder (ADHD) is one of the most prevalent neuropsychiatric disorders in childhood and adolescence and its diagnosis is based on clinical interviews, symptom questionnaires, and neuropsychological testing. Much research effort has been undertaken to evaluate the usefulness of neurophysiological (EEG) data to aid this diagnostic process. In the current study, we applied deep learning methods on event-related EEG data to examine whether it is possible to distinguish ADHD patients from healthy controls using purely neurophysiological measures. The same was done to distinguish between ADHD subtypes. The results show that the applied deep learning model (EEGNet) was able to distinguish between both ADHD subtypes and healthy controls with an accuracy of up to 83%. However, a significant fraction of individuals could not be classified correctly. It is shown that neurophysiological processes indicating attentional selection associated with superior parietal cortical areas were the most important for that. Using the applied deep learning method, it was not possible to distinguish ADHD subtypes from each other. This is the first study showing that deep learning methods applied to EEG data are able to dissociate between ADHD patients and healthy controls. The results show that the applied method reflects a promising means to support clinical diagnosis in ADHD. However, more work needs to be done to increase the reliability of the taken approach

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Journal of Clinical Neuroscience. 2019;68:123-27.

CORTICAL THINNING IN BENIGN EPILEPSY WITH CENTROTEMPORAL SPIKES (BECTS) WITH OR WITHOUT ATTENTION-DEFICIT/HYPERACTIVITY (ADHD).

Karalok ZS et al.

The aim of this study is to evaluate the abnormal cortical structures associated with newly diagnosed benign epilepsy with centrotemporal spikes (BECTS) patients and assessed the effects of comorbid attention-deficit/hyperactivity (ADHD) on these abnormalities. Newly diagnosed BECTS patients (n = 33, 23 males) and age-matched healthy controls (n = 48) were evaluated by surface and volumetric MRI. CAT12 toolbox (HYPERLINK “http://www.neuro.uni-jena.de/cat/”\t“_blank” http://www.neuro.uni-jena.de/cat/, version r1109),
SPM12(HYPERLINK“http://www.fil.ion.ucl.ac.uk/spm/software/spm12/”\t“_blank”http://www.fil.ion.ucl.ac.uk/spm/software/spm12/, version 6225) and MATLAB (9.5, Mathworks, Natick, MA) were used to gather CT estimates. An additional comparison was performed between BECTS children with (n = 13) and without ADHD (n = 20). BECTS patients had significantly smaller volume in left postcentral gyrus when compared to healthy controls. BECTS patients with ADHD had significantly thinner superior-inferior frontal cortex, superior temporal cortex, left pericalcarine, lingual and fusiform cortex to healthy controls. Also BECTS without ADHD patients had thinner cortical areas when compared to healthy controls, however the significance was more relevant in the BECTS with ADHD. The left fusiform cortex of BECTS patients with ADHD patients was significantly thinner than BECTS patients without ADHD. Our results showed that BECTS affects frontal, temporal, parietal and occipital lobes by cortical thinning. Our study supports the need for better characterization of patients with BECTS so identification of different phenotypes can occur. Further studies are needed to investigate the relationship between BECTS and ADHD

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Journal of Clinical Psychology in Medical Settings. 2019.

BRIEF SCREENING MEASURES IDENTIFY RISK FOR PSYCHOLOGICAL DIFFICULTIES AMONG CHILDREN WITH SICKLE CELL DISEASE.

Hood AM, Reife I, King AA, et al.

Children with sickle cell disease (SCD) experience disproportionately high rates of psychological problems. Our goal was to examine the clinical utility of psychological screening measures to identify children with such problems in medical settings. Caregivers completed screening measures assessing socialΓÇôemotional problems, ADHD symptoms, executive dysfunction, and health-related quality of life for children with SCD (receiving either chronic blood transfusion or hydroxyurea) and their siblings. Our findings demonstrated that screening measures identified clinically elevated symptoms in children with SCD that had not been previously reported. Scores for siblings were for the most part in the normal range. The number of days hospitalized (but not cerebral infarct status) predicted higher scores, emphasizing the challenges associated with SCD complications. Overall, our findings support the notion that screening measures reduce the need for reliance on medical provider judgment for psychological referrals and increase equitability in access to services. Early identification resulting in early intervention has contributed substantially to improved psychological functioning in many contexts, and it is thus likely that such improvements would also be achieved in this uniquely vulnerable population

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J Neurochem. 2019;150:73-74.

MAOA AND MAOB GENES ASSOCIATED WITH ATTENTION DEFICIT HYPERACTIVITY DISORDER IN INDO-CAUCASOID POPULATION FROM EASTERN INDIA.

Karmakar A, Chakraborti B, Verma D, et al.

Attention deficit hyperactivity disorder (ADHD) is a behavioral disorder, characterized by symptoms of inattention, excessive motor activity, and impulsivity, detected mostly during the early childhood. Influence of monoamine neurotransmitters (such as dopamine, serotonin, and norepinephrine) in ADHD associated symptoms is well accepted. Monoamine oxidase A (MAOA) and B (MAOB), mitochondrial outer membrane bound enzymes, catabolize those monoamines and hence regulate neuronal activities. Genetic polymorphisms in MAOA and MAOB showed association with ADHD in different populations. In this study, we have tested association of three polymorphisms in MAO genes (30bp-uVNTR and rs6323 in MAOA, and rs56220155 in MAOB) with ADHD in Indo-Caucasoid population from eastern India. Nuclear families with ADHD-probands (N=190) and ethnically matched controls (N=156) were recruited in the study following DSM-IV. Genotyping was performed through PCR-based methods/DNA sequencing. Data were analyzed through population based and family based statistical methods. rs6323 'G' allele, rs56220155 'A' allele, 30bp-uVNTR-rs6323 '3R-G' haplotype, and rs6323-rs56220155 'G-A' haplotype showed significant (pΓëñ0.04) higher frequencies in ADHD-probands as compared to controls. These alleles/haplotypes also revealed significant (pΓëñ0.05) higher frequencies in male-ADHD-probands as compared to sex-matched controls. Along with these alleles/haplotypes, 30bp-uVNTR-rs56220155 '3R-A' haplotype showed significant (p<0.03) maternal transmission to male-ADHD-pro-bands. rs56220155 'GA' genotype showed significant (p=0.03) higher frequencies in female-ADHD probands as compared to sex-matched controls. It may be inferred that both MAOA and MAOB genes are contributing to the etiology of ADHD in Indo-Caucasoid population from eastern India

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Journal of Nutrition. 2019;149:642-48.

CHILDREN'S ATTENTION-DEFICIT/HYPERACTIVITY DISORDER SYMPTOMS PREDICT LOWER DIET QUALITY BUT NOT VICE VERSA: RESULTS FROM BIDIRECTIONAL ANALYSES IN A POPULATION-BASED COHORT.

Mian A, Jansen PW, Nguyen AN, et al.

Background: As an adjuvant for medication, dietary changes focused on specific nutrients have been proposed to prevent or reduce attention-deficit/hyperactivity disorder (ADHD) symptoms. However, whether an overall healthy dietary pattern is associated with ADHD symptom severity during childhood remains unclear. Furthermore, it is not clear what the direction of this association is. Objectives: We aimed to examine

the association between dietary patterns and ADHD symptoms in school-aged children. In addition, we aimed to identify the temporal direction of this association-that is, whether dietary patterns predict ADHD symptoms or vice versa.
Methods: We analyzed data from 3680 children participating in the Generation R Study, a prospective cohort in Rotterdam, Netherlands. ADHD symptoms were assessed with parent-report questionnaires at ages 6 and 10 y using the Child Behavior Checklist. Dietary intake was assessed at the age of 8 y with a validated food-frequency questionnaire. We computed a diet quality score reflecting adherence to dietary guidelines. We examined bidirectional associations of diet quality with ADHD symptom scores using multivariable linear regression analysis and cross-lagged modeling.
Results: Linear regressions showed that more ADHD symptoms at age 6 y were associated with a lower diet quality score at age 8 y (SD score = 0.08; 95% CI: 0.11, 0.05) but that diet quality at age 8 y was not associated with ADHD symptoms at age 10 y. Cross-lagged models confirmed a unidirectional relation from ADHD symptoms to diet quality but not vice versa. Associations did not differ by overweight status or between boys and girls.
Conclusion: Our study suggests that children with more ADHD symptoms may be at higher risk of an unhealthy diet but that overall diet quality does not affect ADHD risk

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J Pediatr. 2019.
CHILDREN WITH ATTENTION-DEFICIT/HYPERACTIVITY DISORDER PERFORM DIFFERENTLY ON PEDIATRIC CONCUSSION ASSESSMENT.
Cook NE, Kelshaw PM, Caswell SV, et al.
Objective: To compare Child Sport Concussion Assessment Tool Fifth Edition (Child SCAT5) performance between uninjured children with attention-deficit/hyperactivity disorder (ADHD) and precisely matched controls without ADHD.
Study design: A nested case-control study was conducted within a cohort of middle school athletes (age 11-12 years) who completed preseason testing. Students with ADHD were individually matched to students without ADHD based on age, sex, language spoken at home, number of prior concussions, sport, and school they attended. The final sample included 54 students (27 with ADHD and 27 controls), 38 (70.4%) boys and 16 (29.6%) girls (average age: 11.7 years, SD = 0.5).
Results: Children with ADHD reported more symptoms (M = 13.33, SD = 5.69, P <.001) and greater symptom severity (M = 22.59, SD = 1 1.60, P <.001) compared with controls (total symptoms: M = 6.44, SD = 4.96; symptom severity: M = 8.04, SD = 6.36). Children with ADHD performed similarly to controls on the Child SCAT5 cognitive tests. Children with ADHD committed 3 times as many total balance errors (median = 6) than children without ADHD (median = 2) and committed twice as many errors on single leg stance (ADHD median = 4; No ADHD median = 2) (P values <.001).
Conclusions: Children with ADHD endorsed more concussion-like symptoms and performed worse on balance testing during preseason Child SCAT5 assessment compared with matched controls without ADHD. These findings highlight the challenges of interpreting Child SCAT5 performance in children with ADHD following a concussion or suspected concussion and illustrate the value of administering the measure to children to document their pre-injury performance

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J Psychosom Res. 2019;126.
IMPACT OF ATTENTION DEFICIT HYPERACTIVITY DISORDER ON METABOLIC CONTROL IN ADOLESCENTS WITH TYPE1 DIABETES.
Macek J, Battelino T, Bizjak M, et al.
Objective: Diabetes mellitus type 1 (T1D) incidence is increasing in pediatric population. Good metabolic control, measured by glycated hemoglobin (HbA1c), significantly reduces the risk for chronic complications. Comorbid disorders, including attention-deficit hyperactivity disorder (ADHD), may influence glycemic control. To date little is known about the prevalence of ADHD among adolescents with T1D and its influence

on diabetes self-management. Therefore, we aimed to identify adolescents with T1D and ADHD and assess the effect of ADHD on metabolic control.
Method: This cross-sectional case-control study included 101 patients (11ΓÇô17 years old) with T1D. Development and Well-Being Assessment (DAWBA) questionnaire and subsequent psychiatric clinical examination were used to identify ADHD in a group with T1D. Indicators of metabolic control were collected from available medical documentation for preceding 12 months and compared between the group of patients with T1D and ADHD and the group of T1D patients without ADHD.
Results: ADHD was diagnosed in 11.9% adolescents with T1D (12 of 101). We found a statistically significant difference (p =.022) in HbA1c between the two groups ΓÇô higher in the group with T1D and ADHD (8.4% or 68.3 mmol/mol) than in the group with T1D without ADHD (7.8% or 61.7 mmol/mol).
Conclusions: Almost 12% of adolescents with type 1 diabetes were diagnosed with ADHD and they had poorer glycemic control. Adolescents with T1D and ADHD must be diagnosed early and offered appropriate treatment focused on preventing negative ADHD impact on metabolic control

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Mov Disord. 2018 Aug;33:1272-80.
ECOPIPAM, A D1 RECEPTOR ANTAGONIST, FOR TREATMENT OF TOURETTE SYNDROME IN CHILDREN: A RANDOMIZED, PLACEBO-CONTROLLED CROSSOVER STUDY.
Gilbert DL, Murphy TK, Jankovic J, et al.
BACKGROUND: Dopamine D2 receptor antagonists used to treat Tourette syndrome may have inadequate responses or intolerable side effects. We present results of a 4-week randomized, double-blind, placebo-controlled crossover study evaluating the safety, tolerability, and efficacy of the D1 receptor antagonist ecopipam in children and adolescents with Tourette syndrome.
METHODS: Forty youth aged 7 to 17 years with Tourette syndrome and a Yale Global Tic Severity Scale - total tic score of >/=20 were enrolled and randomized to either ecopipam (50 mg/day for weight of <34 kg, 100 mg/day for weight of >34 kg) or placebo for 30 days, followed by a 2-week washout and then crossed to the alternative treatment for 30 days. Stimulants and tic-suppressing medications were excluded. The primary outcome measure was the total tic score. Secondary outcomes included obsessive compulsive and attention deficit/hyperactivity disorder scales.
RESULTS: Relative to changes in placebo, reduction in total tic score was greater for ecopipam at 16 days (mean difference, -3.7; 95% CI, -6.5 to -0.9; P = 0.011) and 30 days (mean difference, -3.2; 95% CI, -6.1 to -0.3; P = 0.033). There were no weight gain, drug-induced dyskinesias, or changes in laboratory tests, electrocardiograms, vital signs, or comorbid symptoms. Dropout rate was 5% (2 of 40). Adverse events reported for both treatments were rated predominantly mild to moderate, with only 5 rated severe (2 for ecopipam and 3 for placebo).
CONCLUSIONS: Ecopipam reduced tics and was well tolerated. This placebo-controlled study of ecopipam supports further clinical trials in children and adolescents with Tourette syndrome. (c) 2018 International Parkinson and Movement Disorder Society

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Mult Scler. 2018 Aug;24:1243-50.
PSYCHIATRIC DISORDERS IN CHILDREN WITH DEMYELINATING DISEASES OF THE CENTRAL NERVOUS SYSTEM.
Pakpoor J, Goldacre R, Schmierer K, et al.
INTRODUCTION: The profile of psychiatric disorders associated with multiple sclerosis (MS) may differ in children. We aimed to assess the risk of psychiatric disorders in children with MS and other demyelinating diseases, and vice versa.
PATIENTS AND METHODS: We analyzed linked English Hospital Episode Statistics, and mortality data, 1999-2011. Cohorts were constructed of children admitted with MS and other central nervous system (CNS) demyelinating diseases. We searched for any subsequent episode of care with psychiatric disorders in these cohorts and compared to a reference cohort.
RESULTS: Children with CNS demyelinating diseases had an increased rate of psychotic disorders (rate ratio (RR) = 5.77 (95% confidence interval (CI) = 2.48-11.41)); anxiety, stress-related, and somatoform

disorders (RR = 2.38 (1.39-3.81)); intellectual disability (RR = 6.56 (3.66-10.84)); and other behavioral disorders (RR = 8.99 (5.13-14.62)). In analysis of the pediatric MS cohort as the exposure, there were elevated rates of psychotic disorders (RR = 10.76 (2.93-27.63)), mood disorders (RR = 2.57 (1.03-5.31)), and intellectual disability (RR = 6.08 (1.25-17.80)). In reverse analyses, there were elevated rates of a recorded hospital episode with CNS demyelinating disease after a previous recorded episode with anxiety, stress-related, and somatoform disorders; attention-deficit hyperactivity disorder (ADHD); autism; intellectual disability; and other behavioral disorders.
CONCLUSION: This analysis of a national diagnostic database provides strong evidence for an association between pediatric CNS demyelinating diseases and psychiatric disorders, and highlights a need for early involvement of mental health professionals

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N Engl J Med. 2019 Aug;381:863-71.
CASE 27-2019: A 16-YEAR-OLD GIRL WITH HEAD TRAUMA DURING A SAILBOAT RACE.
Iaccarino MA, Zafonte RD, Roy ED, et al.

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Nat Rev Dis Primers. 2019 Jun;5:43.
CONDUCT DISORDER.
Fairchild G, Hawes DJ, Frick PJ, et al.
Conduct disorder (CD) is a common and highly impairing psychiatric disorder that usually emerges in childhood or adolescence and is characterized by severe antisocial and aggressive behaviour. It frequently co-occurs with attention-deficit/hyperactivity disorder (ADHD) and often leads to antisocial personality disorder in adulthood. CD affects ~3% of school-aged children and is twice as prevalent in males than in females. This disorder can be subtyped according to age at onset (childhood-onset versus adolescent-onset) and the presence or absence of callous-unemotional traits (deficits in empathy and guilt). The aetiology of CD is complex, with contributions of both genetic and environmental risk factors and different forms of interplay among the two (gene-environment interaction and correlation). In addition, CD is associated with neurocognitive impairments; smaller grey matter volume in limbic regions such as the amygdala, insula and orbitofrontal cortex, and functional abnormalities in overlapping brain circuits responsible for emotion processing, emotion regulation and reinforcement-based decision-making have been reported. Lower hypothalamic-pituitary-adrenal axis and autonomic reactivity to stress has also been reported. Management of CD primarily involves parent-based or family-based psychosocial interventions, although stimulants and atypical antipsychotics are sometimes used, especially in individuals with comorbid ADHD

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Neurogastroenterology and Motility. 2019;31.
CHARACTERIZATION OF ANORECTAL MANOMETRY OF CHILDREN WITH ATTENTION DEFICIT HYPERACTIVITY DISORDER (ADHD).
Baker C, Silvernale C, Zar-Kessler C.
Introduction: Attention-deficit hyperactivity disorder (ADHD) is a neurologic disorder characterized by hyperactivity and/or inattentiveness. Adult patients report more flatulence and less frequent stools than those without ADHD. We analyzed the GI manifestations in our pediatric ADHD population focusing on symptomatology, associated diagnoses, and relationship to anorectal manometry characteristics.
Methods: This is a retrospective analysis of a prospective study of patients aged 6-19 years old seen at our institution for evaluation of refractory constipation and fecal incontinence with high resolution anorectal manometry (ARM) between 2016-2018. Patients sedated for the procedure or with anorectal malformations were excluded. Prior to the ARM, patients filled out questionnaires assessing presenting symptoms, sensory disorders, family confirmation of the ADHD diagnosis and identified sub-types of ADHD. Manometry was performed and interpreted by the same provider prior to review of questionnaire results.

Results: 62 patients (16 with ADHD, 46 without ADHD) (75 patients evaluated, 13 excluded) filled out questionnaires and had a non-sedated anorectal manometry. ADHD patients more often presented with fecal incontinence than those without (33%, 11% P = 0.049), had multiple stools per day (57%, 9% P =<0.0001) and an additional diagnosis of a sensory integration disorder (SID) (14%, 1.6% P = 0.02). ADHD patients more frequently reported sensitivities to food texture (38%, 13% P = 0.01), clothing texture (33%, 1% P = 0.001), and sounds (43%, 8% P = 0.0002). There was no difference in maximum resting or squeezing anal sphincter pressure between patients in these two groups nor each individual sub-type of ADHD. Sensation thresholds of the sub-types showed that patients with both inattentive and hyperactivity had a higher first sensation threshold than those without ADHD (184 mL, ADHD n = 5, 92.6 mL, nl, n = 87, P = 0.025). Although not statistically different, all ADHD patients had a smaller sensation differential between the first and urge sensations compared to normal patients (31 mL, 45.6 mL P = 0.25).
Discussion: This is the first study to characterize anorectal manometry findings in pediatric patients with ADHD. These patients present more frequently with fecal incontinence and those with the combined subtype may have an increased initial sensation threshold. The increased presence of SID and other sensitivities in ADHD patients suggest that issues with processing sensory input may be contributing

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NeuroImage Clin. 2019;24.

BRAIN IRON LEVELS IN ATTENTION-DEFICIT/HYPERACTIVITY DISORDER NORMALIZE AS A FUNCTION OF PSYCHOSTIMULANT TREATMENT DURATION.

Adisetiyo V, Gray KM, Jensen JH, et al.

Brain iron homeostasis is a dopamine-related mechanism that may be modified with long-term psychostimulant treatment in attention-deficit/hyperactivity disorder (ADHD). We previously reported that while medication-na+»ve youth with ADHD have reduced brain iron compared to controls and psychostimulant-medicated patients, no differences were detected between the latter groups. In this follow-up study, we examined whether the duration of psychostimulant treatment correlates with the degree of iron normalization. Brain iron was indexed with MRI using an advanced method called magnetic field correlation (MFC) imaging and the conventional R2* proton transverse relaxation rate method. MFC was acquired in 30 psychostimulant-medicated youth with comorbid-free ADHD and 29 age-matched controls (all males). R2* was acquired in a subset of these individuals. Region-of-interest analyses for MFC and R2* group differences and within-group correlations with age and years of psychostimulant treatment were conducted in the globus pallidus (GP), putamen (PUT), caudate nucleus (CN), thalamus (THL) and red nucleus. No significant MFC and R2* group differences were detected. However, while all regional MFC and R2* significantly increased with age in the control group, MFC and R2* increased in the GP, PUT, CN and THL with psychostimulant treatment duration in the ADHD group to a greater degree than with age. Our findings suggest that while youth with ADHD may have less prominent age-related brain iron increases than that seen in typical development, long-term use of psychostimulant medications may compensate through a normalizing effect on basal ganglia iron. Longitudinal studies following ADHD patients before and after long-term psychostimulant treatment are needed to confirm these findings

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Nicotine Tob Res. 2018 Aug;20:S31-S38.

CHARACTERIZING POLYTOBACCO USE TRAJECTORIES AND THEIR ASSOCIATIONS WITH SUBSTANCE USE AND MENTAL HEALTH ACROSS MID-ADOLESCENCE.

Cho J, Goldenson NI, Stone MD, et al.

Background: Polytobacco product use is suspected to be common, dynamic across time, and increase risk for adverse behavioral outcomes. We statistically modeled characteristic types of polytobacco use trajectories during mid-adolescence and tested their prospective association with substance use and mental health problems.
Methods: Adolescents (N = 3393) in Los Angeles, CA, were surveyed semiannually from 9th to 11th grade. Past 6-month combustible cigarette, e-cigarette, or hookah use (yes/no) over four assessments were analyzed using parallel growth mixture modeling to identify a parsimonious set of polytobacco use

trajectories. A tobacco product use trajectory group was used to predict substance use and mental health at the fifth assessment.
Results: Three profiles were identified: (1) tobacco nonusers (N = 2291, 67.5%) with the lowest use prevalence (<3%) of all products across all timepoints; (2) polyproduct users (N = 920, 27.1%) with moderate use prevalence of each product (8-35%) that escalated for combustible cigarettes but decreased for e-cigarettes and hookah across time; and (3) chronic polyproduct users (N = 182, 5.4%) with high prevalence of each product use (38-86%) that escalated for combustible cigarettes and e-cigarettes. Nonusers, polyproduct users, and chronic polyproduct users reported successively higher alcohol, marijuana, and illicit drug use and ADHD at the final follow-up, respectively. Both tobacco using groups (vs. nonusers) reported greater odds of depression and anxiety at the final follow-up but did not differ from each other.
Conclusions: Adolescent polytobacco use may involve a common moderate risk trajectory and a less common high-risk chronic trajectory. Both trajectories predict substance use and mental health symptomology.
Implications: Variation in use and co-use of combustible cigarette, e-cigarette, and hookah use in mid-adolescence can be parsimoniously characterized by a small set common trajectory profiles in which polyproduct use are predominant patterns of tobacco product use, which predict adverse behavioral outcomes. Prevention and policy addressing polytobacco use (relative to single product use) may be optimal tobacco control strategies for youth, which may in turn prevent other forms of substance use and mental health problems

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Nutr Rev. 2018 Jan;76:1-20.

EFFECT OF OMEGA-3 FATTY ACIDS ON COGNITION: AN UPDATED SYSTEMATIC REVIEW OF RANDOMIZED CLINICAL TRIALS.

Rangel-Huerta OD, Gil A.

Context: The increasing number of studies on the effects of n-3 long-chain polyunsaturated fatty acids (LC-PUFAs) on health, particularly cognition, in the last 5 years reflects the growing interest in this area of research.
Objective: The aim for this systematic review was to evaluate the scientific evidence published in the last 5 years (2012-2017) on the effects of n-3 LC-PUFA intake on cognition, cognitive development, and cognitive decline to determine whether n-3 LC-PUFAs support cognitive development and prevent cognitive decline.
Data Sources: The PubMed database was searched.
Study Selection: The 51 articles included in this systematic review reported on healthy individuals with mild or moderate cognitive impairment and patients with Alzheimer's disease. Risk of bias was assessed using Cochrane methodology.
Data Extraction: The number of study participants, the type of study, the type and dose of n-3 LC-PUFAs, and the key results are reported here.
Results: Current evidence indicates that n-3 LC-PUFAs administered during pregnancy or breastfeeding have no effect on the skills or cognitive development of children in later stages of development. Evidence regarding the improvement of cognitive function during childhood and youth or in attention deficit/hyperactivity disorder is inconclusive. Moreover, it is still unclear if n-3 LC-PUFAs can improve cognitive development or prevent cognitive decline in young or older adults

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Nutritional Neuroscience. 2019.

LIFESTYLE FACTORS, DIET AND ATTENTION-DEFICIT/HYPERACTIVITY DISORDER IN SPANISH CHILDREN□ÇÔAN OBSERVATIONAL STUDY.

San MM, I, Sanz RS, Garicano VE, et al.

Background: The aetiology of Attention Deficit Hyperactivity Disorder (ADHD) continues to be debated, although several contributing factors have been acknowledged.
Objective: Assess the association between weight, birth attributes, exercise and sleep habits, dietary intake and adherence to a Mediterranean diet, and impulsive behaviour on Spanish ADHD children. Establish

whether specific food groups (not just adherence to the Mediterranean diet) associate with impulsive behaviour.
Methods: This observational cross-sectional study included 57 ADHD children from Madrid (Spain). Demographic, clinical data, sleep, exercise and technology-use habits were obtained. Anthropometric measurements included height and weight. Adherence to the Mediterranean diet was assessed using the KIDMED test. Barratt Impulsivity Scale version-11c was used to assess impulsivity. Subjects were divided into three groups for analysis, according to their age (6-10 years, children; 11-13 years, pre-adolescents; 14-16 years, adolescents). Results: There were clear associations between those who had higher BIS scores and who slept less at weekends (49.4 -¦ 10.16 vs. 43.8 -¦ 12.51), who adhered poorly to the Mediterranean diet (49.9 -¦ 11.72 vs. 41.6 -¦ 16.52), who used internet and technological devices for >3 h/day (45.5 -¦ 13.6 vs. 44.7 -¦ 12.11), who were born with >2.5 kg (46.1 -¦ 11.61 vs. 42.9 -¦ 15.29), who were delivered by caesarean (45.1 -¦ 12.78 vs. 44.7 -¦ 12.5) and who were not breastfed (45.0 -¦ 13.38 vs. 44.8 -¦ 12.39). Subjects exercising more than 3 days a week also scored slightly higher (45.4-¦14.02 vs. 44.6-¦11.85) in the BIS.
Conclusion: There is a need to follow up the link between ADHD and sleep onset difficulties, dietary patterns, technological habits, perinatal factors, breastfeeding and birth delivery mode

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Paediatrics and Child Health (Canada). 2019;24:153-55.
VISUAL DISORDERS WITH PSYCHOSTIMULANTS: A PAEDIATRIC CASE REPORT.
Soyer J, Jean-Louis J, Ospina LH, et al.
Methylphenidate- A nd amphetamine-based psychostimulants are the most common medications used to treat the symptoms of attention-deficit/hyperactivity disorder in children. Ocular side effects including dry eyes, mydriasis, accommodation disturbance, and blurry vision are listed in the product monograph but interestingly, are rarely reported in the paediatric literature. Our patient, a 9-year-old boy, presented a significant decrease in visual acuity secondary to accommodation disorder after being treated with methylphenidate hydrochloride controlled release (Biphentin) and lisdexamfetamine (Vyvanse). The unusual acute adverse effect, altered accommodation leading to a decline in visual acuity, emphasizes the importance of considering any change in vision following the introduction of psychostimulant medication as a potential adverse effect. This case highlights the importance of pharmacovigilance especially in paediatrics where data are lacking

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Pharmacoepidemiol Drug Saf. 2019;28:368-69.
IN UTERO OPIOID EXPOSURE AND RISK OF ADHD IN CHILDHOOD: A SCANDINAVIAN REGISTRY STUDY.
Handal M, Skurtveit S, Odsbu I, et al.
Background: Prescriptions for opioid analgesics increased sharply over the past two decades. Knowledge about long-term consequences of in utero exposure to opioids is scarce.
Objectives: The aim of this study was to examine the association between prenatal exposure to opioids and risk of ADHD in childhood a) in population of women with a history of chronic opioid prior to pregnancy and b) among short- and long- term opioid users.
Methods: We used data from nationwide health registers in Norway and Sweden, and linked data using personal identification numbers. We identified exposure to opioids (ATC code N02A) from the Prescription Databases. ADHD was identified as an ADHD diagnosis (ICD-10 F90) in specialist health care system or at least one ADHD drug dispensed. a) Among women with chronic opioid analgesic exposure one year prior to pregnancy start (n = 6 202), we compared those who continued to use opioids during pregnancy (filled 30 Defined Daily Doses (DDD) or more during pregnancy) (n = 3178) with discontinuers (no opioid prescriptions during pregnancy) (n = 3024). b) We studied dose-response by comparing long-term (30 DDD or more) (n = 8224) with short-term (less than 30 DDD) (n = 38 578) analgesic opioids in-utero exposure. We followed the cohorts of live born infants up the age of ten years. The association between exposure and the cumulative risk of ADHD was analyzed using Cox proportional hazard regression, with attained age as the time scale.

Inverse probability of treatment weights based on the propensity scores was applied to adjust for measured confounders.
Results: a) The mean follow-up time after age of three was 3.3 years in the exposed group and 3.4 years in the discontinuers. There were 110 ADHD cases (3.5%) in the opioid exposed group and 61 (2.0%) in the discontinuer group. The unadjusted HRs for the risk of ADHD was 1.77 (95% Confidence Interval 1.29 to 2.41). After adjustment the HR decreased to 1.16 (0.72 to1.85). b) In the comparison between short and long term use of opioids during pregnancy the unadjusted HRs for the risk of ADHD was 1.77 (1.51 to 2.08). After adjustment the HR decreased to 1.43 (1.18 to1.72).
Conclusions: We did not observe increased risk of ADHD among children of women who used opioids long-time during pregnancy when compared with children of opioid discontinuers. Analysis of dose- response indicated increased risk among long-term exposed when compared to short-term exposed. Short-time users may use small amounts of opioids and be quite similar to the general pregnant population. Increased risk of ADHD in long term compared to short term exposed children might thus be a result of residual confounding

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Pharmacoepidemiol Drug Saf. 2019;28:448-49.

PSYCHOTROPIC DRUG PRESCRIBING TO CHILDREN WITH ATTENTION DEFICIT/HYPERACTIVITY DISORDER IN THE UNITED STATES, 2002-2016.

Horton DB, Strom BL, Taylor MT, et al.

Background: Use of ADHD drugs has been increasing in many countries, and prior studies of antidepressant and antipsychotic drugs have identified ADHD as a common reason for off-label usage. However, few comprehensive studies of psychotropic drug use have been performed for children with ADHD.
Objectives: To describe the extent and trends of prescribed non- ADHD psychotropic drugs for children with ADHD in the US and to evaluate how conduct disorder (CD) affects prescribing.
Methods: We used the National Ambulatory Medical Care Surveys (2002-2016) and outpatient National Hospital Ambulatory Medical Care Surveys (2002-2011), which provide nationally representative cross-sectional, visit-level data on demographics, diagnoses, and drugs ordered in outpatient clinics in the US. The study included all survey visits for children <18 excluding those for diagnoses or reported symptoms of anxiety, autism, bipolar disorder, depression, epilepsy/ seizures, psychosis, or substance misuse/abuse. We identified visits for ADHD using ICD-9-CM codes and visits for CD based on ICD-9- CM and reported symptoms. Antidepressants (AD), antiepileptics, antipsychotics (AP), and anxiolytics were grouped as non-ADHD psychotropic drugs. We compared rates of prescribing among groups with and without ADHD and/or CD using chi-square tests, accounting for the complex survey design. Trends were evaluated through logistic regression of elapsed time ([survey year-2002]/15) on drug class, adjusted for age, sex, race, ethnicity, insurance, setting of care, and presence of CD.
Results: Physicians prescribed non-ADHD psychotropic drugs at 9.8% of visits for ADHD alone and 28.3% of visits for ADHD + CD, compared to 7.7% of visits for CD alone and 1.2% of visits without ADHD or CD. Including ADHD drugs, ΓëÑ2 psychotropic drugs were prescribed at 19.1% of visits for ADHD and 32.8% of visits for ADHD + CD. Among non-ADHD psychotropic drugs, antidepressants were most commonly prescribed at visits for ADHD alone (5.9%), while antipsychotics were most commonly prescribed at visits for ADHD + CD (14.7%). Analyses suggested trends of increasing AD use (OR 1.8, 95% CI 0.7, 4.9) and decreasing AP use (OR 0.5, 95% CI 0.2, 1.5) over time.
Conclusions: US physicians frequently prescribe non-ADHD psychotropic drugs off-label to children with ADHD even in the absence of documented neuropsychiatric diagnoses or symptoms. Prescribing rates of these drugs are substantially higher for children with documented comorbid CD. More research is needed to understand the reasons for these prescribing patterns and their impact on outcomes

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Pharmacoepidemiol Drug Saf. 2019;28:370-71.

RISK OF ATTENTION DEFICIT HYPERACTIVITY DISORDER IN CHILDHOOD AFTER EXPOSURE TO SEROTONERGIC ANTIDEPRESSANTS IN PREGNANCY.

Lupattelli A, Mahic M, Handal M, et al.

Background: The time-dependent effect of prenatal exposure to serotonergic antidepressants on attention deficit hyperactivity disorder (ADHD) risk remains unresolved.

Objectives: To quantify the effect of time-varying prenatal exposure to serotonergic antidepressants on ADHD risk in childhood, as clinical diagnosis and parent-reported symptoms.

Methods: We used data from the Norwegian Mother and Child Cohort Study, the Medical Birth Registry, the Prescription Database, and the Patient Registry of Norway, limited to women with depressive/ anxiety disorders in pregnancy. The windows of self-reported antidepressant exposure were mid (week 16-28) and late pregnancy (> week 28). Symptoms of ADHD at 5 years were parent-reported via the Conners' Parent Rating Scale-Revised; ADHD diagnoses were retrieved from the specialist health care system, the Patient Registry (ICD-10 F90). We fit general linear and Cox marginal structural models (MSM) to account for time-varying exposure and confounders (depressive/anxiety symptoms as measured by SCL, co-medication with other psychotropics and analgesics), and time-fixed maternal and paternal factors.

Results: We included 3232 pregnancy-child dyads within women with self-reported depressive/anxiety disorders in pregnancy. Overall, 481 (14.9%) children had been prenatally exposed to serotonergic antidepressants and 90 children (2.8%) had a clinical diagnosis for ADHD. Relative to children born to women with non-medicated depression/ anxiety (n = 2751), those exposed to serotonergic antidepressants in mid (weighted HR: 1.74, 95% CI: 0.41-7.15) or late pregnancy (weighted HR: 1.66, (0.41-6.82)) did not have an increased risk for an ADHD diagnosis. Likewise, there were no differences on symptoms of ADHD according to timing of exposure (midpregnancy: weighted +¦: -0.02, 95% CI: -0.30, 0.34; late pregnancy:weighted +¦: -0.04, (-0.32, 0.25)).

Conclusions: In a population of children born to women with depressive/ anxiety disorders in pregnancy, there was no evidence for a substantial association between prenatal exposure to serotonergic antidepressants at different timings in pregnancy, and risk for ADHD symptoms and diagnosis. However, we were unable to confirm or refute whether a smaller increased risk exists

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Pharmacoepidemiol Drug Saf. 2019;28:275-76.

REAL-WORLD TREATMENT PATTERNS AMONG ATTENTION-DEFICIT/HYPERACTIVITY DISORDER PATIENTS WHO INITIATED EXTENDED-RELEASE TREATMENT.

Erensen J, Wang X, Ding Y, et al.

Background: Attention-deficit/hyperactivity disorder (ADHD) affects 7.8%-11.0% of children and 4.4% of adults in the U.S. Extendedrelease (ER) and immediate-release (IR) medications are commonly prescribed for ADHD, with ER formulations gaining popularity in recent years.

Objectives: To assess the real-world treatment patterns of ER ADHD medications among commercially-insured adolescents and adults in the U.S.

Methods: Patients aged ΓëÑ12 years with 1 ADHD diagnosis and 2 ER or IR prescriptions (covering ΓëÑ60 days within the first 90 days of treatment) were identified in a large US claims database from 2011 to 2017. Patients had 6 months of continuous enrollment preand 12 months post-treatment initiation and were followed until discontinuation (60-day treatment-free interval), enrollment end or 24 months post treatment initiation. Patients were untreated within the 6-month baseline period and grouped based on the first recorded treatment as ER monotherapy, IR monotherapy or ER/IR combination.

Results: A total of 209,342 ADHD patients (49.7% female, median age 24 years) met the study inclusion criteria. Of these, 127,362 (60.8%) initiated with ER, 80,600 (38.5%) with IR and 1,380 (0.7%) with ER/ IR combination. Of patients that initiated ER, 15,599 (12.2%) switched to or added another ER, 12,333 (9.7%) switched to IR or multiple IR, and 5,898 (4.6%) added an IR to an ER regimen. The median time on ER therapy prior to any modification was 165 days. The most frequent therapy modifications were generic ER amphetamine salts to Adderall XR (16.5%) and from Vyvanse to generic ER amphetamine salts (11.3%). The proportion of ER patients who switched or modified an existing regimen increased with age among adults <40. The median age for modifiers was 25 while those that remained on therapy was 22 ($p < .001$). The five

most prevalent comorbidities of these patients are depression (23.5%), anxiety (6.6%), insomnia (3.7%), bipolar disorder (3.1%), and substance use disorder (2.9%). Depression (28.0% vs 21.9%, p < .001), anxiety (8.2% vs 6.0%, p < .001) and insomnia (4.6% vs 3.4%, p < .001) were significantly higher in patients who modified their regimen.
Conclusions: In this population, a higher number of patients were initially treated with ER compared to IR therapy and more likely to remain on the same treatment they initiated for the duration of the study. Most ER patients who modified their regimen switched to another ER. Age and the presence of psychological comorbidities may play a role in the treatment management of certain ADHD patients. Purdue Pharma LP funded this research

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Pharmacoepidemiol Drug Saf. 2019;28:456-57.

RACIOETHNIC AND PROVIDER SPECIALTY DIFFERENCES IN ADHERENCE TRAJECTORIES AMONG MEDICAID INSURED CHILDREN WITH ATTENTION DEFICIT HYPERACTIVITY DISORDER.

Earla JR, Abugosh S, Chen H.

Background: Medication adherence among children with attention deficit hyperactivity disorder (ADHD) is known to be strongly associated with patients' race/ethnicity.
Objectives: To examine the racioethnic disparities in adherence trajectories among children with ADHD (6-12 years) and to assess the role of providers' specialty in explaining the disparities.
Methods: A retrospective longitudinal observational study was conducted using 2013-2016 data from a large pediatric Managed Care Plan in Texas that covered more than 400,000 Medicaid enrolled children and adolescents. Children aged 6-12 years with an ADHD diagnosis (ICD-9-CM code 314.XX or ICD-10-CM code F90.9) and a prescription for ADHD were first identified, and of which, those who met the initiation follow-up criteria of the Healthcare Effectiveness Data Information Set (HEDIS) were included in the analysis. The adherence pattern for 300 days after receiving the first ADHD prescription, was examined using group-based trajectory modeling. A multivariable multinomial logistic regression was performed to evaluate the association of race/ethnicity and provider specialty with the adherence trajectory group.
Results: The 3,083 patients who met the inclusion criteria were modeled into 3 different adherence trajectory groups (Complete adherers-4.12%, Rapid decliners/discontinuers-76.35%, and Slow decliners-19.53%). Racial differences across the 3 trajectories were noted. Compared to Caucasians, Hispanics were 3.51 times more likely to be rapid decliners/discontinuers (Odds ratio [OR] 3.51, 95% Confidence Interval [CI] 2.28-5.40); whereas African Americans were 6.41 times (OR 6.41, 95% CI 6.41-11.72) more likely to be rapid decliners/discontinuers and 3.2 times (OR 3.2, 95% CI 1.74-5.91) more likely to be slow decliners, respectively. Further, children who consulted by psychiatrists were 41% (OR 0.58, 95% CI 0.39-0.87) less likely to be rapid decliners/ discontinuers than those who consulted by primary care physicians or others. Children who received combination therapy compared to monotherapy were 94% (OR 0.06, 95% CI 0.04-0.09) less likely to be rapid decliners/discontinuers and 36% (OR 0.64, 95% CI 0.41-0.99) less likely to be slow decliners. There was no interaction effect between race/ethnicity with physician specialty.
Conclusions: There were significant racioethnic and provider specialty differences across patients in different ADHD medication adherence trajectories. However, the racioethnic differences were not associated with the access to mental health specialists

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Pharmacoepidemiol Drug Saf. 2019;28:174.

DOES GEOGRAPHIC ACCESS TO PROVIDERS MATTER FOR PEDIATRIC ADHD TREATMENT ENGAGEMENT AND MEDICATION ADHERENCE?

Upadhyay N, Aparasu R, Rowan PJ, et al.

Background: ADHD management requires frequent provider visits that may put a significant travel burden on families of children with ADHD.
Objectives: To examine the impact of geographic access to providers on ADHD treatment engagement and medication adherence in children and adolescents with newly diagnosed ADHD.

Methods: A retrospective cohort study was conducted using the 2013-2016 claims data from a Medicaid Managed Care plan active in the area around Houston. Individuals aged 4-18 years with an incident ADHD diagnosis were identified. Geographic access measures used were: a) Travel distance to the provider who made ADHD diagnosis/initiated the treatment, defined as the shortest route calculated from Google Maps. b) Primary care providers (PCP) density per 10,000 residents within a 5-mile travel distance radius from the population center of each patient's zip code; and c) mental health specialist density. Density was calculated by geographic information system based floating catchment method using ArcGIS. Patients were followed for 3 months post-index ADHD diagnosis to assess the treatment engagement defined as receiving 2 sessions of psychotherapy for ADHD, 2 ADHD prescriptions or both. Among those who were engaged in pharmacotherapy, treatment adherence was assessed using proportion of days covered (PDC) within 300 days post-index prescription. Multivariate logistic regression was conducted to test the association between the geographic access measures and the odds of treatment engagement and medication adherence.
Results: A total of 10,206 cases with an incident ADHD diagnosis were identified, of which 62% had access to 5 PCPs and 82% had access to ΓëÑ1 specialist within 5 miles of travel distance. PCPs initiated the treatment in Γê+70% cases and nearly a half traveled 5 to 15 miles to the providers who initiated their ADHD treatment. The treatment engagement rate was 55% and the mean PDC was 0.54 (-¦0.24) among those engaged in treatment. None of the geographic access measures were significantly associated with ADHD treatment engagement and treatment adherence (e.g. effect of travel distance on treatment engagement: 5-15 miles vs <5 miles: OR = 1.17, 95% CI [0.93- 1.47]; >15 miles vs <5 miles: OR = 1.19, 95% CI [0.93-1.52] and effect of PCP density on treatment engagement: 5-10 PCP vs < 5 PCP: OR = 0.96, 95% CI [0.72-1.27]; >10 PCP vs < 5 PCP: OR = 1.18, 95% CI [0.90-1.54]).
Conclusions: Different from the treatment for pediatric depression, a significant geographic access barrier was not found in the care for pediatric ADHD. This may be due to PCPs' in-depth participation in ADHD diagnosis and treatment

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Pharmacoepidemiol Drug Saf. 2019;28:31.

EXPOSURE TO ANTIDEPRESSANTS DURING PREGNANCY AND THE RISK OF ATTENTION DEFICIT HYPERACTIVITY DISORDER IN OFFSPRING: FINDINGS FROM A NATIONWIDE COHORT STUDY WITH AND WITHOUT SIBLING DESIGN.

Pedersen L, Ehrenstein V, et al.

Background: Attention deficit hyperactivity disorder (ADHD) is a serious disease. Recent studies have suggested an association between maternal use of antidepressants during pregnancy and elevated risk of ADHD in offspring. However, the findings may be confounded by unmeasured socioeconomic or genetic factors.
Objectives: To examine the association between maternal use of antidepressants during pregnancy and the risk of ADHD in offspring by using a classical cohort design and a sibling design.
Methods: We included all singleton live-born infants in Denmark in 1997-2016. In a classical cohort design, we examined the association by applying three models with increasing number of confounders included for control: 1) a crude model (no adjustment), 2) a model controlling for birth- and disease-related factors, and 3) a model with additional control for socioeconomic factors. In a sibling design, we compared the outcome in exposure-discordant siblings, thus removing confounding by shared risk factors. In addition, we adjusted for covariates that could vary among siblings. As sensitivity analyses we performed former vs. current user comparison and unconditional sibling comparison. In addition, as a negative control analysis we performed paternal exposure analysis. In all analyses, we used Cox regression to calculate hazard ratios (HRs) for the risk of ADHD in offspring contrasting those with vs. those without exposure to antidepressants during gestation.
Results: The overall population consisted of 1,223,201 live-born singletons. The sibling population consisted of 30,578 siblings discordant for maternal use of antidepressants. The three models in the cohort design resulted in HRs of 2.09 (95% CI 1.92; 2.26), 1.46 (95% CI 1.32; 1.61) and 1.47 (95% CI 1.32; 1.65), respectively. The adjusted model in the sibling design resulted in a HR of 1.20 (95% CI 0.93; 1.54). The sensitivity analysis of former vs. current user comparison resulted in a HR of 1.19 (95% CI 1.06; 1.33) and the unconditional sibling comparison in 1.20 (95% CI 1.00; 1.45). The negative control paternal exposure analysis resulted in a HR of 1.17 (95% CI 1.05; 1.29).

Conclusions: There was an association between maternal use of antidepressants during pregnancy and the risk of ADHD in offspring in the classical cohort design. This association was attenuated when a sibling design was used, suggesting presence of uncontrolled confounding

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Pharmacoepidemiol Drug Saf. 2019;28:371.

PRENATAL ANTIBIOTICS USE AND THE RISK OF ATTENTION DEFICIT HYPERACTIVITY DISORDER.

Hamad A, Alessi-Severini S, Mahmud S, et al.

Background: Prenatal antibiotic exposure induces changes in infants' gut microbiota composition and is a possible contributor in the development of Attention-Deficit/Hyperactivity Disorder (ADHD).

Objectives: In this study, we examined the association between prenatal antibiotic exposure and the risk of ADHD.

Methods: This was a population-based cohort study that included 187,605 children born in Manitoba, Canada between April 1, 1998 and March 31, 2017. Exposure was defined as having filled one or more antibiotic prescription during pregnancy. The outcome was ADHD diagnosis identified in hospital abstracts, physician visits or drug dispensations. Risk of developing ADHD was estimated using Cox proportional hazards regression models in a high dimensional propensity scores-matched cohort and an exposure-discordant sibling cohort. Several sensitivity analyses were planned to test the robustness of the risk estimates.

Results: A total of 102,974 children were included in the matchedcohort. During a follow-up of 1,098,717 person-years, 9717 (9.4%) children received an ADHD diagnosis. Prenatal antibiotic exposure was associated with increased ADHD risk (HR 1.14, 95% CI 1.09- 1.19). The highest risk was observed in those receiving 3 or more antibiotic courses or for a duration longer than 2 weeks (HR 1.37, 95% CI 1.19-1.58 and HR 1.28, 95% CI 1.16-1.42, respectively). In the sibling cohort of 64,019 children, prenatal antibiotic exposure was associated with a small increase in the risk of ADHD, though it was not statistically significant (HR 1.06, 95% CI 0.98-1.14).

Conclusions: Prenatal antibiotic use appears to increase the risk of developing ADHD. However, much of this risk may have been overestimated as a result of unmeasured confounding by genetic and shared familial factors. Cautious interpretation of study finding is warranted

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Pharmacoepidemiol Drug Saf. 2019;28:41.

RISK OF PSYCHOSIS WITH AMPHETAMINE VERSUS METHYLPHENIDATE IN ATTENTION DEFICIT HYPERACTIVITY DISORDER.

Moran LV, Ongur D, Hsu J, et al.

Background: The use of prescription stimulants amphetamine and methylphenidate for the treatment of attention deficit hyperactivity disorder (ADHD) is increasing. In 2007, the US Food and Drug Administration mandated changes to stimulant prescribing labels based on findings of new-onset psychosis in patients without pre-existing disease. Although these changes were mandated over 10 years ago, there has been no systematic study of the comparative risk of psychosis between amphetamine and methylphenidate.

Objectives: We sought to compare the risk of psychosis in adolescents and young adults with ADHD who are new users of amphetamine versus methylphenidate.

Methods: This is a cohort study of patients 13-25 years old with an outpatient diagnosis of ADHD from two commercial insurance claims databases (Optum Clinformatics and IBM Marketscan) who started taking amphetamine or methylphenidate between January 1, 2004 and September 30, 2015. The outcome was a diagnosis of psychosis requiring treatment with an antipsychotic medication within 60 days of initial psychosis diagnosis. We used 1:1 propensity score (PS) matching to match patients on a set of 50 covariates measuring ADHD severity, psychiatric comorbidity, psychotropic medication use, substance use and healthcare utilization. For the pre-specified primary analysis, we estimated hazard ratios (HR) in PS-matched patients and then pooled results across the two databases using fixed effects meta-analysis.

Results: A total of 221,846 participants in the propensity score matched subsets with 143,286 person-years of follow-up experienced 343 psychotic events (2.4 per 1,000 person-years). Use of amphetamine tripled

over the study period with preferential prescribing of amphetamine to older patients. The majority of patients were prescribed stimulants by family/internal medicine physicians, who had the highest prescribing rates of amphetamine (72.5%) compared to pediatricians (51.6%) and psychiatrists (63.7%). Use of amphetamine was associated with an increased risk of psychosis based on 237 psychotic events in amphetamine users and 106 psychotic events in methylphenidate users (HR 1.65, 95% CI 1.31 to 2.09).
Conclusions: Amphetamine use is associated with an increased risk of treatment-emergent psychosis compared to methylphenidate among adolescents and young adults with ADHD

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Pharmacoepidemiol Drug Saf. 2019;28:406.

EARLY CHILDHOOD ANTIBIOTICS USE AND THE RISK OF ATTENTION-DEFICIT/HYPERACTIVITY DISORDER: A POPULATION-BASED COHORT STUDY.

Hamad A, Alessi-Severini S, Mahmud S, et al.

Background: Early childhood antibiotic exposure induces changes in infants' gut microbiota composition reportedly associated with the development of Attention-Deficit/Hyperactivity Disorder (ADHD).
Objectives: In this study, we examined the association between antibiotic use in the first year of life and the risk of ADHD.
Methods: This was a population-based cohort study utilizing the Manitoba Population Research Data Repository. The cohort included 187,605 children born in Manitoba, Canada between April 1, 1998 and March 31, 2017. Exposure was defined as having filled one or more antibiotic prescriptions during the first year of life. The outcome was ADHD diagnosis identified in hospital abstracts, physician visits or drug dispensations. Risk of developing ADHD was estimated using Cox proportional hazards regression models in a high dimensional propensity scores-matched cohort and a sibling cohort.
Results: A total of 69,738 children were included in the matchedcohort. During follow-up, 6087 (8.7%) children received an ADHD diagnosis. ADHD risk was not found to be associated with antibiotic exposure in early life (HR 1.02, 95% CI 0.97-1.08). In secondary analyses, an association was observed in those receiving three or more antibiotic courses or for a duration longer than three weeks (HR 1.57, 95% CI 1.23-2.00 and HR 1.38, 95% CI 1.17-1.64, respectively). In the sibling cohort of 67,671 children, antibiotic exposure was not associated with the risk of ADHD (HR 0.96, 95% CI 0.89-1.03). No association was observed in any of the secondary analyses.
Conclusions: Antibiotic use in the first year of life does not appear to pose an ADHD risk on a population level

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PLoS ONE. 2019;14.

TO EAT OR NOT TO EAT: REWARD DELAY IMPULSIVITY IN CHILDREN WITH LOSS OF CONTROL EATING, ATTENTION DEFICIT / HYPERACTIVITY DISORDER, A DOUBLE DIAGNOSIS, AND HEALTHY CHILDREN.

Munsch S, Dremmel D, Wilhelm P, et al.

Reward delay impulsivity is a feature of attention deficit/hyperactivity disorder (ADHD) and a likely feature of loss of control eating (LOC-E), which might explain the higher risk of children with ADHD or LOC-E to become obese. The goal of this study was to investigate reward delay impulsivity in children with LOC-E, ADHD, or a double diagnosis, in contrast to healthy children. Children (8 to 13 years) with LOC-E (n = 24), ADHD (n = 33), a double diagnosis (n = 9), and healthy children (n = 34) performed a computer game (door opening task [DOT]) and the delay of gratification task (DoGT) to assess food related facets of reward delay impulsivity. In addition, children reported whether they worried to lose control over eating during the DoGT. There were no group differences in the DOT. However, children with ADHD or a double diagnosis had a significantly higher risk to eat prematurely during the DoGT than children with LOC-E, who were not significantly different from healthy children. Children with a double diagnosis were most likely to worry about losing control over eating during the DoGT, followed by children with LOC-E, and both had a significantly higher probability to worry than healthy children. For children with a double diagnosis the probability to worry was significantly higher than for children with ADHD. If replicated, these findings point to a special relevance

of reward delay impulsivity in children with ADHD or a double diagnosis, compared to children with LOC-E. ADHD should be regularly assessed in children with LOC-E

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Pril (Makedon Akad Nauk Umet Odd Med Nauki). 2018 Dec;39:5-19.

INTER- AND INTRA-HEMISPHERIC EEG COHERENCE STUDY IN ADULTS WITH NEUROPSYCHIATRIC DISORDERS.

Markovska-Simoska S, Pop-Jordanova N, Pop-Jordanov J.

Functional connectivity between different regions of the brain in the resting state has been a recent topic of interest in neurophysiological research. EEG coherence happened to be an useful tool for measuring changes in neuro-psycho-physiological functioning which are not detectable by simply measuring amplitude or power spectra. The aim of our study was to investigate the changes in the EEG coherence in groups of different mental disorders such as: depression, general anxiety disorder, ADHD, Asperger syndrome and headaches, compared to control group. All measures were made in two conditions: eye opened (EO) and eyes closed (EC). The obtained results show that in EO condition there is a significantly lower coherence for delta waves between analyzed groups. For theta coherence only for Asperger syndrome we found lower coherence compared to control group, ADHD and headaches in parietal region (P3-P4). Obtained results for intrahemispheric coherence have shown that there was significantly lower coherence in both conditions for delta and theta bands in almost all sites for Asperger's syndrome, and opposite increased intrahemispheric coherence for patients with headaches (for delta band in the anterior regions and for theta band in the posterior regions). ADHD patients expressed lower delta inter-hemispheric coherence in frontal regions, and increased coherence of theta in central regions but increased delta coherence in posterior regions only in EO condition. For depressive and anxiety patients we found decreased intrahemispheric coherence for EO condition for delta brain waves all over the cortex. Concerning the coherence in anxiety patients in our current study we have obtained hypo coherence in centro-parieto-occipital region only for delta in inter-hemispheric coherence and also lower delta coherence through the cortex for intrahemispheric coherence. Our findings for interhemispheric hyper coherence in subjects with depression specifically for alpha and beta bands were confirmed in other studies. We suggest that EEG coherence analysis could be a sensitive parameter in the detection of electrophysiological abnormalities in patients with anxiety, depression, ADHD, Asperger syndrome and headaches. These results can confirm the development of QEEG state and trait biomarkers for psychiatric disorders

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Psychiatr Serv. 2018 Jun;69:716-22.

PSYCHOTROPIC POLYPHARMACY AMONG YOUTHS WITH SERIOUS EMOTIONAL AND BEHAVIORAL DISORDERS RECEIVING COORDINATED CARE SERVICES.

Wu B, Bruns EJ, Tai MH, et al.

OBJECTIVE: The study examined differences in psychotropic polypharmacy among youths with serious emotional and behavioral disorders who received coordinated care services (CCS) that used a wraparound model and a matched sample of youths who received traditional services.

METHODS: A quasi-experimental design compared psychotropic polypharmacy one year before and one year after discharge from CCS. The cohort was youths with serious emotional and behavioral disorders who were enrolled in CCS from December 2009 through May 2014. The comparison group was youths with serious emotional and behavioral disorders who received outpatient mental health services during the same time. Administrative data from Medicaid, child welfare, and juvenile justice services were used. A difference-in-difference analysis with propensity score matching evaluated the CCS intervention by time effect on psychotropic polypharmacy.

RESULTS: In both groups, most youths were male, black, and 10-18 years old, with attention-deficit hyperactivity disorder (54%-55%), mood disorder (39%-42%), depression (26%-27%), and bipolar disorder (25%-26%). About half of each group was taking an antipsychotic. The percentage reduction in polypharmacy from one year before CCS enrollment to one year after discharge was 28% for the CCS group and 29% for the non-CCS group, a nonsignificant difference. CCS youths excluded from the analysis had more complex

mental health needs and a greater change in polypharmacy than the CCS youths who were included in the analytic sample.
CONCLUSIONS: Mental health care coordination had limited impact in reducing psychotropic polypharmacy for youths with less complex mental health needs. Further research is needed to evaluate the effect on psychotropic polypharmacy among youths with the greatest mental health needs

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Psychiatry and Clinical Psychopharmacology. 2019;29:326-31.
THE RELATION BETWEEN SERUM TOXOPLASMA GONDII IGG ANTIBODY IN CHILDREN AND ADHD AND ITS SEVERITY.
Akaltun, Kara T, Ayayd-¦n H, et al.
AIM: The purpose of our study was to investigate the relation between serum Toxoplasma gondii IgG antibodies in children and attention deficit hyperactivity disorder (ADHD) and its severity.
METHOD: 214 subjects, consisting of 107 children aged 6ΓÇô18 and diagnosed with ADHD and 107 children with no ADHD or psychiatric pathology were included. Subjects underwent a detailed psychiatric examination based on DSM-V-TR diagnostic criteria, using a data form, the Kiddie Schedule for Affective Disorders and Schizophrenia Present and Lifetime Version (K-SADS-PL) for School-Aged Children (6ΓÇô18), the DuPaul ADHD Rating Scale, Parent Rating Scale, the Conners Teacher Rating Scale (CTRS), and the Conners Parent Rating Scale (CPRS). Blood anti-Toxoplasma IgG antibody levels were investigated. The data obtained were then subjected to statistical analysis.
RESULTS: T. gondii IgG antibodies were positive in 8 (7.47%) of the case group and positive in 3 (2.8%) of the control group. No statistically significant difference was determined between the case and control groups in terms of T. gondii IgG positivity (p =.215). Higher levels of severe ADHD were determined in Toxoplasma IgG positive patients in the ADHD group compared to Toxoplasma IgG negative subjects, the difference being statistically significant (p =.005).
CONCLUSION: No significant differences were determined between the case and control groups in terms of T. gondii IgG positivity and ADHD. However, correlation was determined between ADHD severity and T. gondii IgG positivity

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Psychiatr Invest. 2019;16:425-32.
ATTENTION-DEFICIT/HYPERACTIVITY DISORDER SYMPTOM CHARACTERISTICS IN KOREAN ELEMENTARY SCHOOL CHILDREN: COMPARISON WITH US POPULATION.
Choi HW, Choi C-H, Lim MH, et al.
Objective Attention-deficit/hyperactivity disorder (ADHD) is a common neurodevelopmental disorder in elementary school children. The present study investigated the characteristics of ADHD in Korean elementary school children using the Korean version of the ADHD Rating Scale (K-ARS). The data was compared with those obtained from a comparable American population.
Methods Participants included 29,914 elementary school children, aged 6-12 years, from a medium-sized city. The parents completed the home version of the K-ARS. The total and subscale-specific normative data and sex- and age-related mean score differences were analyzed. These data were compared with those obtained from the American population using independent t-tests.
Results Mean total and subscale K-ARS scores were significantly higher among boys (vs. girls) and younger children aged equal to or less than 8 years old (vs. older children). Mean scores on the hyperactivity-impulsivity subscale were lower than those of American children, but similar to another Korean sample.
Conclusion Our data characterized ADHD symptoms in Korean children. However, further studies are needed to identify the cultural differences underlying ratings of ADHD symptom severity

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Psychiatry Res Neuroimaging. 2019;292:13-22.

NEURAL REWARD PROCESSING IN PAEDIATRIC TOURETTE SYNDROME AND/OR ATTENTION-DEFICIT/HYPERACTIVITY DISORDER.

Akkermans SEA, Van RD, Naaijen J, et al.

Attention-deficit/hyperactivity disorder (ADHD) is the most common comorbidity in individuals with Tourette syndrome (TS). Yet, it is unclear to what extent TS and ADHD show overlapping or distinct neural abnormalities. ADHD has been associated with altered reward processing, but there are very few studies on reward processing in TS. This study assessed neural activation of basal ganglia and thalamus during reward anticipation and receipt in children with TS and/or ADHD. We analysed mean activations of a priori specified regions of interest during an fMRI monetary incentive delay task. Data was used from 124 children aged 8ΓÇô12 years (TS n = 47, of which 29 had comorbid ADHD; ADHD n = 29; healthy controls n = 48). ADHD severity across ADHD and TS groups and healthy controls was marginally related to hypoactivation of the right nucleus accumbens during reward anticipation; this effect was not moderated by TS diagnosis. We detected no associations of neural activation with TS. The association between ADHD severity and hypoactivation of the right nucleus accumbens during reward anticipation, independent of the presence or absence of TS, is in line with the view of nucleus accumbens hypoactivation as a dimensional, neurofunctional marker of ADHD severity, transcending the boundaries of primary diagnosis

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Psychiatry Res. 2019;281.

SOCIAL ANXIETY IS ASSOCIATED WITH POORER PEER FUNCTIONING FOR GIRLS BUT NOT BOYS WITH ADHD.

Becker SP, Kneeskern EE, Tamm L.

There is mixed evidence for whether or not co-occurring anxiety is associated with poorer peer functioning in children with attention-deficit/hyperactivity disorder (ADHD), which may be partly due to studies typically using a global measure of anxiety and failing to consider possible sex differences. The present study examined child-reported social anxiety in relation to peer functioning and whether this association differs by sex in 93 children (66% male; ages 8ΓÇô12) with ADHD. Children, parents, and teachers completed a measure of social acceptance, and teachers also completed measures of asociality, peer exclusion, peer dislike, and peer ignoring. Regression analyses examined the interaction between social anxiety and sex in relation to the peer functioning variables, with age, race, ADHD subtype, and oppositional defiant disorder symptoms included as covariates. Social anxiety was associated with lower parent-reported social acceptance, with no sex differences in the association. However, significant interaction effects were found for child- and teacher-rated social acceptance, as well as peer exclusion and peer ignoring such that social anxiety was associated with less competence, more exclusion, and greater ignoring for girls but not boys. Findings indicate that social anxiety is associated with poorer peer functioning for girls more so than boys with ADHD

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Psychiatry Res. 2019.

ASSESSING AUTISM IN FEMALES: THE IMPORTANCE OF A SEX-SPECIFIC COMPARISON.

Lundstram S, et al.

Autism spectrum disorder (ASD) is diagnosed more often in boys than girls. Here, we compared the degree of autism - and related disorders - symptomatology in boys and girls with a registered diagnosis of ASD. We used parent telephone interview A-TAC (Autism-Tics, ADHD and other Comorbidities) ratings of 30,392 twins aged 9 or 12 (including 308 boys and 122 girls with National Patient Register diagnoses of ASD) participating in the Child and Adolescent Twin Study in Sweden. We used z-scores for ASD-symptoms, standardized separately for boys and girls. Boys with a diagnosis of ASD had a higher raw mean score than girls with a diagnosis on the A-TAC ASD domain. However, utilizing the z-scores, girls with a diagnosis of ASD deviated further away from the female population mean than did the boys with ASD from the male population mean. Girls also had higher standardized mean values for symptoms of Attention-Deficit/Hyperactivity Disorder, Learning Disabilities and Oppositional Defiant Disorder. The findings suggest that girls diagnosed with autism may represent an even more extreme end of the female population autistic features distribution, than

diagnosed boys from the male population autistic features distribution. Future studies may benefit from examining the use of sex-specific cut-off scores

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Psychoneuroendocrinology. 2019;107:49.

CORTISOL, INFLAMMATORY BIOMARKERS AND NEUROTROPHINS IN CHILDREN AND ADOLESCENTS WITH ATTENTION DEFICIT HYPERACTIVITY DISORDER (ADHD).

Pariante CM.

Background: Hypothalamus-Pituitary-Adrenal (HPA) axis dysregulation, inflammation and imbalance of neurotrophins have been suggested in attention deficit hyperactivity disorder (ADHD). Several studies reported abnormal levels of cortisol, inflammatory biomarkers and neurotrophins in youth with ADHD, but the results have not been conclusive. The aim of this study is to investigate the levels of salivary cortisol across 4-time points, and plasma inflammatory biomarkers and neurotrophins, in youth with ADHD and typically developing youth (TD).

Methods: We conducted a case-control study measuring saliva cortisol levels at 4 different time points throughout the day (at awakening, noon, 1800 h and bedtime) and morning plasma levels of inflammatory and neurotrophin biomarkers in youth with ADHD (n = 98, mean age 9.32 + 3.05 years) and TD (n = 21, mean age 9.19 + 2.96 years).

Results: Our study showed that youth with ADHD had lower levels of bedtime salivary cortisol. Moreover, they had higher levels of plasma C-reactive protein (CRP) and interleukin (IL)-6, but lower plasma tumor necrosis factor-alpha (p =.009). Finally, lower brain-derived neurotrophic factors (BDNF) (p <.0001). Children with the combined disorder (with Inattention, Hyperactivity and Impulsivity all present) had the lowest awakening and bedtime salivary cortisol levels (p <.05 to.01).

Conclusion: The lower bedtime salivary cortisol levels and higher levels of inflammatory biomarkers in youth with ADHD further support the role of abnormal HPA axis and inflammation in ADHD. Moreover, the lower levels of BDNF in ADHD also indicate that neurotrophin may be a potential biomarker in this disorder

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Psychoneuroendocrinology. 2019;107:63.

SYMPOSIUM 11: IMPACT OF DIFFERENT CHARACTERISTICS OF EARLY ADVERSITY ON STRESS RELATED ENDOPHENOTYPES AND MENTAL HEALTH PROBLEMS: TIME: SATURDAY, 31/AUG/2019: 8:30AM□ÇÔ10:00AM LOCATION: CARTESIO SESSION CHAIR: ELIF AYSIMI DUMAN SESSION CHAIR: ANDREA DANESE.

Anon.

Early adversity is associated with various stress-related endophenotypes and mental health problems. However, it is difficult to understand these associations due to variations in the characteristics of adversities, their interactions with genotype, and their differential impacts on various endophenotypes. In this symposium, we gather researchers who will investigate these associations in more detail, presenting and discussing data on the impacts of early adversity in children and adolescents from five different countries. The symposium will start with Courtenay Kessler (Northwestern University ΓÇô USA) providing evidence on the differential impact of type and intensity of early and recent adversities on adolescent diurnal cortisol. Isabelle Ouellet-Morin (University of Montreal ΓÇô Canada) will continue discussing the role of different early adversities and their chronicity on hair cortisol levels of adolescents. Afterwards, Elif Aysimi Duman (Bogazici University ΓÇô Turkey) will discuss how apart from adverse life experiences, social contexts, such as chaos at home and daycare, further influence children's daily cortisol. Judith Overfeld (Charit+® Universit+ñtmedizin Berlin ΓÇô Germany) will then present the moderating role of genotype (i.e. FKBP5) on the relationship between early adversity and cortisol reactivity that mediate changes in children's amygdala volume. Afterwards, Alina Rodriguez (University of Lincoln ΓÇô UK) will discuss how early adversity influences emotion and attention problems in childhood, resulting in differential self-regulation behaviors and ADHD symptoms. Discussant Andrea Danese (King's College London ΓÇô UK), will conclude the symposium by discussing different ways

to parse out the mechanisms that link early adversity to later changes in stress-related endophenotypes and mental health problems, while considering methodological issues related to measurement of early adversity

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Radiologia. 2019.

RESTING STATE FUNCTIONAL MAGNETIC RESONANCE IMAGING IN ATTENTION DEFICIT HYPERACTIVITY DISORDER .

Carmona Franceschi MJ, Ascencio Lancheros JL, Ochoa G+¦mez JF, et al.

Objective: To explore whether children and adolescents with attention deficit/hyperactivity disorder (ADHD) have altered the functional connectivity between the executive control network and the default mode network.
Methods: Exploratory study of a diagnostic test, prospective, case and control design. A total of 56 participants were recruited consecutively (29 inattentive or combined ADHD subtype and 27 controls) between 7 and 16 years old, male, right dominance. DSM-5 was applied as reference test and a battery of neuropsychological tests to confirm the diagnosis and assess comorbidities. Resting state functional magnetic resonance imaging was performed as an index test. The application and evaluation of the tests was blind. The brain regions were chosen a priori and the region of interest technique was used. The functional connectivity of the anterior cingulate cortex (ACC) was evaluated with: the precuneus (P), the posterior cingulate cortex (PCC) and the dorsomedial prefrontal cortex (DMPC).
Results: The functional connectivity in each of the associations evaluated in the patients with ADHD compared with the controls were: P_D = 0.41 vs 0.44; CCP_D = 0.43 vs 0.53; CPDM_D = 0.75 vs. 0.79; P_I = 0.40 vs 0.41; CCP_I = 0.48 vs 0.53; CPDM_I = 0.76 vs. 0.72). D: right side I: left side. Value of p > 0.05.
Conclusion: Cerebral functional connectivity at rest is lower in ADHD patients when compared with healthy controls, however, the difference was not statistically significant

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Radiology. 2019;293:186-92.

WHITE MATTER BY DIFFUSION MRI FOLLOWING METHYLPHENIDATE TREATMENT: A RANDOMIZED CONTROL TRIAL IN MALES WITH ATTENTION-DEFICIT/HYPERACTIVITY DISORDER.

Bouziane C, Filatova OG, Schrantee A, et al.

Background: Methylphenidate (MPH) is highly effective in treating attention-deficit/hyperactivity disorder (ADHD). However, not much is known about its effect on the development of human brain white matter (WM).
Purpose: To determine whether MPH modulates WM microstructure in an age-dependent fashion in a randomized double-blind placebo-controlled trial (Effects of Psychotropic Medication on Brain Development-Methylphenidate, or ePOD-MPH) among ADHD referral centers between October 13, 2011, and June 15, 2015, by using diffusion-tensor imaging (DTI).
Materials and Methods: In this prospective study (NTR3103 and NL34509.000.10), 50 stimulant treatment-naive boys and 49 young adult men diagnosed with ADHD (all types) according to Diagnostic and Statistical Manual of Mental Disorders, 4th Edition criteria were randomized to undergo treatment with MPH or placebo for 16 weeks. Before and 1 week after treatment cessation, study participants underwent MRI, including DTI. The outcome measure was change in fractional anisotropy (FA), which was assessed in three regions of interest (ROIs), as well as in a voxel-based analysis in brain WM. Data were analyzed by using intentionto-treat linear mixed models for ROI analysis and a permutation-based method for voxel-based analysis with family-wise error correction.
Results: Fifty boys (n = 25 MPH group, n = 25 placebo group; age range, 10-12 years) and 48 men (n = 24 MPH group, n = 24 placebo group; age range, 23-40 years) were included. ROI analysis of FA yielded no main effect of time in any of the conditions. However, voxel-based analysis revealed significant (P , .05) time-by-medication-by-age interaction effects in several association tracts of the left hemisphere, as well as in the lateral aspect of the truncus of the corpus callosum, due to greater increase in FA (standardized effect size, 5.25) in MPH-treated boys. Similar changes were not present in boys receiving a placebo, nor in adult men.

Conclusion: Four months of treatment with methylphenidate affects specific tracts in brain white matter in boys with attentiondeficit/ hyperactivity disorder. These effects seem to be age dependent, because they were not observed in adults treated with methylphenidate

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Rehabilitation (Stuttg). 2019 Apr;58:121-27.

THE PREVALENCE OF ATTENTION DEFICIT/HYPERACTIVITY DISORDER (ADHD) AMONG ADOLESCENTS IN STATIONARY REHABILITATION.

Ballaschke O, Langer S, Forschner L.

BACKGROUND: ADHD in adulthood is assumed to be a positive predictor for many comorbid diseases and impairments affecting all domains of life, particularly career performance. Participation in social and professional life is limited for populations which qualify for rehabilitation programs, and thus the prevalence of ADHD is presumably also higher in these populations.

METHOD: To estimate the prevalence of ADHD in a population undergoing rehabilitation, 1010 people aged 18 to 75 years were screened for the presence of ADHD in adulthood. Additional impairments were measured and compared to a group of non ADHD participants.

RESULTS: As expected a higher prevalence of ADHD was found in the population undergoing rehabilitation than in the general population (10.5%) Participants with ADHD who had recently begun rehabilitation seemed to have more impairments than non ADHD-participants. Participants with ADHD who were near the end of rehabilitation were more severely impaired in their capacity to reintegrate into their previous occupation, but not for the general employment market.

CONCLUSION: Adult ADHD should be more closely investigated, especially in rehabilitation programs. Affected clients not only had more severe impairments, but more often had a profession that did not fit their capability

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Res Dev Disabil. 2019;94.

RELATIONS BETWEEN CAREGIVER-REPORT OF SLEEP AND EXECUTIVE FUNCTION PROBLEMS IN CHILDREN WITH AUTISM SPECTRUM DISORDER AND ATTENTION-DEFICIT/HYPERACTIVITY DISORDER.

Cremone-Caira A, Buirkle J, Gilbert R, et al.

Background: Many children with autism spectrum disorder (ASD) experience comorbid symptoms of attention-deficit/hyperactivity disorder (ADHD). Additionally, children with ASD and ADHD often have sleep disturbances and deficits in executive functioning (EF). In typical development, sleep disturbances are causally linked to EF deficits and exacerbate ADHD-like symptoms.

Aim: The aim of this study was to determine whether caregiver-report sleep and EF difficulties predict ADHD symptoms in children with ASD.

Methods: Caregiver-report of child sleep, EF, and ADHD symptom severity was collected for 101 children with ASD, 7-11 years of age. Hierarchical linear regressions tested the independent and interactive effects of sleep and EF in predicting ADHD symptoms.

Results: Children with ASD were more likely to have symptoms of ADHD if they experienced both sleep and EF difficulties. Children with difficulties in working memory were particularly at risk for clinically significant symptoms of ADHD. Notably, however, sleep did not mediate or moderate the relation between working memory and ADHD symptoms in this sample, suggesting that these variables act through independent mechanisms to increase vulnerability for comorbidity.

Conclusions: These results have clinical significance as sleep and EF deficits may identify an ASD subgroup that is at increased risk for a comorbid ADHD diagnosis

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Scand J Med Sci Sports. 2019 Aug;29:1243-53.

THE EFFECT OF EXERGAMING ON EXECUTIVE FUNCTIONS IN CHILDREN WITH ADHD: A RANDOMIZED CLINICAL TRIAL.

Benzing V, Schmidt M.

BACKGROUND: Children with ADHD frequently suffer from deficits in cognitive (ie, executive functions) and motor abilities. Although medication usually has a positive effect, a lack of commitment and possible side effects result in a need for adjunct or alternative treatments. Thus, the aim of the current study was to investigate the effects of cognitively and physically demanding exergaming on executive functions, ADHD symptoms, and motor abilities.

METHODS: In a parallel group randomized trial, 51 children between 8-12 years (M = 10.63; SD = 1.32) diagnosed with ADHD were assigned either to an 8-week exergame intervention group (three training sessions per week for 30 minutes) or a waiting-list control group. The core executive functions (inhibition, switching, updating), parent ratings of symptoms, and motor abilities were assessed/gathered before and after the intervention.

RESULTS: Analyses of covariance (using pre-test values as covariates) revealed that children in the exergame intervention group improved in specific executive functions (reaction times in inhibition and switching), general psychopathology as well as motor abilities compared to control group.

CONCLUSIONS: Findings indicate that exergaming might benefit two domains in which frequent deficits can be observed in children with ADHD, executive functions and motor abilities. Given that these beneficial effects in turn might positively affect psychopathology, exergaming could serve as an individualized home-based intervention in the future. However, in order to maximize benefits and make exergaming a valuable adjunct to treatment for children with ADHD, customized exergames are needed

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Sci Rep. 2018 Mar;8:4113.

PROBE-CAUGHT SPONTANEOUS AND DELIBERATE MIND WANDERING IN RELATION TO SELF-REPORTED INATTENTIVE, HYPERACTIVE AND IMPULSIVE TRAITS IN ADULTS.

Arabaci G, Parris BA.

Research has revealed a positive relationship between types of mind wandering and ADHD at clinical and subclinical levels. However, this work did not consider the relationship between mind wandering and the core symptoms of ADHD: inattention, hyperactivity and impulsivity. Given that the DMS-V attributes mind wandering to inattention only, and that only inattention is thought to result from impairment to the executive function linked to mind wandering, the present research sought to examine this relationship in 80 undiagnosed adults. Using both standard and easy versions of the Sustained Attention to Response Task (SART) we measured both spontaneous and deliberate mind wandering. We found that spontaneous mind wandering was related to self-reported inattentive traits when the task was cognitively more challenging (standard SART). However, hyperactive and impulsive traits were related to spontaneous mind wandering independent of task difficulty. The results suggest inattentive traits are not uniquely related to mind wandering; indeed, adults with hyperactive/impulsive traits were more likely to experience mind wandering, suggesting that mind wandering might not be useful diagnostic criteria for inattention

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Sci Rep. 2018 Feb;8:2670.

CHILDHOOD EPILEPSY AND ADHD COMORBIDITY IN AN INDIAN TERTIARY MEDICAL CENTER OUTPATIENT POPULATION.

Choudhary A, Gulati S, Sagar R, et al.

This study aimed to assess the prevalence of Attention Deficit Hyperactivity Disorder (ADHD) and its characteristics and risk factors in children with epilepsy at a tertiary medical center in New Delhi. Children with active epilepsy, aged 6 to 12 years, were assessed for ADHD using DSM-IV-TR criteria. Epilepsy and psychiatric characteristics, sociodemographic indicators, and use of antiepileptic drugs were analyzed for differences between the ADHD and non-ADHD groups. Among the 73 children with epilepsy, 23% (n = 17) had comorbid ADHD, of whom 59% (n = 10) had predominantly inattentive type, 35% (n = 6) combined type, and 6% (n = 1) predominantly hyperactive-impulsive type. Lower IQ scores, epileptiform EEG activity, not

attending school, and male sex were significantly associated with comorbid ADHD in children with epilepsy. Groups were similar in terms of age, socioeconomic indicators, family history of psychiatric disorders, seizure frequency in the last six months, seizure etiology, and seizure type. Epilepsy is a common pediatric neurological condition with frequent psychiatric comorbidities, including ADHD. Specialists should collaborate to optimize treatment for children with epilepsy and ADHD, especially for families in developing countries where the burden of disease can be great

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Sci Rep. 2018 Feb;8:3465.

GENETIC CONTRIBUTION TO 'THEORY OF MIND' IN ADOLESCENCE.

Warrier V, Baron-Cohen S.

Difficulties in 'theory of mind' (the ability to attribute mental states to oneself or others, and to make predictions about another's behaviour based on these attributions) have been observed in several psychiatric conditions. We investigate the genetic architecture of theory of mind in 4,577 13-year-olds who completed the Emotional Triangles Task (Triangles Task), a first-order test of theory of mind. We observe a small but significant female-advantage on the Triangles Task (Cohen's d = 0.19, P < 0.01), in keeping with previous work using other tests of theory of mind. Genome-wide association analyses did not identify any significant loci, and SNP heritability was non-significant. Polygenic scores for six psychiatric conditions (ADHD, anorexia, autism, bipolar disorder, depression, and schizophrenia), and empathy were not associated with scores on the Triangles Task. However, polygenic scores of cognitive aptitude, and cognitive empathy, a term synonymous with theory of mind and measured using the "Reading the Mind in the Eyes" Test, were significantly associated with scores on the Triangles Task at multiple P-value thresholds, suggesting shared genetics between different measures of theory of mind and cognition

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Stud Health Technol Inform. 2019 Sep;267:3-8.

DIFFERENTIAL ITEM FUNCTIONING FOR BOYS AND GIRLS IN A SCREENING INSTRUMENT FOR ATTENTION DEFICIT HYPERACTIVITY DISORDER.

Appelbaum S, Lefering R, Wolff C, et al.

Differential item functioning (DIF) indicates differential response probabilities of items for different subgroups. While there is a vast amount of research and literature on DIF in the field of educational screening and career assessment, DIF analysis has hardly been applied in the field of clinical assessment. This paper aims at analyzing the presence of gender related DIF in a cross-sectional survey of children assessed by a structured questionnaire containing items on attention deficit and hyperactivity. A total of 1449 children (mean age: 1.94 +/- 0.14 years; 51.2% male) were included. Almost no significant variations in parameters were found between boys and girls. Results based on a Partial Credit Model indicate an absence of DIF in eight out of nine items. Consistent with other studies in attention deficit hyperactivity disorder (ADHD) our results imply that the same level of rating for a symptom has the same meaning for boys and girls

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Stud Health Technol Inform. 2019 Aug;266:156-61.

DO DIGITAL HEALTH INTERVENTIONS IMPROVE MENTAL HEALTH LITERACY OR HELP-SEEKING AMONG PARENTS OF CHILDREN AGED 2-12 YEARS? A SCOPING REVIEW.

Peyton D, Hiscock H, Sciberras E.

BACKGROUND: Digital Health Interventions (DHIs) can improve mental health literacy (MHL) and help-seeking behaviour in teens and adults. However, it is unclear whether DHIs improve parental MHL, help-seeking behaviour or access to mental health services for their children.

OBJECTIVE: To perform a scoping review of DHIs aiming to improve MHL, help-seeking behaviour or access to mental health services among parents of 2-12-year-olds with behavioural and emotional problems (BEP).

METHOD: A search of Ovid MEDLINE found four original articles meeting inclusion criteria.

RESULTS: One of the four articles was a randomised controlled trial, which showed a significant improvement in some measures of MHL, but no change in help-seeking attitudes. The other three studies evaluated interventions, in uncontrolled pre-test and post-test evaluations, on attention-deficit/hyperactivity disorder knowledge. Two of these studies showed a significant change in ADHD knowledge. There was no consistency in MHL measures between studies.
CONCLUSIONS: There is preliminary evidence that DHIs may improve MHL in parents of children with BEP. How this translates to help seeking, access to mental health services or improved outcomes is unknown

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World Allergy Organization Journal. 2019;18:2.

EVALUATION FERQENCY OF ADHD IN CHILDHOOD ASTHMA.

Arani MH.

Introduction: Attention Deficit-Hyperactivity Disorder is one of the most common problems of children and adolescents and is a very common reason for visiting a pediatric psychologist or consultant. This disorder which has a profound effect on the lives of thousands of children and their families manifests in early childhood with symptoms of hyper activity, inattention and impulsivity. In studies conducted in western countries it has been pointed out that there is an association between ADHD symptoms and asthma in asthmatic children, and also the response to asthma treatment in children with ADHD is poor. This study is performed with the aim to evaluate the prevalence of ADHD in children referring to the clinic of Kashan Beheshti hospital.
Material and Method In this case-control study 206 children referred to the pediatric clinic of Kashan Beheshti hospital in the second half of 1388 were evaluated. Spirometery or peak flow metery was used for the diagnosis of ADHD. Using the SPSS software version 19, chi-square test and Fisher's exact test. Result It was found that the prevalence of ADHD in children with asthma is significant higher than control group and increases the risk about five fold more. It was also found that having ADHD does not have a significant correlation with the severity of asthma.
Conclusion: It was found that asthma is one of the risk factors for developing ADHD, but ADHD is not related to the severity of asthma morbidity

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World Journal of Clinical Cases. 2019;7:2420-26.

ATTENTION DEFICIT HYPERACTIVITY DISORDER AND COMORBIDITY: A REVIEW OF LITERATURE.

Gnanavel S, Sharma P, Kaushal P, et al.

Attention deficit hyperactivity disorder (ADHD) is a common neurodevelopmental disorder with onset in early childhood. It is a clinically heterogenous condition with comorbidity posing a distinct challenge to diagnosing and managing these children and adolescents. This review aims to provide an overview of comorbidity with ADHD including other neurodevelopmental disorders, learning disorders, externalising and internalising disorders. Challenges in screening for, diagnosing and managing comorbidity with ADHD are summarised. Also, methodological challenges and future directions in research in this interesting field are highlighted

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Article

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Polyunsaturated Fatty Acids Are Associated With Behavior But Not With Cognition in Children With and Without ADHD: An Italian study

Alessandro Crippa[1], Carlo Agostoni[2], Maddalena Mauri[1], Massimo Molteni[1], and Maria Nobile[1,3]

Abstract

Objective: This study aimed to investigate the relationship between polyunsaturated fatty acids (PUFAs) status, cognitive, and behavioral traits of ADHD in school-aged children. **Method:** Seventy-three children with and without ADHD were assessed with cognitive tasks and behavioral rating scales including quality of life and global functioning at baseline of an intervention trial (clinicaltrials.gov NCT01796262). Correlation analyses were performed between the cognitive tasks/behavioral ratings and blood PUFA levels. **Results:** Children with ADHD had lower levels of DHA, omega-3 index, and total PUFA. PUFAs were positively associated with behavior but not consistently related to cognitive domains. **Conclusion:** The present study confirms that children with ADHD display abnormal fatty acid profiles within an Italian setting. Furthermore, PUFAs were associated with behavior but not with cognition. Accordingly, for the first time, lower blood levels of PUFA were associated not only with symptoms of ADHD but also with a poorer quality of life. *(J. of Att. Dis. 2018; 22(10) 971-983)*

Keywords

ADHD, fatty acids, cognition, behavior, quality of life

Introduction

ADHD is a heterogeneous neurodevelopmental disorder that is characterized by a lack of attention, excessive motor activity, and high levels of impulsivity. These difficulties have a significant impact on familial, relational, and school functioning in more than one setting (*Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition* [*DSM*-5]; American Psychiatric Association [APA], 2013). ADHD is a complex condition that affects 7.2% of children worldwide (Thomas, Sanders, Doust, Beller, & Glasziou, 2015; although the Italian average prevalence is about 1% according to the National Institute of Health, 2014), and its etiology is generally considered multifactorial. Although high heritability estimates suggest a critical role of genetic factors (Faraone & Mick, 2010), environmental variables are also important to understand the pathogenesis of the disorder. In the last decades, a growing body of research has drawn attention to the role of diet in symptoms of children with ADHD as playing a potential role in the pathophysiology of the disorder and, therefore, as a possible coadjutant approach to pharmacological treatment. Several links between ADHD and nutritional factors have been reported (Stevenson et al., 2014). Among these, the most intensively investigated issue is the role of polyunsaturated fatty acids (PUFAs).

Within long-chain PUFAs, docosahexaenoic acid (DHA; omega-3), its precursor eicosapentaenoic acid (EPA; omega-3), and arachidonic acid (AA; omega-6) are relevant components of all cell membranes, phospholipids, and precursors of eicosanoids, the key mediators of biologic processes, thus influencing the quality of growth and development (Janssen & Kiliaan, 2014). DHA, in particular, has a critical role in maintaining membrane integrity and fluidity, influencing inter-cell signal processes and the release of neurotransmitters (Schuchardt &

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Hahn, 2011). With specific regard to the central nervous system, DHA and AA are the most abundant PUFAs in the brain. Although both DHA and AA appear to be essential to neuronal development and function (Uauy, Hoffman, Peirano, Birch, & Birch, 2001), they have divergent functions in respect to the inflammatory processes. More specifically, AA produces eicosanoids with inflammatory and predominantly vasoconstrictor properties, whereas EPA—the DHA precursor—has more anti-inflammatory properties (see, for example, van Elst et al., 2014). Omega-6 fatty acids are the predominant PUFA in all diets, especially in Western countries. The excessive intake of omega-6 fatty acids produces an imbalance of omega-6 to omega-3 PUFAs, which potentially leads to an overproduction of the proinflammatory prostaglandins of the omega-6 series (Simopoulos, 2011). When diets are supplemented with omega-3, the latter partially replace the omega-6 fatty acids in the membranes of almost all cells.

Colquhoun and Bunday (1981) were the first to propose an association between blood PUFA levels and hyperactivity in children on the basis of a systematic observation of symptoms of essential fatty acid deficiency in a large pediatric population. Since then, many clinical studies have investigated the efficacy of PUFA supplementation on ADHD symptoms and five meta-analyses have been carried out in the last few years. Three of them (Bloch & Qawasmi, 2011; Hawkey & Nigg, 2014; Sonuga-Barke et al., 2013) have suggested a small but significant effect of omega-3 supplementation, whereas Gillies, Sinn, Lad, Leach, and Ross (2012) did not report any relevant effect. Interestingly, another meta-analysis (Cooper, Tye, Kuntsi, Vassos, & Asherson, 2015) has indicated a small evidence of benefit limited to patients with low levels of omega-3 at baseline. Despite the amount of research on the effect of PUFA supplementation, only a few observational studies have considered the baseline PUFA status in children with ADHD. Although the results are too heterogeneous to allow firm conclusions, some differences have been replicated in independent studies and seem to be constant in research. The more reliable finding indicates lower blood levels of omega-3 in ADHD children versus healthy, normally developing, controls, as also confirmed by a recent meta-analysis (Hawkey & Nigg, 2014). Moreover, DHA levels are responsible for a major percentage of the difference in omega-3 profiles. Finally, case-control studies have indicated an increase in the omega-6/omega-3 ratio (Antalis et al., 2006; Stevens et al., 1995), or, inversely, a lower omega-3/omega-6 ratio in children with ADHD (Colter, Cutler, & Meckling, 2008). Furthermore, few observational studies have reported an inverse association between baseline omega-3 PUFA status, in particular DHA, and the rates of ADHD symptoms (Colter et al., 2008; Stevens, Zentall, Abate, Kuczek, & Burges, 1996; Stevens et al., 1995) in a general population that includes children with ADHD and typically developing controls. A positive correlation between omega-6 PUFA, omega-6/omega-3 ratio, and behavioral problems has been described in ADHD (Colter et al., 2008), and, according to a more recent study (Gow et al., 2013), a significant association between anti-social traits in adolescent boys with ADHD and lower omega-3 levels has also been described.

To date, studies that investigate differences in PUFA levels by comparing school-aged children with ADHD with typically developing controls are lacking within an Italian setting. As mentioned, constant observations in different contexts may reinforce the biological plausibility of the hypothesis of the role of PUFA status. Furthermore, to the best of our knowledge, no studies have examined the association between PUFA status and both cognition and behavior in children with and without ADHD, respectively. The aim of the present study is to check the PUFA status in ADHD patients and controls in Italian school-aged children by examining different cognitive domains (focused and sustained attention, inhibition, flexibility, reading) and behavioral symptoms in both study groups.

Method

The present work is a cross-sectional, observational study that reports baseline data from an ongoing placebo-controlled double-blind intervention trial investigating the efficacy of supplementation with DHA in children aged 7 to 14 with ADHD (the 'The Effects of DHA on Attention Deficit and Hyperactivity Disorder (DADA)' Study). The intervention trial was registered at clinicaltrials.gov as NCT01796262. A comparison group of typically developing children was included in this cross-sectional study and matched by gender, age, and full-scale IQ (the comparison group was not subsequently enrolled in the intervention trial). The study was explained to both children and their parent(s) or caregivers, and all of the participants' legal guardians gave their informed written consent prior to the children's participation. The research was approved by the ethics committee of our institute, in accordance with the Declaration of Helsinki. Data collection for the observational study began in June 2012 and ended in October 2014.

Participants

Children aged 7 to 14 with ADHD were recruited from the Child Psychopathology Unit at our institute over a 22-month period. The study coordinator contacted approximately 120 families by phone to invite children and parents to participate in the study protocol. Of these, 51 participants with ADHD and their parents agreed to participate and gave informed consent. The main reason for declining to participate was the child's refusal to have his or her blood sampled. All participants in the ADHD group had been previously

diagnosed according to *Diagnostic and Statistical Manual of Mental Disorders* criteria (4th ed., text rev.; *DSM-IV-TR*; APA, 2000) by a child neuropsychiatrist with expertise in ADHD. The diagnoses were then confirmed independently by a child psychologist through direct observation and the administration of the semi-structured interview Development and Well-Being Assessment (DAWBA; Goodman, Ford, Richards, Gatward, & Meltzer, 2000). According to clinical diagnoses and interviews, 15.7% of children with ADHD had the inattentive subtype, 33.3% had the hyperactive–impulsive subtype, and 51% had the combined subtype.

Twenty-two healthy developing children were recruited as a control group by local pediatricians and from schools in the same areas of ADHD children, gender, age, and IQ matched to the clinical sample. Diagnoses according to *DSM-IV TR* were excluded in these children through the DAWBA parent diagnostic interview. Two subtests of the Wechsler Adult Intelligence Scale–III (WISC-III; vocabulary, block design; Wechsler, 2006) were administered to the children in the control group. The estimated Full Scale Intelligence Quotient (FSIQ) was used to match the two groups. The WISC subtests have a correlation of .93 to .95 with the FSIQ (Groth-Marnat, 1997). All participants were required to have FSIQ or estimated FSIQ scores of higher than 80 on the WISC-III or Wechsler Adult Intelligence Scale–IV (WISC-IV) scales (Wechsler, 2006, 2012). Exclusion criteria were the presence of suspected signs of social/communicative disorders, and major medical or neurological disorders. All participants were Caucasian, had normal or corrected-to-normal vision, and were drug-naïve. Moreover, no child had consumed omega-3/omega-6 supplements during the 3 months prior to the recruitment.

Procedure

All participants were assessed at our institute's Child Psychopathology Unit after a minimum 1-hr fast. Measurement of clinical parameters included height without shoes, weight in light clothing, and blood pressure (systolic and diastolic). Blood samples were obtained by collecting drops of blood from a fingertip.

Materials

The participants filled out the Pubertal Developmental Scale (Petersen, Crockett, Richards, & Boxer, 1988). Weekly frequency of fish consumption was then investigated. Last, data on parental employment were used as a measure of socioeconomic status (SES) and coded according to the Hollingshead 9-point scale for parental occupation (Hollingshead, 1975).

Cognitive profile. An abbreviated battery of cognitive tests from the Amsterdam Neuropsychological Tasks (ANT; de Sonneville, 2000) program was used to assess executive function domain. All participants completed four computerized tasks that were always administered in the same order; that is, Baseline speed, Focused attention 4 letters, Shifting attentional set–visual, and Sustained Attention. Baseline speed measures simple response times to stimulus presence; the dependent variables of this task were (a) median reaction time (RT) and (b) standard deviation (*SD*) of RTs. In the Focused attention test, participants had to respond (pressing the "yes" key) to one target letter among four letters presented on the screen at the same time, only when it was displayed in the relevant diagonal positions. Children were instructed to reject any other stimulus by using a different response key. The dependent variables were as follows: (a) RT for correct responses, (b) *SD* of RTs for correct responses, (c) misses, and (d) false alarms (Günther, Herpertz-Dahlmann, & Konrad, 2010). The Visual set-shifting task is composed of three conditions and investigates three basic cognitive variables: vigilance, inhibition, and cognitive flexibility. The stimulus is a bar with a colored square, which may skip quickly from left to right or vice versa. Depending on the color of the square, participants had to press a key that corresponded with the side where the square jumped (Condition 1) or press opposite keys (Condition 2). Condition 3 requires the children to adjust their response sets according to the color of the square, which changed throughout the task. The dependent measures of this task were (a) mean response time inhibition (difference in RTs between Conditions 2 and 1), (b) mean response time flexibility (difference in RTs between Conditions 3 and 1), (c) number of errors on inhibition, and (d) number of errors on flexibility (Daams et al., 2012). Finally, the Sustained attention assessed the fluctuation of attention over time. Children were shown 50 series of 12 different dot patterns. In each series, participants had to press a key whenever the target dot pattern appeared (4-dot pattern, 33% of the trials) or a different response key when a non-target (3- or 5-dot) pattern was presented. As dependent measure, (a) the sum of the 12 latencies per series (TEMPO × series), (b) *SD* of this sum across series, (c) misses, and (d) false alarms (Günther et al., 2010) were used. Moreover, (e) the coefficient of variation (i.e., *SD*/*M* RT; Klein, Wendling, Huettner, Ruder, & Peper, 2006) was also registered. Reading skills were also assessed using word and non-word reading subtests from the Italian standardized "Battery for the Assessment of Developmental Reading and Spelling Disorders" (Sartori, Job, & Tressoldi, 1995); both reading speed (syllables/seconds) and reading accuracy (number of errors) were registered.

Behavior profile. The parents completed Conners' Parent Rating Scale–R (CPRS-R, 1997) and ADHD rating scale IV Parent Version–Investigator completed (ADHD-RS; DuPaul, Power, Anastopoulos, & Reid, 1998) to assess ADHD behaviors. For CPRS-R, the dependent measures

included Hyperactivity as well Inattention scales, and were ADHD index, Conners' Global Index restless–impulsive, Conners' Global Index emotional lability, Conners' Global Index total, *DSM-IV* inattentive, *DSM-IV* hyperactive–impulsive, and *DSM-IV* total. The Strengths and Difficulties Questionnaire (SDQ; Goodman, 1997) was then filled out by the parents to measure the emotional and behavioral difficulties frequently associated with the disorder.

Functioning profile. To investigate the impact of ADHD on the quality of life, the Child Health Questionnaire–Parent Form 28 item (CHQ-PF28; Landgraf, Abetz, & Ware, 1996) was completed by the parents. CHQ is a well-validated measure of quality of life, comprising an overall summary score for psychosocial functioning, as well as subscales that assess self-esteem, impact of the disorder on the parents, and participation in family activities. The children's global functioning was evaluated by a clinician using the Clinical Global Impression–severity (CGI; Busner & Targum, 2007) and the Children' Global Assessment Scale (C-GAS; Shaffer et al., 1983).

Blood Collection and Fatty Acid Profiles Analysis

Whole blood samples were obtained from all participants to evaluate the fatty acid (FA) profile. The fatty acid analysis in whole blood has several advantages compared with the evaluation in other blood components. Whole blood is more easily obtainable than other components such as plasma and red blood cells; this represents a major benefit in observational and in supplementation studies where a large number of participants is needed. Moreover, although the examination of PUFA in red blood cells may provide a more reliable measurement of long-term accumulation of long-chain fatty acids, the whole blood fatty acid composition offers a more balanced picture about the status of circulating PUFA (both long- and short-chain fatty acids) in relation to fat dietary intakes (Agostoni et al., 2011; Risè et al., 2007). All the blood samples were collected on a strip of paper for chromatography after a minimum 1-hr fast, through a puncture of the fingertip that was performed with an automatic lancing device equipped with lancets. All samples were preserved at 4°C until analyzed. The strips of paper were directly transmethylated using a well-validated protocol (Marangoni, Colombo, & Galli, 2004). Fatty acid methyl esters were analyzed after injection into a gas chromatograph (GC-2014 Gas Chromatograph, Shimadzu, Japan) equipped with an SGE capillary column (30 m × 0.25mm, ID-BPX70 0.25 µm, SGE, Melbourne, Australia), Programmable Temperature Vaporizer (PTV) injector, Flame Ionization Detector (FID), and a dedicated data system. The analysis temperature started from 110, increased to 250°C at 5°C/min, and after 5 min, decreased to 220°C at the same rate. Peaks were identified by separated analysis of pure standards. Fatty acids from 14 to 24 carbons were detected. Fatty acid values were then expressed as a percentage of total fatty acids. We report single fatty acid data only for main omega-3 and omega-6, as these PUFAs are the focus of the present work. The AA/EPA and AA/DHA ratios are calculated as reliable indexes of the functional effects of long-chain PUFAs (Simopoulos, 2002). Last, the sum of EPA and DHA (the "omega-3 index"; Montgomery et al., 2013), and the sum of saturated (SFA), monounsaturated (MUFA), and polyunsaturated fatty acids (PUFA) are also reported. SFA is known to be positively associated with concentrations of inflammation markers in blood, whereas MUFA can lead to a decrease of inflammatory molecules (see, for example, van Dijk et al., 2009). In the present study, SFA included palmitic acid and stearic acid; MUFA, palmitoleic and oleic acid; and PUFA included linoleic acid, linolenic acid, eicosatrienoic acid, arachidonic acid, EPA, DHA, and docosapentaenoic acid.

Statistical Analysis

First, a visual and statistical assessment of data was carried out to check the assumptions of normality, linearity, independence of observations, and homogeneity of error variance. These analyses revealed an outlier in terms of arachidonic acid (AA): EPA ratio (3 *SD*s from the next highest score) in the ADHD group. Although the reliability of this datum was verified, the participant's data were excluded from all further analysis of the fatty acid profile. A chi-square analysis was then performed to examine group differences in gender distribution. Independent-samples *t* test was used to individually examine group differences in age and IQ. Next, comparisons between children with ADHD and typically developing controls were then conducted on clinical questionnaires, cognitive measures, and blood fatty acid levels using Mann–Whitney or independent-samples *t* test according to the distributional nature of the data. Differences across groups in fatty acid concentrations for fish consumption were assessed using the Kruskal–Wallis test. Last, bivariate Spearman's rho correlations were conducted to determine associations between fatty acid levels, cognition, and behavior. Because this study was exploratory, no correction was applied for family-wise error rate; however, 95% confidence intervals (CIs) for rho were calculated using bootstrapping methodology (based on 1,000 bootstrap resamples) to appropriately indicate the likely size of the population effect (Field, 2013).

Results

Demographic, Behavioral, and Cognitive Assessment

Data on the demographic, cognitive, and behavioral measures of the participants are summarized in Tables 1, 2, and 3.

Table 1. Demographics of the Participants.

	ADHD	Controls		*p*
N	51	22		
Females:males	4:47	1:22	0.262[a]	.609
Age	11.0 ± 1.6	11.4 ± 1.9	1.024[b]	.309
IQ	103.4 ± 13.4	109.6 ± 19.5	1.580[b]	.119
SES	53.8 ± 18.6	56.1 ± 18.3	0.490[b]	.626

Note. ADHD = children with ADHD; SES = socioeconomic status.
[a]Chi-square test.
[b]Student's *t* test.

The validity of gender, age, and full-scale IQ matching was confirmed (all $p > 0.05$); SES was also balanced between groups ($p > .05$). Fish consumption was different between groups, $\chi^2(3) = 11.944$, $p = .008$, with children who had ADHD consuming larger amounts of fish weekly, as reported by parents (not consuming fish at all: ADHD = 7.8%, controls = 4.5%; less than once a week: ADHD = 2%, controls = 27.3%; once a week: ADHD = 62.7%, controls = 54.5%; more than once a week: ADHD = 27.5%, controls = 13.7%). Several significant group differences in ADHD symptoms were found, based on both clinical scores and questionnaires (CGI, C-GAS, CPRS, ADHD-RS; see Table 2), consistent with the diagnosis-based expectations. Moreover, children in the clinical group showed significantly more difficulties that often co-occurring with ADHD, such as emotional or conduct problems or difficulties with peers (SDQ). There were also significant group differences in terms of quality of life, with children with ADHD having globally lower well-being indexes (see Table 2). As for reading abilities, children with ADHD performed significantly worse than healthy controls in word and non-word reading, in both speed and accuracy. For cognitive measures, the ADHD group showed more variability in simple response time to stimulus presence (Baseline speed) and more false alarms for irrelevant target (Focused attention task) than did the group with typical development. Children with ADHD made also more inhibition and flexibility errors (Set-shifting). Finally, the ADHD group showed difficulties in sustaining attention over time, as indicated by more variability in reaction times and misses of target (Sustained attention; see Table 3).

Fatty Acid Analysis

Data on the fatty acid profile of the participants are shown in Table 4. Two children (both in the ADHD group) among the 73 participants recruited could not be analyzed due to insufficiency of the absorbed blood sample.

When compared with typically developing participants, children with ADHD had significantly lower levels of DHA, omega-3 index, and total polyunsaturated fatty acids. No other difference was found. There were no significant differences across groups in fatty acid concentrations for fish consumption, as reported by parents ($p > .05$).

Correlations Between Cognitive Measures and Fatty Acid Levels

The Spearman coefficients revealed a weak positive correlation between DHA and number of misses in the Focused attention task ($\rho = .247$, $p < .05$, 95% CI = [0.02, 0.48]), and a modest correlation between AA and mean response time of inhibition in Set-shifting ($\rho = .301$, $p < .05$, 95% CI = [0.06, 0.51]). No other significant correlations were found between cognition and fatty acid recorded.

Correlations Between Behavioral Data and Fatty Acid Levels

Significant correlations between behavioral scores and fatty acid levels of all participants ($n = 70$) are depicted in Table 5. No significant correlations were found between any CPRS scale and fatty acid levels (data of CPRS are not shown in the table).

ADHD symptoms as rated by parents (ADHD-RS) and clinical impression of severity (CGI) were negatively correlated with DHA, omega-3 index, and PUFA, and were positively associated with AA/DHA ratio. Significant negative associations were found between AA, EPA, DHA, PUFA, and many SDQ scores, while SFA correlated positively with SDQ impact. C-GAS correlated positively with omega-3 index and PUFA, and negatively with MUFA. Several positive correlations were found also between the parent's scores concerning the participants' quality of life (CHQ) and AA, EPA, DHA, omega-3 index, and PUFA (see Table 5, Figures 1 and 2). In turn, AA/DHA ratio and MUFA were negatively correlated with measures of the children's functioning at CHQ (see Table 5).

Discussion

The purpose of the present study was twofold. First, we aimed to examine, in an Italian school-aged sample, the blood PUFA profile of children with ADHD compared with their typically developing peers. To date, this is the first Italian study to compare the blood PUFA profile of children with and without ADHD. Second, we intended to describe the possible relationship between the PUFA percentages and both cognitive, behavioral traits and functioning that characterize ADHD, and represent the quality of life. To achieve these goals, we recruited two groups—children with a clinical diagnosis of ADHD between the ages of 7 and 14, and gender, age, and IQ-matched healthy controls.

With regard to the first goal of our study, we found significantly lower levels of DHA, omega-3 index (i.e., the sum of DHA and EPA; Montgomery et al., 2013), and total

Table 2. Group Means and Standard Deviations of Cognitive Measures of Participants.

	ADHD (*n* = 51)		Controls (*n* = 22)		Mann–Whitney Test	
	M	*SD*	*M*	*SD*	*U*	*p*
Reading abilities						
Word reading speed (syll/s)	2.85	1.08	3.93	1.09	276.5	**.001**
Word reading accuracy (errors)	4.98	4.46	1.68	1.55	287.5	**.001**
Non-word reading speed (syll/s)	1.70	0.64	2.30	0.79	302.0	**.002**
Non-word reading accuracy (errors)	6.63	5.46	3.82	3.20	373.5	**.024**
ANT—Baseline speed						
RT (ms)	346.46	71.38	314.59	46.36	431.5	.147
SD of RT	132.9	81.74	88.59	23.44	355.5	**.017**
ANT—Focused attention 4 letters						
RT correct responses (ms)	1,008.39	335.94	959.36	347.96	473.5	.293
SD of correct responses RT	436.44	241.38	343.38	186.72	441.0	.149
Misses	2.98	2.69	2.09	2.09	442.5	.148
False alarms relevant non-target	0.96	1.17	0.50	0.74	445.0	.128
False alarms irrelevant target	1.75	2.75	0.82	1.26	378.0	**.022**
ANT—Visual set-shifting						
RT inhibition (ms)	350.61	258.42	405.73	279.98	491	.400
RT flexibility (ms)	639.14	294.30	789.64	365.40	441	.149
Number of errors inhibition	8.12	6.70	3.45	4.23	289	**.001**
Number of errors flexibility	18.61	12.42	14.45	14.40	398.5	**.050**
ANT—Sustained attention date						
Tempo × Series	14.88	3.66	14.09	3.47	496.5	.438
SD	3.60	1.51	2.46	1.18	302.5	**.002**
Misses	35.98	25.22	19.27	18.35	282.5	**.001**
False alarms	23.59	17.15	18.86	18.46	418.5	.086
Coefficient of variation	0.24	0.07	0.17	0.05	244.0	**<.001**

Note. ADHD = children with ADHD; RT = reaction time; *SD* = standard deviation; ANT = Amsterdam Neuropsychological Task; contrasts in bold are significant at alpha = .05.

PUFA in children with ADHD compared with children with typical development. The whole blood PUFA analysis we report here therefore extends the previous findings of abnormal fatty acid percentages in ADHD children (Hawkey & Nigg, 2014) also to an Italian school-aged sample. Our findings do not yet support other results from case-control studies, indicating an increased omega-6/omega-3 ratio (Antalis et al., 2006; Stevens et al., 1995), or a lower omega-3/omega-6 ratio (Colter et al., 2008) in ADHD. However, we observed a numerical, although not significant, difference in AA/EPA ratio in children with ADHD. Because the standard deviation for this estimate was quite large, a larger sample size could have been able to detect this further significant difference. Indeed, a limitation of the present study is related to the small sample sizes of participant groups, in particular with respect to the healthy control group. A group difference emerged in weekly fish intake, with ADHD children consuming more fish than typically developing peers, as reported by parents. Nevertheless, we did not find any significant relationship between the amount of fish consumed and levels of PUFA circulating in blood, as opposed to previous findings (e.g., Montgomery et al., 2013). Unfortunately, the quantity and quality of fish consumed were not collected with daily dietary recordings and other possible dietary sources of n-3 fatty acids (e.g., nuts or vegetable oils, rich in alpha-linolenic acid) were not investigated. Future extensions of this work should include more objective measures of fish consumption and dietary nutrients on the whole to verify the well-documented relation between fish intakes and blood PUFA percentages. Besides these considerations, the role of the children's genotype should be also taken into account as a significant factor in determining the PUFA status. Caspi and colleagues (2007), for instance, indicated an association between the child's genotype for single nucleotide polymorphisms (SNP) rs174575 on FA desaturase (FADs) and his or her AA and DHA levels. In the last years, studies investigating the efficacy of FAs supplementation started to weigh these gene–diet interaction effects due to FADs polymorphism to explain the inter-individual variability in blood FA levels after supplementation (see, for example, Bouchard-Mercier et al., 2014).

Table 3. Group Means and Standard Deviations of Behavioral Measures of Participants.

	ADHD (n = 51)		Controls (n = 22)		Mann–Whitney Test	
	M	*SD*	*M*	*SD*	*U*	*p*
Strengths and Difficulties Questionnaire						
Emotional problem scale	2.90	2.20	1.27	1.12	285.5	**.001**
Conduct problem scale	3.65	1.67	0.91	1.15	91.5	**<.001**
Hyperactivity scale	7.88	2.53	1.27	1.49	7.5	**<.001**
Peer problems scale	2.75	3.45	1.05	1.46	337.0	**.006**
Prosocial scale	7.45	2.27	7.82	1.50	540.0	.802
Impact	2.94	2.55	0.09	0.29	163.0	**<.001**
Total difficulties scores	17.18	6.57	4.5	3.67	39.0	**<.001**
ADHD rating scale						
Hyperactivity–Impulsivity scale	14.69	5.51	1.91	1.90	18.5	**<.001**
Inattention scale	15.53	5.86	2.68	3.00	24.0	**<.001**
Total	30.22	10.00	4.59	4.46	10.5	**<.001**
Conners' parents rating scales						
ADHD index	73.33	10.29	43.32	6.90	11.5	**<.001**
CGI: restless–impulsive	69.33	10.63	42.45	7.04	28.5	**<.001**
CGI: emotional lability	59.16	14.13	43.68	4.74	158.0	**<.001**
CGI: total	67.27	13.30	41.95	6.32	44.5	**<.001**
DSM-IV: inattentive	70.75	14.54	44.86	7.82	64.0	**<.001**
DSM-IV: hyperactive–impulsive	68.29	13.28	41.45	4.25	33.0	**<.001**
DSM-IV: total	72.06	12.51	42.50	6.27	34.5	**<.001**
Child Health Questionnaire						
Physical functioning	0.25	0.77	0.40	0.51	504.0	.288
Role—Physical	−0.93	1.84	0.29	0.52	355.0	**.004**
General health	0.83	0.78	1.20	0.52	396.5	**.046**
Bodily pain	−0.01	1.05	0.24	0.82	497.0	.416
Role—Emotional/behavioral	−0.88	1.84	0.49	0.00	319.0	**<.001**
Parental impact—Time	−0.06	1.16	0.76	0.18	314.0	**<.001**
Parental impact—Emotional	−0.59	0.92	0.47	0.83	199.0	**<.001**
Self-esteem	−0.64	0.92	0.04	0.59	290.0	**.001**
Mental health	−1.81	1.32	0.11	1.04	153.5	**<.001**
Behavior	−1.31	0.91	0.48	0.82	88.0	**<.001**
Physical summary	0.36	0.75	0.72	0.46	401.0	.054
Psychosocial summary	−1.30	1.00	0.35	0.54	74.0	**<.001**
Children' Global Assessment Scale	68.27	8.79	96.45	4.28	3.0	**<.001**
Clinical Global Impression–Severity	3.92	0.89	1.14	0.35	1.5	**<.001**

Note. ADHD = children with ADHD; CGI = Conners' Global Index; contrasts in bold are significant at alpha = .05.

With regard to the second aim of this study, we have concurrently investigated the relationship between PUFA and both cognition, behavior, and functioning in a sample of children with and without a medical diagnosis of ADHD. Regardless of diagnosis, we found in the present work a few puzzling findings when assessing PUFA percentages and performance on a cognitive test battery. Furthermore, we did not find any significant correlation between PUFA and reading. These results deviate from previous findings on children in mainstream primary schools (Montgomery et al., 2013), where an association between low omega-3 PUFA, and poor reading and working memory skills was described. However, our data are in line with other negative findings on healthy children from the general population (Kirby et al., 2010). More interestingly, the present findings are also in agreement with recent suggestions from supplementation studies that PUFA could be not related to cognition in either mixed samples of children with and without ADHD, or in children with ADHD and reading difficulties, or in healthy children (Cooper et al., 2015).

We found yet a greater number of weak, but significant, associations between PUFA status and both ADHD symptoms and other difficulties often associated with the disorder. Higher levels of PUFA, in particular EPA, DHA, and

Table 4. Whole Blood Fatty Acid Analysis Data.

	ADHD (*n* = 48)		Controls (*n* = 22)		
	M	*SD*	*M*	*SD*	*p*
% 18:2*n*-6 (LA)	22.29	2.38	22.54	2.45	.686[a]
% 20:4*n*-6 (AA)	9.34	2.03	10.10	0.92	.056[b]
% 20:5*n*-3 (EPA)	1.04	0.78	1.13	0.45	.094[b]
% 20:6*n*-3 (DHA)	1.71	0.46	1.93	0.53	**.044**[b]
Ω-3 INDEX (DHA + EPA)	2.85	1.25	3.06	0.63	**.031**[b]
AA/EPA	13.21	8.91	11.72	5.44	.909[b]
AA/DHA	5.69	1.39	5.60	1.72	.821[a]
SFA	33.92	3.93	34.05	1.88	.878[a]
MUFA	27.53	3.83	25.68	2.30	.051[b]
PUFA	37.64	4.09	39.96	3.19	**.022**[a]

Note. LA = linoleic acid; AA = arachidonic acid; EPA = eicosapentaenoic acid; DHA = docosahexaenoic acid; SFA = saturated fatty acids; MUFA = monounsaturated fatty acids; PUFA = polyunsaturated fatty acids; ADHD = children with ADHD; contrasts in bold are significant at alpha = .05.
[a]Student's *t* test.
[b]Mann–Whitney test.

their sum—the omega-3 index—were associated with lower parental rates of ADHD symptoms, lower clinical scores of severity, and a better global functioning. However, elevated AA/DHA ratio, SFA, and MUFA levels corresponded to more severe symptomatology. These findings confirm previous results from other observational studies (Colter et al., 2008; Stevens et al., 1996; Stevens et al., 1995), suggesting, in addition, a significant relationship exists between PUFA levels and clinical ratings of behavior. Furthermore, we described here a clear pattern of positive correlation between several PUFA levels (AA, EPA, DHA, omega-3 index, total PUFA) and children's quality of life as judged by parents on CHQ, whereas indices of omega-6/omega-3 ratio (i.e., AA/DHA) and MUFA were conversely associated with lower quality of life. Finally, five out of 10 PUFA levels we analyzed showed significant correlations with mental health score and behavior CHQ scale. Our overall results suggest, therefore, that lower PUFA may be associated not only with ADHD symptoms but also with lower functioning, and with a worse quality of life for children. An opposite trend was observed for measures of omega-6/omega-3 ratio, saturated and monounsaturated fatty acids. These concurrent investigations do not seem to have been assessed together previously.

As already mentioned for the fatty acid analysis, some limitations should also be considered for this second part of the study. The present report represents a cross-sectional, observational study; as a consequence, although the findings provide some evidence of an association between PUFA and ADHD behaviors, this correlational analysis's results should be interpreted with caution and cannot indicate any causal relationship. Although we do not consider appropriate to apply corrections to multiple comparisons because this study was exploratory and many of the clinical measures used are intercorrelated, the present results require replication on a larger scale to verify the generalizability of the novel findings we documented. Indeed, it is opportune to consider that the biologic plausibility of a hypothesis is accepted when trials with sufficient sample size, calculated on the basis of the variability of the study parameters in previous studies, include a sample size that is adequately powered on a statistical standpoint.

We feel that the present data also confirm, in an Italian school-aged setting, that children with ADHD display an abnormal essential fatty acid profile, suggesting that PUFA deficiency could be one of the multiple etiological factors of ADHD (Transler et al., 2010). Of the functions explored, cognition seems poorly associated with PUFA status in both ADHD and control children, as opposed to significant associations between PUFA and behavior. Different mechanisms could be responsible for changes in cognitive performance and changes in behavioral responses (Coghill et al., 2007). Finally, these results preliminarily indicate that lower blood levels of PUFA could be associated, in ADHD, not only with core symptoms but also with a poorer quality of life. Future observational and intervention studies, if undertaken to confirm the present findings, should include larger sample sizes that are adequately powered and that also consider the children's quality of life. Furthermore, future studies in which the samples are large enough to study possible differences in fatty acid composition related to ADHD subtypes could also be fruitful.

Table 5. Spearman Coefficients Values for Significant Correlations Between Fatty Acid Measures and Behavioral Measures of All Participants (n = 70).

	% 18:2*n*-6 (LA)	% 20:4*n*-6 (AA)	% 20:5*n*-3 (EPA)	% 20:6*n*-3 (DHA)	Ω-3 INDEX (DHA + EPA)	AA/EPA	AA/DHA	SFA	MUFA	PUFA
Strength and Difficulties Questionnaire										
Conduct problem scale		−0.293* [−0.491, −0.091]		−0.272* [−0.469, −0.064]	−0.252* [−0.472, −0.01]					−0.304* [−0.485, −0.096]
Hyperactivity scale				−0.267* [−0.483, −0.035]	−0.260* [−0.476, −0.027]					
Impact			−0.275* [−0.468, −0.059]					0.281* [0.06, 0.486]		
Total difficulties scores				−0.278* [−0.464, −0.058]	−0.242* [−0.45, −0.036]					
ADHD rating scale										
Inattention scale				−.0248* [−0.456, −0.027]			0.239* [0.003, 0.459]			
Total score				−0.242* [−0.469, −0.007]			0.247* [0.003, 0.476]			
Children' Global Assessment Scale					0.247* [−0.025, −0.467]				−0.248* [−0.432, −0.024]	0.297* [0.084, 0.486]
Clinical Global Impression–Severity				−0.258* [−0.473, −0.035]	−0.285* [−0.491, −0.059]					−0.295* [−0.506, −0.077]
Child Health Questionnaire										
Role—Emotional/behavioral		0.280* [0.028, 0.496]		0.274* [0.002, 0.506]					−0.273* [−0.471, −0.044]	−0.263* [0.029, 0.474]
Parental impact—Emotional				0.265* [0.029, 0.483]			−0.258* [−0.492, −0.02]			
Parental impact—Time									−0.286* [−0.509, −0.047]	
Mental health		0.353** [0.115, 0.557]	0.274* [0.028, 0.484]	0.353** [0.106, 0.582]	0.311** [0.083, 0.515]					0.300* [0.053, 0.513]
Behavior		0.291* [0.079, 0.475]	0.246* [0.002, 0.471]	0.349** [0.111, 0.582]	0.322** [0.075, 0.532]					0.322** [0.101, 0.494]
Psychosocial summary		0.327** [0.092, 0.525]		0.335** [0.085, 0.557]	0.287* [0.045, 0.509]					0.313* [0.07, 0.524]

Note. LA = linoleic acid; AA = arachidonic acid; EPA = eicosapentaenoic acid; DHA = docosahexaenoic acid; SFA = saturated fatty acids; MUFA = monounsaturated fatty acids; PUFA = polyunsaturated fatty acids. Lower and upper bounds of 95% confidence intervals for Spearman's rho coefficients are provided in square brackets.
*p < .05. **p < .01.

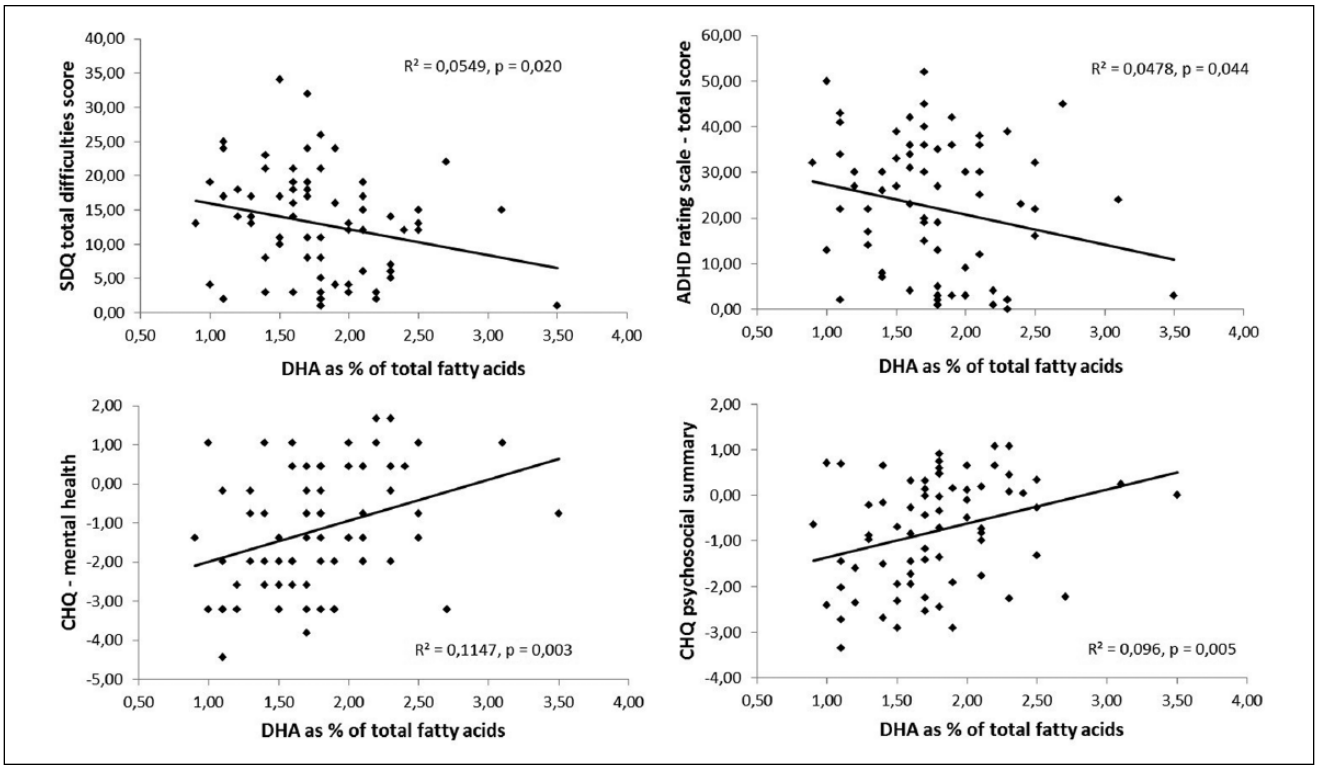

Figure 1. The relationship between DHA shown as percentage of total fatty acids in the whole blood and Strength and Difficulties Questionnaire–total difficulties score (upper left panel), ADHD rating scale–total score (upper right panel), Child Health Questionnaire–mental health score (lower left panel), and Child Health Questionnaire–psychosocial summary (lower right panel).

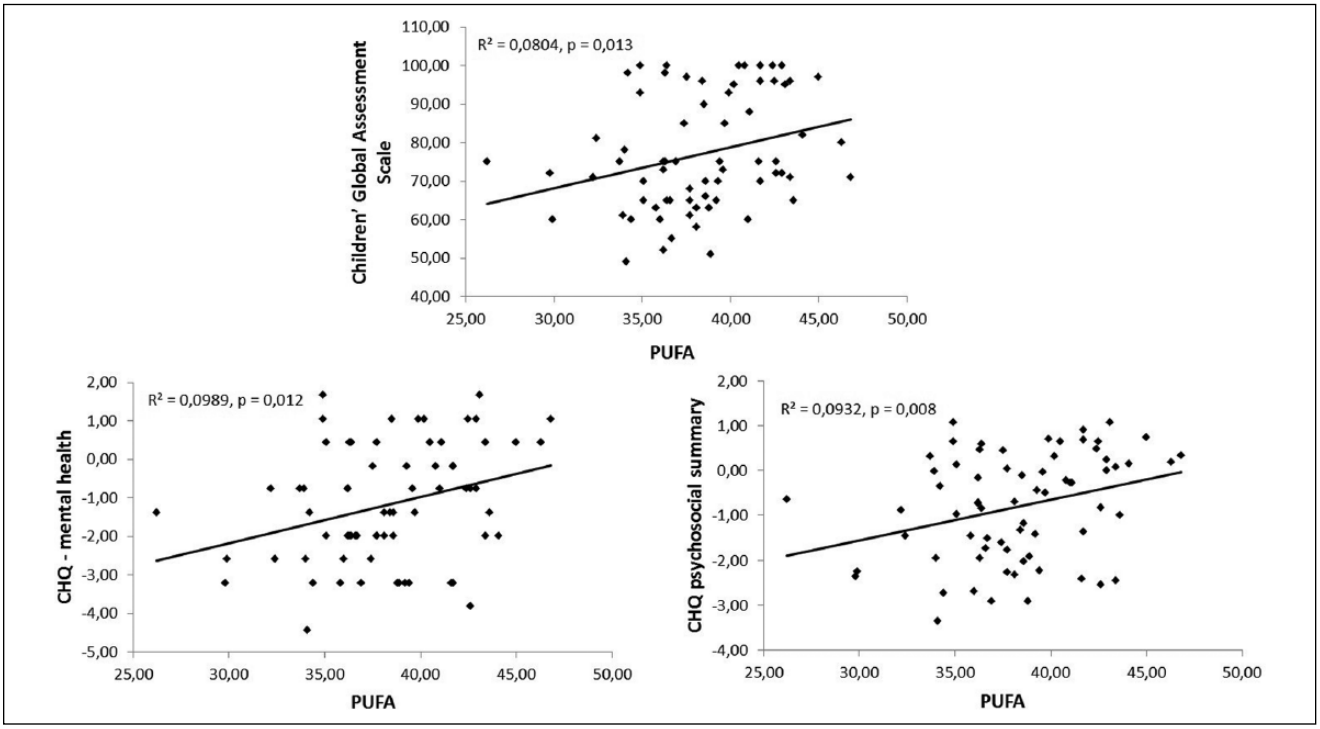

Figure 2. The relationship between PUFA and Children's Global Assessment scale (upper panel), Child Health Questionnaire–mental health score (lower left panel), and Child Health Questionnaire–psychosocial summary (lower right panel).

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A Regional ADHD Center-Based Network Project for the Diagnosis and Treatment of Children and Adolescents With ADHD

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Abstract

Objective: We aimed to define the sociodemographic, clinical, and prescription profiles of the participants enrolled in the Italian Lombardy ADHD Register. **Method:** Data on patients evaluated by the 18 regional ADHD reference centers in the 2012 to 2013 period were analyzed. **Results:** Seven hundred fifty-three of 1,150 (65%) suspected patients received a diagnosis of ADHD. In 24% of cases, there was a family history of ADHD. Four hundred eighty-three (64%) patients had at least one psychopathological disorder, the more common of which were learning disorders (35%). Eighty-four percent of patients received a prescription for psychoeducational interventions, 2% received only pharmacological treatment, and 14% a combination of both. Compared with patients treated with psychoeducational intervention alone, patients with drug prescriptions more commonly presented values of Clinical Global Impressions - Severity scale (CGI-S) of 5 or higher ($p < .0001$). **Conclusion:** A continuous and systematic monitoring of patterns of care is essential in promoting significant improvements in clinical practice and ensuring an efficient and homogeneous quality of care. *(J. of Att. Dis. 2018; 22(12) 1173-1184)*

Keywords

attention deficit disorder, child, adolescent, register, clinical protocol, mental health services

ADHD is a neurobiological disorder (Williams et al., 2010) characterized mainly by clinical manifestations such as difficulty in paying attention, impulsive behavior, and a heightened level of physical activity, occurring more frequently and intensely than in other children of the same age or developmental level (Verkuijl, Perkins, & Fazel, 2015). ADHD symptoms usually become more evident in school aged children, are more frequent in boys than girls (ratio 3:1), and tend to persist into adulthood (Centers for Disease Control and Prevention [CDCP], 2013).

Despite a pooled worldwide ADHD prevalence in children and adolescents of 5.3%, there is wide variability between and within countries (Polanczyk, de Lima, Horta, Biederman, & Rohde, 2007). In Italy, the reported prevalence rates range from 1.3 to 7.0 (Bianchini et al., 2013; Donfrancesco et al., 2014; Gallucci et al., 1993; Mugnaini et al., 2006; Zuddas et al., 2006). Such variability in prevalence rates may be explained by the different methodologies, diagnostic procedures, and criteria used in the studies (Faraone, Sergeant, Gillberg, & Biederman, 2003; Thomas, Sanders, Doust, Beller, & Glasziou, 2015; Willcutt, 2012),

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as well as by the different settings considered, and, for some authors, also the different cultural approaches (Timimi, 2005). According to national and international guidelines (ADHD Italian Consensus Conference, 2003; Canadian Attention Deficit Hyperactivity Disorder Resource Alliance [CADDRA], 2011; National Institute for Health and Care Excellence [NICE], 2008; Pliszka & AACAP Work Group on Quality Issues, 2007; SINPIA, 2002), ADHD treatment should be based on a multimodal approach combining psychosocial interventions with pharmacological therapies and should take into consideration the patient's characteristics, including age, symptom severity, comorbid disorders, cognitive level, and social and family context. Psychological therapies include parent and teacher training interventions and a range of cognitive behavioral approaches for the patient, whereas pharmacological treatments include psychostimulants (in particular methylphenidate) as first-choice drugs prescribed as part of a multimodal treatment plan, and should be considered when psychological treatments alone are insufficient and severe ADHD is present.

According to some authors, the prevalence of ADHD has risen significantly over the past decade (CDCP, 2010; Evans, Morrill, & Parente, 2010; Morrow et al., 2012; G. Polanczyk et al., 2007), as have the prescribing rates of the drugs commonly used in the treatment of ADHD (Hodgkins, Sasané, & Meijer, 2011; McCarthy et al., 2012; Stephenson, Karanges, & McGregor, 2013; Zuvekas & Vitiello, 2012). However, although in recent years issues concerning the overdiagnosis and overtreatment of ADHD have been extensively discussed (Thomas, Mitchell, & Batstra, 2013), when standardized diagnostic and impairment assessment procedures are followed, prevalence seems neither to have changed over time nor to differ in the geographic locations considered (G. V. Polanczyk, Willcutt, Salum, Kieling, & Rohde, 2014).

Following a previous, national, drug-oriented ADHD registry set up in 2007 (Didoni, Sequi, Panei, Bonati, & Lombardy ADHD Registry Group, 2011; Panei et al., 2004), in June 2011 an official, alternative regional registry was activated in the Lombardy Region. The Regional ADHD Registry was, indeed, designed as a disease-oriented registry collecting information not only on ADHD patients treated with pharmacological therapy (as provided by the National Registry) but also on all patients who access ADHD centers for a diagnosis of suspected ADHD. According to existing legislation (Gazzetta Ufficiale, 2003), compilation of the registry is mandatory for all ADHD patients receiving methylphenidate or atomoxetine treatment.

The Regional Registry is part of a more general project aimed to ensure appropriate ADHD management for every child and adolescent once the disorder is suspected and reported, and includes commonly acknowledged diagnostic and therapeutic procedures as well as educational initiatives for health care workers (child psychiatrists and psychologists) of the Lombardy Region health care system who provide assistance to ADHD patients and their families. Initiatives focused on increasing knowledge on ADHD in parents, teachers, and family pediatricians were also part of the regional project.

The main aim of this study was to describe the diagnostic assessment and therapeutic approaches in children and adolescents aged 5 to 17 years enrolled in any of the 18 ADHD reference centers of the Lombardy Region between January 2012 and December 2013 for suspected ADHD.

Method

This study was designed as a review of patient medical records identified from the Regional ADHD Registry database. The research was approved by the Institutional Review Board of the IRCCS—Istituto di Ricerche Farmacologiche "Mario Negri," Milan, Italy; and, written informed consent was obtained for all patients.

The Local Health Setting

In the Lombardy Region, health care is provided free or at a nominal charge through a network of 15 local health units (LHUs), and to about 15% of the Italian pediatric population. Child mental health care is provided through a network of 34 Child and Adolescent Neuropsychiatric Services (CANPS) that provide care at the hospital (Tier 3) and community (Tier 2) levels for children and adolescents with neurologic, neuropsychologic, and/or psychiatric disorders and for their families. CANPS are multiprofessional, comprehensive, community services providing diagnosis, treatment, and rehabilitation. They work mainly on an outpatient basis and in close connection with educational and social services. Regional health authorities are responsible for the accreditation of 18 of the 34 CANPS as specialized hubs (Tier 3) of the CANPS network on ADHD ("ADHD centers"). All CANPS are able to take care of children with ADHD and their families, whereas ADHD centers are responsible for confirming uncertain diagnosis and verifying the appropriateness of the therapeutic plan prescribed. The support of ADHD centers can be activated by the CANPS if needed. ADHD centers are also responsible for the prescription of pharmacological therapies and their monitoring over time. Moreover, ADHD centers are responsible for inputting data into the registry; for providing parent, teacher, and child training; and for supporting CANPS networks in improving ADHD care in the Lombardy Region. All these activities are part of a specific project supported by the Regional Health Ministry.

The Lombardy ADHD Registry Project

The Regional ADHD Registry represents a distinctive tool, internationally, aimed to ensure the appropriate care of, and the safety of drug use in, ADHD children (Bonati & Reale, 2013). In practice, a strict diagnostic assessment of the disorder prior to treatment, as well as its systematic monitoring during both pharmacological treatment and behavioral interventions, must be guaranteed to ADHD patients who come to the attention of the 18 local ADHD centers accredited by the regional health authorities.

To define an optimal, evidence-based, shared strategy for diagnostic evaluation, an ad hoc assessment team was created, involving a child psychiatrist and a psychologist from each participating ADHD center and a group of researchers at the coordinating center (IRCCS—Istituto di Ricerche Farmacologiche "Mario Negri"). More specifically, this strategy consisted of seven mandatory steps to be applied at the time of diagnostic evaluation. This first evaluation included the clinical anamnestic and psychiatric interview, the neurological examination, the evaluation of cognitive level by Wechsler Scales (Wechsler, 1991, 2002, 2003), the Schedule for Affective Disorders and Schizophrenia for School-Age Children (K-SADS; Kaufman et al., 1997) for a complete psychopathology overview and comorbidity assessment, the Child Behavior Checklist (CBCL) and/or the Conners' Parent Rating Scale–Revised (CPRS-R) rated by parents, the Conners' Teacher Rating Scale–Revised (CTRS-R) rated by teachers (Achenbach & Eofbrock, 1983; Conners, Sitarenios, Parker, & Epstein, 1998; Goyette, Conners, & Ulrich, 1978), and the Clinical Global Impressions - Severity scale (CGI-S; Guy, 1996) to quantify symptoms severity. This diagnostic pathway was agreed, approved, and shared by all participating ADHD centers.

Following a diagnosis of ADHD, the registry was designed to provide several, differently structured types of follow-up visits at periodic intervals to monitor the clinical outcome of the treatment strategies. These were carried out at 3 and 6 months after the diagnosis, and every 6 months afterward. Patients given methylphenidate were also monitored at 1 week and 1 month after the diagnosis (only after 1 month if they received atomoxetine).

All collected data, that is, those concerning the diagnostic evaluation and the systematic monitoring assessments described above, were analyzed monthly, and the findings were reported and periodically discussed with all 18 ADHD centers belonging to the Lombardy ADHD Group.

Moreover, because of the concern about safety and overuse of drugs in ADHD, as well as of overdiagnosis (Bonati & Reale, 2013), a permanent group focusing on specialized training for the child psychiatrists and psychologists of the 18 ADHD centers was established. Additional educational events were also provided for family pediatricians, parents, teachers, and other health professionals who are not part of the Lombardy ADHD group, to diffuse more comprehensive knowledge on ADHD based on recent evidence-based practices and guidelines.

Specific, preidentified benchmarks of these project activities were established and monitored over time to achieve clinical improvement, through the use of systematic, data-guided activities, the continuous mapping of the characteristics of the targeted clinical environments, and an iterative system evaluation to test the change, according to the main clinical quality improvement features (see supplemental table; Rubenstein et al., 2014). However, the global evaluation of the system and outcome is beyond the scope of this report. Here, we report clinical and service assessment data on patients who first accessed the ADHD centers between January 2012 and December 2013.

Data Analyses

All data were entered in an SAS/STAT database (SAS Version 9, SAS Institute, Inc., Cary, NC, USA). Descriptive statistics were computed for the entire study population and for subgroups. The student's *t* test was used to compare continuous variables, whereas chi-square tests were used to compare categorical variables. A multivariate logistic regression analysis with stepwise selection was also carried out to assess the determinants of disease and treatment. Moreover, interrater agreement (parents CPRS vs. teachers CTRS and mother CBCL vs. father CBCL) on symptom scores for each subscale was established by Kappa coefficient of agreement (*K*). The results are presented as the number, frequency (%), and mean or median; $p < .05$ was considered to be significant.

Results

Regional ADHD Registry Data

The data concerning 1,290 children and adolescents who accessed 1 of the 18 ADHD centers for the first time during the period considered (range = 19-152 patients per center, median = 54) for suspected ADHD were analyzed.

The majority of patients (1,150, 89%) had completed the diagnostic evaluation at the time of data extraction (September 1, 2014; Table 1). These patients had a median age of 9 years (range = 5-17 years) at their first visit, and 982 (85%) were males and 168 (15%) were females. In all, 753 patients (65%) met *Diagnostic and Statistical Manual of Mental Disorders* (4th ed., text rev.; *DSM-IV-TR*; American Psychiatric Association [APA], 2000) criteria for ADHD diagnosis: 653 (87%) males and 100 (13%) females.

The cumulative incidence of ADHD in the 2012 to 2013 period from the ADHD centers' viewpoint is therefore estimated to be 0.63% (95% confidence interval [CI] = [0.59, 1.31]), with a peak at 8 years of age (Figure 1).

Table 1. Demographic and Clinical Characteristics of the Sample Population.

Characteristics	Total sample (*N* = 1,150)	With ADHD (*n* = 753)	Without ADHD (*n* = 397)	Univariate model *p*	Multivariate model OR (95% CI)
Age *M* (*SD*); median	9.3 (2.4); 9	9.1 (2.4); 9	9.7 (2.5); 9	.0005	
5-11, *n* (%)	912 (80)	611 (82)	301 (77)	.0460	
12-17, *n* (%)	230 (20)	138 (18)	92 (23)		
Male:Female	982:168	653:100	329:68		
Only child, *n* (%)	268 (23)	189 (25)	79 (20)	.0456	
Born abroad, *n* (%)	59 (5)	45 (6)	14 (4)		
Adopted, *n* (%)	40 (3)	34 (5)	6 (2)	.0082	
School variables, *n* (%)					
Grade					
Primary	849 (74)	571 (76)	278 (71)	.0475	1.46 [1.09, 1.96]
Middle	294 (26)	179 (24)	115 (29)		
Repeaters	63 (5)	37 (5)	26 (7)		
Support teacher	93 (8)	80 (11)	13 (3)	<.0001	3.33 [1.72, 6.42]
Parent/family variables, *n* (%)					
High school graduate					
Mother	629 (63)	394 (62)	235 (65)		
Father	509 (52)	324 (52)	185 (53)		
Employed					
Mother	697 (72)	442 (74)	255 (68)	.0401	
Father	918 (94)	580 (94)	338 (94)		
Family history of ADHD	233 (20)	178 (24)	55 (14)	<.0001	1.87 [1.33, 2.65]
Anamnestic data, *n* (%)					
Pregnancy					
Cesarean section	294 (26)	205 (27)	89 (22)	.0449	
Preterm (<37 weeks)	111 (10)	74 (10)	37 (10)		
Low weight (<2,500 g)	95 (9)	63 (9)	32 (9)		
Motor delay	49 (4)	35 (5)	14 (4)		
Language delay	238 (21)	170 (23)	68 (17)	.0219	
Psychiatric disorders, *n* (%)					
One or more	716 (62)	483 (64)	233 (59)		
Learning disorders	404 (35)	267 (35)	137 (35)		
Sleep disorders	130 (11)	102 (14)	28 (7)	.0009	2.04 [1.28, 3.27]
Oppositional defiant disorder	119 (10)	97 (13)	22 (6)	.0001	2.51 [1.47, 4.30]
Anxiety disorders	99 (9)	60 (8)	39 (10)		
Intellectual disability	55 (5)	38 (5)	17 (4)		
Mood disorders	39 (3)	25 (3)	14 (4)		
Language disorders	38 (3)	29 (4)	9 (2)		
Tic disorders	20 (2)	15 (2)	5 (1)		
Conduct disorders	19 (2)	12 (2)	7 (2)		
Autism spectrum disorders	12 (1)	5 (1)	7 (2)		
DCD	13 (1)	5 (1)	8 (2)		
Other chronic medical conditions, *n* (%)					
One or more	105 (9)	68 (9)	37 (9)		
Neurological diseases	36 (3)	28 (4)	8 (2)		
Respiratory diseases	27 (2)	18 (2)	9 (2)		
Gastrointestinal diseases	10 (1)	4 (1)	6 (2)		
Other	43 (4)	26 (3)	17 (4)		

Note. OR = odds ratio; CI = confidence interval; DCD = developmental coordination disorder.

As shown in Table 1, the anamnestic characteristics significantly associated with ADHD by univariate analysis were lower age, "only child," adopted, ADHD familiarity, caesarean delivery, and language delay. According to both univariate and multivariate analyses, presence of support teacher (at the time of assessment; odds ratio [OR] = 3.33,

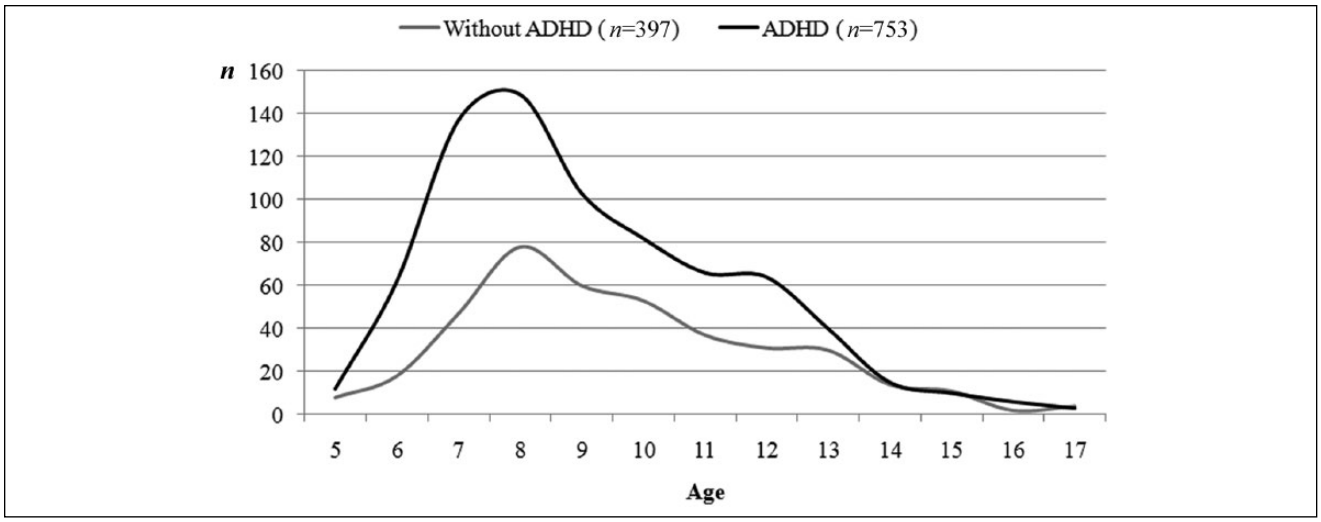

Figure 1. Age of the sample population.

95% CI = [1.72, 6.42]), ADHD familiarity (OR = 1.87, 95% CI = [1.33, 2.65]), and primary school attendance (OR = 1.46, 95% CI = [1.09, 1.96]) were higher in ADHD patients. In all, 716 of 1,150 (62%) enrolled patients had one or more psychiatric disorders (233 without ADHD), whereas 105 (9%) had another concomitant chronic disorder. Oppositional defiant disorder was higher in ADHD patients (OR = 2.51, 95% CI = [1.47, 4.30]), as were sleep problems (OR = 2.04, 95% CI = [1.28, 3.27]). Among the medical conditions, neurological diseases were the most frequent (n = 36, 3%).

ADHD Treatment

Overall, 753 patients with ADHD received at least one prescription: 100 patients (14%) received a combination of pharmacotherapy and psychoeducational intervention, 15 patients (2%) received pharmacotherapy alone, and 638 patients (84%) received psychoeducational intervention alone. Of the 115 patients treated with a psychoactive drug, 95 (83%) received methylphenidate (5-40 mg daily), 5 of whom in combination with an additional drug (haloperidol, risperidone, valproate, sertraline, hydroxyzine, or melatonin), 8 (7%) atomoxetine (10-75 mg daily), and 12 (10%) other psychotropic drugs. Among the 738 patients prescribed psychoeducational intervention, 521 (71%) received at least one type of training intervention (parent, teacher, or child), whereas 217 (29%) received other psychoeducational interventions. The most commonly prescribed intervention was parent training (n = 428, 82%), followed by child training (n = 308, 59%) and teacher training (n = 173, 33%). A total of 96 (13%) patients received a prescription for all training types.

In all, 440 patients (58%) had an ADHD of Combined subtype (ADHD-C), whereas 234 (31%) showed the Inattentive (ADHD-I) and 79 (10%) the Hyperactive–Impulsive (ADHD-HI) subtypes. All 753 patients received a prescription (Table 2).

Patients diagnosed with an ADHD-C subtype were more likely to be treated also with drug therapy (Drug-treated) than psychoeducational treatment alone (P-treated; Drug-treated: n = 91, 79%; P-treated: n = 349, 55%; $p < .0001$). Conversely, patients diagnosed with an ADHD-I subtype were more likely to be treated with psychoeducational treatment alone (Drug-treated: n = 14, 12%; P-treated: n = 220, 34%; $p < .0001$). Univariate analysis between Drug-treated and P-treated patients detected several significant differences, as shown in Table 2. Multivariate analysis found that a CGI-S score of 5 or above (OR = 4.15, 95% CI = [2.17, 7.92]), an ADHD-C diagnosis (OR = 3.07, 95% CI = [1.33, 7.08]), and a pathological score on the CPRS-Inattention (OR = 2.89, 95% CI = [1.25, 6.72]) and on the CPRS-Hyperactivity scales (OR = 2.61, 95% CI = [1.09, 6.27]) were associated with a higher probability of receiving drug therapy in addition to psychoeducational treatment.

The rate of drug users among children and adolescents with ADHD was 16% and was associated with a higher clinical severity score (CGI-S ≥ 5; OR = 4.8, 95% CI = [2.6, 8.8]).

Comparison of Mother, Father, and Teacher Scale Ratings

To evaluate the parents' and teachers' perceptions of symptoms and behavior of ADHD children, a comparison of the Conners' Rating Scales and the CBCL reports was performed (Table 3). Table 3 presents the rate of ADHD patients who, according to established norms, had scores within the pathological range between parent and teacher ratings on the Conners' Rating Scales and between mother

Table 2. Clinical Characteristics of the ADHD Sample by Treatment Prescription.

Characteristics	Total ADHD (*n* = 753)	Psychological treatment (*n* = 638)	Drug treatment (*n* = 115)	Univariate model *p*	Multivariate model OR (95% CI)
ADHD subtype, *n* (%)					
Combined	440 (58)	349 (55)	91 (79)	<.0001	3.07 [1.33, 7.08]
Inattentive	234 (31)	220 (34)	14 (12)		
Hyperactive–impulsive	79 (10)	69 (11)	10 (9)	<.0001	
IQ level, *M* (*SD*)					
Total	440 (58)	349 (55)	91 (79)	.0019	
Conners' Rating Scale, *n* (%)					
Oppositional (subscale A)					
Parent	294 (43)	232 (40)	62 (63)	<.0001	
Teacher	285 (45)	238 (43)	47 (59)	.0094	
Inattention (subscale B)					
Parent	484 (71)	402 (69)	82 (85)	.0027	2.61 [1.09, 6.27]
Teacher	388 (62)	336 (61)	52 (65)		
Hyperactivity (subscale C)					
Parent	425 (62)	346 (59)	79 (81)	<.0001	2.89 [1.25, 6.72]
Teacher	418 (66)	353 (64)	65 (81)	.0025	
ADHD Index (subscale H)					
Parent	543 (80)	456 (78)	87 (89)	.0150	
Teacher	511 (81)	442 (80)	69 (86)		
Emotional Lability (subscale J)					
Parent	257 (38)	207 (35)	50 (51)	.0032	
Teacher	300 (48)	253 (46)	47 (59)	.0329	
Child Behavior Checklist, *n* (%)					
Internalizing symptoms					
Mother	62 (21)	42 (18)	20 (34)	.0077	
Father	36 (15)	21 (11)	15 (31)	.0008	
Externalizing symptoms					
Mother	79 (27)	53 (23)	26 (44)	.0010	
Father	55 (23)	38 (20)	17 (35)	.0341	
Total					
Mother	111 (38)	76 (33)	35 (58)	.0003	
Father	67 (28)	47 (25)	20 (41)	.0302	
CGI-S, *n* (%)					
<5	280 (56)	257 (62)	23 (28)	<.0001	4.15 [2.17, 7.92]
≥5	218 (44)	158 (38)	60 (72)		
Psychiatric comorbidities, *n* (%)					
One or more	484 (64)	387 (61)	97 (84)	<.0001	
Learning disorders	267 (35)	228 (36)	39 (34)		
Sleep disorders	102 (14)	75 (12)	27 (23)	.0007	
Oppositional defiant disorder	97 (13)	58 (9)	39 (34)	<.0001	
Anxiety disorders	60 (8)	44 (7)	16 (14)	.0105	
Intellectual disability	37 (5)	24 (4)	13 (11)	.0006	
Language disorders	29 (4)	23 (4)	6 (5)		
Mood disorders	26 (3)	17 (3)	9 (8)	.0105	
Tic disorders	15 (2)	7 (1)	8 (7)	.0006	
Conduct disorder	12 (2)	7 (1)	5 (4)	.0247	
DCD	6 (1)	5 (1)	1 (1)		
Autism spectrum disorders	5 (1)	3 (—)	2 (2)		

Note. OR = odds ratio; CI = confidence interval; CGI-S = Clinical Global Impression–Severity; DCD = developmental coordination disorder.

Table 3. Rate of Participants With Scores Within the Pathological Range on the Conners' and CBCL Scales.

Conners' Rating Scales (n = 610)					
Subscales	CPRS-R n (%)	CTRS-R n (%)	p	K	Agreement (%)
Oppositional (subscale A)	263 (43)	275 (45)		.28	65
Inattention (subscale B)	432 (71)	374 (61)	.0005	.25	66
Hyperactivity (subscale C)	372 (61)	405 (66)	.0495	.30	67
ADHD Index (subscale H)	485 (80)	494 (81)		.13	72
Emotional Lability (subscale J)	234 (38)	292 (48)	.0008	.31	66
CBCL (n = 223)					
Subscales	Mothers n (%)	Fathers n (%)	p	K	Agreement (%)
Internalizing Problems	48 (22)	32 (14)	.0483	.67	90
Externalizing Problems	55 (25)	52 (23)		.72	90
Total	83 (37)	63 (28)	.0436	.58	81

Note. CBCL = Child Behavior Checklist; CPRS-R = Conners' Parent Rating Scale–Revised; CTRS-R = Conners' Teacher Rating Scale–Revised.

and father ratings on the CBCL reports. Parents consistently rated their children higher than teachers on the Cognitive Problems/Inattention subscale (B) of the CPRS, with a number of participants with scores within the pathological range according to the parents' ratings that was significantly larger than that calculated from CTRS teachers' answers (CPRS-B, n = 432,71%; CTRS-B, n = 374, 61%; p = .0005). Comparison of the rates using the Hyperactivity (C) subscale (CPRS-C, n = 372, 61%; CTRS-C, n = 405, 66%; p = .0495) and the Emotional Lability (J) subscale (CPRS-J, n = 234, 38%; CTRS-J, n = 292, 48%; p = .0008) yielded different results, with a higher rate of participants' scores in the pathological range when rated by teachers than by parents. On the CBCL questionnaire, pathological mothers' ratings were significantly higher than those of fathers on the CBCL–Internalizing (I) subscale (CBCL-I, n = 48, 22%; CBCL-I father, n = 32, 14%; p = .0483), and on the CBCL–Total (T) subscale (CBCL-T, n = 83, 37%; CBCL-T father, n = 63, 28%; p = .0436).

Kappa values showed "substantial" agreement between parents and teachers (>60%) and "excellent" (>80%) between mothers and fathers.

Continuity of Care and Management

Data on patient care from the time of the first request to the diagnosis, and data on treatment prescriptions and follow-up visits, were systematically collected through the regional database system. The registry data from the 18 ADHD centers were analyzed and were found to have a high level of completeness and accuracy. Figure 2 reports the rate of completion of the diagnostic evaluation, according to the project guidelines: each axis ranges from 0% to 100% and represents one of the seven areas of the shared evaluation pathway, while the three sets of data represent the performance scores of the most (average = 99.1%) and least compliant (average = 81.7%) ADHD center, as well as the total completeness (average = 93.6%) estimated by the analysis of data recorded by all 18 ADHD centers.

Moreover, combined data from the registry database and preidentified benchmarks collected over time showed a reduction in the heterogeneity of clinical care management among the 18 centers (i.e., waiting time for the first visit, time of diagnostic assessment, treatment prescriptions, etc.). Overall, 67 of 753 (9%) patients who received a diagnosis of ADHD were discharged (71% of whom during the first 3 months), whereas the remaining 686 patients (91%) were followed up by the ADHD centers at periodic intervals, according to the prescribed treatments. At the time of data extraction, 466 (62%) patients with ADHD had been monitored in a systematic manner for more than 1 year from the time of diagnosis.

Discussion

To the best of our knowledge, this study, as part of a multimodal project, represents the first systematic evaluation of the diagnostic-therapeutic approaches in a large population of patients with ADHD. In this sample, the size of the population with ADHD accessing ADHD centers was lower than expected, taking into account previously observed prevalence rates in both national and international contexts (1% to 12%; Arruda, Nardini Querido, Bigal, & Polanczyk, 2015; Bianchini et al., 2013; Donfrancesco et al., 2014; Faraone et al., 2003; Gallucci et al., 1993; Mugnaini et al., 2006; G. Polanczyk et al., 2007; G. V. Polanczyk, Salum, Sugaya, Caye, & Rohde, 2015; Thomas et al., 2015; Zuddas et al., 2006). These findings were, in part, expected considering that ADHD centers collect only part of the regional ADHD population because they are aimed at patients who present diagnostic or therapeutic doubts or complexities, or who are in need of pharmacological treatment, that justify

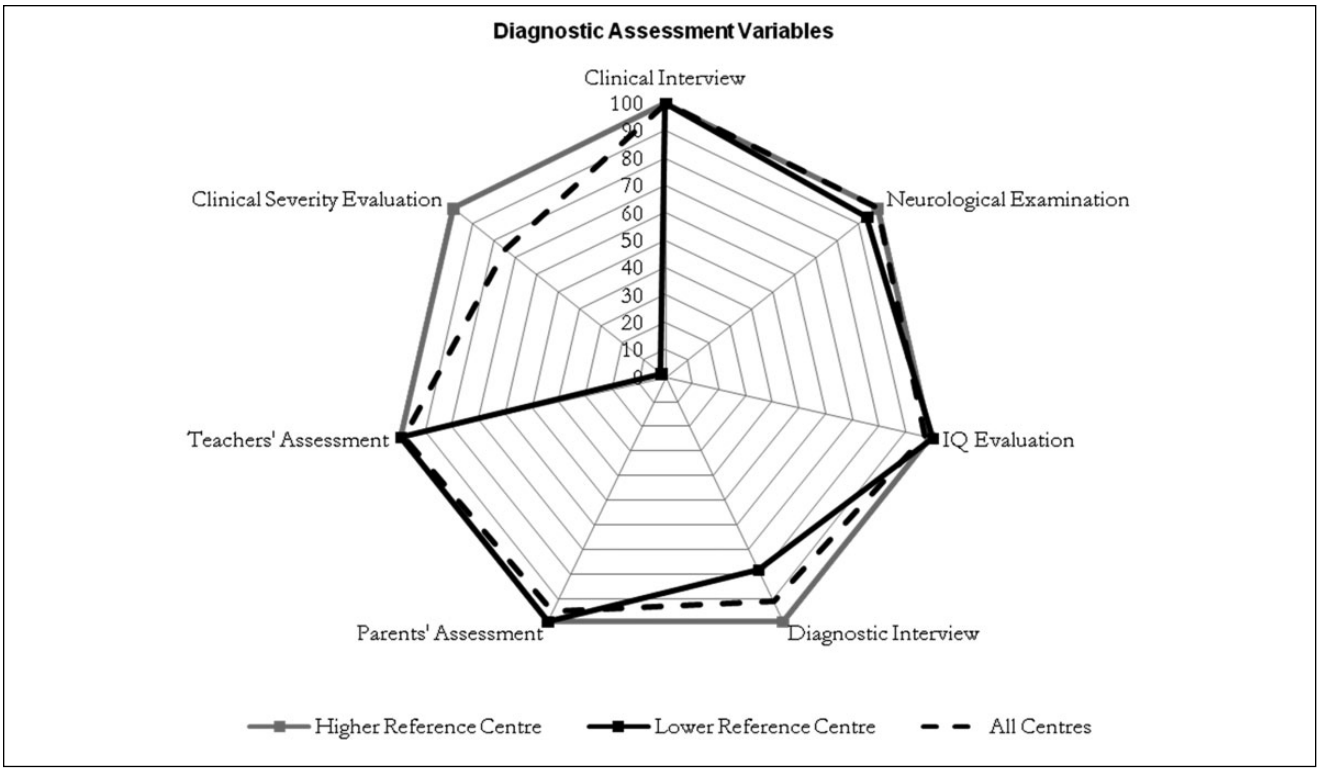

Figure 2. Rate of completeness levels based on data inputted into the registry.

referral, and ADHD centers are directly involved in the community activity of 18 of 34 existing CANPS. Moreover, it is known worldwide that only a very limited number of children and adolescents with mental health needs have access to care (Kieling et al., 2011), and Italy is no exception: access to CANPS happens only in 1 case every 2 for children with a neuropsychiatric disorder in the age range 10 to 14 (Clavenna et al., 2013), and only 14% of adolescents with emotional and behavioral problems consult a mental health service (Frigerio et al., 2009). The low prevalence of ADHD in regional ADHD centers may therefore also reflect significant, unmet mental health needs in children with ADHD. In line with other studies (APA, 2000; Canino et al., 2004), it should also be taken into account that the rigorous, systematic, monitored (controlled) methodology for diagnostic assessment that was defined and implemented by the clinicians working in the ADHD centers participating in the project and that summarized information from different evaluators, may have affected the estimates. Thus, comparison with findings from other studies such as Mugnaini et al. (2006), evaluating 1,891 participants aged 6.6 to 7.4 years, and reporting an ADHD prevalence rate of 7.1%, found through the sole use of teacher rating scales, may be inappropriate.

The rate of psychiatric comorbidity (64%) found is consistent with previously observed rates, although estimated rates of externalizing disorders, such as oppositional defiant disorder (13%) and conduct disorders (2%), were lower compared with those of other studies (Costello, Mustillo, Erkanli, Keeler, & Angold, 2003; Fleitlich-Bilyk, & Goodman, 2004; Ford, Goodman, & Meltzer, 2003; Jensen et al., 2001; Steinhausen, 2006). The findings of the present study, however, are similar to those reported by Frigerio et al. (2009) from the preadolescent mental health project that showed, in a general population of 3,418 Italian adolescents aged 10 to 14 years, a much lower rate of externalizing disorders (1.2%) than European and international estimates.

Although the presence of learning difficulties (35%) and support teachers (11%) are associated with an increased probability of receiving an ADHD diagnosis, the study design does not allow the causal direction of the effect to be clarified.

Among the clinical characteristics, the variable that resulted significantly associated with the prescription of a pharmacological treatment was impairment severity, which was based on the assessment of symptoms and behavior, and functional impairment (CGI-S). This finding is in agreement with recommendations from national and European guidelines (NICE, 2008; SINPIA, 2002). Psychopharmacological treatment in Italian children and adolescents is not the norm, and prescription rates for mental disorders are relatively low (Clavenna, Rossi, Derosa, & Bonati, 2007). In the present study, only 16% of ADHD patients were treated pharmacologically, compared with higher rates reported in other countries (Scheffler, Hinshaw, Modrek, & Levine, 2007), suggesting that also for ADHD,

the cultural education and disposition, and the professional attitude of the majority of the child psychiatrists of the Lombardy Region's mental health services, are more inclined toward behavioral treatments than the use of drugs.

Moreover, the collaborative aspects and the chosen approaches of the project created opportunities for continuous improvement in shared processes of care in all the 18 ADHD centers. This represents an added value of the initiative, supporting the endorsement of continuous quality improvement as an essential approach, also in CANPS, to facilitate and guarantee quality of care (Rubenstein et al., 2014).

Conclusion

This study shows how the Regional ADHD Registry, as part of a larger, multimodal project, represents a distinctive tool—a unique experience in the international context—for ensuring shared pathways of care in ADHD children. The registry has revealed itself to be an essential tool for a continuous, systematic monitoring that allows resources to be invested appropriately, based on documented needs, thus promoting progressive, significant improvements in clinical practice and ensuring an efficient and homogeneous quality of care. Moreover, the experience acquired with the ADHD project can be useful if applied to improve care for other psychiatric disorders in childhood.

In times when overdiagnosis, disease mongering, and globalization of ADHD (Conrad & Bergey, 2014; King, Jennings, & Fletcher, 2014) are potential risks, the availability of adequate resources to provide care and appropriate training initiatives involving professionals, parents, and teachers, as done through the Lombardy Region project, may be an effective initiative of contrast and prevention.

Key Points

- Worldwide there is wide variability between and within countries on ADHD prevalence in children and adolescents that often corresponds to different monitoring viewpoints, diagnostic procedures used, and access to mental health services.
- The Regional ADHD Registry, as part of a larger, multimodal project, represents a distinctive tool for ensuring appropriate diagnostic and therapeutic pathways of care in ADHD children.
- The experience acquired with the ADHD project can be useful if applied to improve care for other psychiatric disorders in childhood.

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Author Contributions

M.B. coordinated the study with the help of the Lombardy ADHD Group. M.B., L.R., M.Z., M.C., and F.F. analyzed the data and prepared the results. M.B. and L.R. wrote the first draft of the report. M.B. and A.C. participated in the design and establishment of the study. All authors edited the report. All participants of Lombardy ADHD Group discussed and approved the final version. M.B. is the guarantor.

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Supplemental Material

The data supplements are available at http://jad.sagepub.com/supplemental

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EDITORIALE

Continuità degli affetti, continuità delle cure

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Quando episodi esecrabili succedono non si possono ignorare o rimuovere dalla memoria attribuendoli al caso o alla fatalità. Bisognerebbe invece individuarne le cause, riflettere e adoperarsi affinché non si ripetano. Purtroppo gli episodi di dimenticanza e abbandono si ripetono[2]. Storie che ci interrogano su molte questioni, alcune anche intime, ma che rimangono all'attenzione della cronaca breve tempo, senza l'adeguato approfondimento che necessiterebbero tutte le forme di informazione. Questo è quanto ha fatto seguito ai recenti episodi di Bibbiano e di Bergamo. "La magistratura farà il suo corso", senza dubbio, sebbene sia spesso un modo per guardare altrove, dimenticare, rimandare ad altri, confondere i doveri e i diritti. Perché se è un dovere quello della magistratura di individuare eventuali colpe e colpevoli, possibilmente senza confondere garantismo con impunità, è dovere di tutti i cittadini, anche se non direttamente coinvolti in questi episodi, comprenderne le (possibili) cause ed attivarsi per prevenirle. Perché è un diritto quello di avere giustizia per coloro che hanno subito torti e sofferenze, ed è un diritto quello della cittadinanza di essere adeguatamente e in modo appropriato informata per essere attiva. Bibbiano e Bergamo distano 188 km, entrambe iniziano con b e terminano con o, ma ci sono comunanze anche nei recenti fatti di "cronaca".

In entrambe le situazioni si è esercitata una coercizione facendo riferimento ad uno stato di necessità e non ad un atto "terapeutico". Ha prevalso il giudizio soggettivo dell'operatore e non l'atto condiviso nel rispetto della libertà e del consenso con il beneficiario (bambino, famiglia, paziente). È mancato in entrambe le situazioni "l'ascolto gentile"[3], un'attitudine che non è prevista nel capitolato delle risorse disponibili dei servizi, ma neppure nella cultura di molti operatori.

I bambini non devono essere solo protetti[4], ma dovrebbero essere anche tutelati. Il termine tutela rimanda ad una funzione non solo difensiva, ma propositiva, di stimolo e accompagnamento per un sano sviluppo complessivo. Chi soffre di disturbi mentali deve essere protetto, ma anche tutelato. Togliere o affidare una tutela è un atto di potere che deve essere esercitato con competenza, "affidabilità" e nell'osservanza dei diritti e dei doveri. La legge 173 del 2015 riconosce e valorizza la "continuità

Sognando
Me ne sto lì seduto e assente,
con un cappello sulla fronte
e cose strane che mi passan per la mente
Avrei una voglia di gridare,
ma non capisco a quale scopo
poi d'improvviso piango un poco
e rido quasi fosse un gioco
Se sento voci, non rispondo
Io vivo in uno strano mondo
Dove ci son pochi problemi
Dove la gente non ha schemi
Non ho futuro, né presente,
e vivo adesso eternamente
il mio passato è ormai per me distante
Ma ho tutto quello che mi serve,
nemmeno il mare nel suo scrigno
ha quelle cose che io sogno,
e non capisco perché piango
Non so che cosa sia l'amore
E non conosco il batticuore
per me la donna rappresenta
Chi mi accudisce e mi sostenta
Ma ogni tanto sento che
gli artigli neri della notte
mi fanno fare azioni non esatte
D'un tratto sento quella voce,
e qui incomincia la mia croce
vorrei scordare e ricordare,
la mente mia sta per scoppiare
E spacco tutto quel che trovo
Ed a finirla poi ci provo
Tanto per me non c'è speranza
Di uscire mai da questa stanza
Sopra un lettino cigolante,
in questo posto allucinante
io cerco spesso di volare nel cielo
Non so che male posso fare,
se cerco solo di volare
io non capisco i miei guardiani,
perché mi legano le mani →

degli affetti" nelle situazioni in cui può evolversi un affido famigliare[5], così come la precedente legge 149 del 2001[6], è tra le più avanzate a livello internazionale in materia di affido e di adozione dei minori. Tuttavia sia il documento di lavoro e di proposta dell'Autorità garante per l'Infanzia e l'Adolescenza[7] che il rapporto del Gruppo di Lavoro per la Convenzione dell'Infanzia e dell'Adolescenza sul monitoraggio della Convenzione in Italia[8] ribadiscono la disomogenea prassi locale nell'attuazione delle leggi e la necessità "di verificare, anche attraverso le relazioni semestrali dei Servizi Sociali, l'attuazione degli affidamenti disposti e del programma di assistenza al nucleo di origine da parte dei Servizi stessi". Sono trascorsi 41 anni dall'approvazione della legge 180 eppure la contenzione fisica è applica e ancora diffusa in oltre il 90% dei Servizi Psichiatrici di Diagnosi e Cura come denunciato anche da un documento del Comitato Nazionale per la Bioetica nel 2015 che ribadiva la necessità di porre "l'orizzonte bioetico con il superamento della contenzione, nell'ambito di un nuovo paradigma della cura fondato sul riconoscimento della persona come tale, nella pienezza dei suoi diritti (prima ancora che come malato e malata). Il rispetto dell'autonomia e della dignità della persona è anche il presupposto per un intervento terapeutico efficace"[9]. Pronunciamenti gravati dal peso della storia e della memoria di un passato manicomiale, di esistenze amare e offese, di sofferenze che le sentenze giudiziarie non hanno annullato[10], e che il ripetersi nel tempo seppur con minore frequenza non decolpevolizza l'intera comunità. Normative, linee guida e protocolli sono importanti, ma sono pur sempre strumenti di indirizzo per un comportamento appropriato (*care*) il cui utilizzo (attuazione nella pratica) necessita, comunque, di un continuo e sistematico monitoraggio e di una valutazione appropriata (*audit*). È, in parte, il tema del prossimo congresso nazionale dell'Associazione nazionale di epidemiologia che rifletterà sul fatto che accettare il pirandelliano principio del "così è se vi pare" non è logico, etico e neppure efficiente. E che "se un margine di variabilità nei comportamenti clinici o nelle politiche di sanità pubblica può essere accettabile, tutto dovrebbe essere sempre sottoposto a valutazione e a una verifica attenta di qualità e appropriatezza"[11].

Cosa non ha funzionato a Bibbiano e a Bergamo? La carenza di risorse, cronica in tutti i servizi pubblici nazionali e che mina drasticamente l'attività sin dai suoi "livelli essenziali" a livello locale, è continuamente denunciata dagli operatori e perennemente in attesa di essere recepita con efficaci risposte. Ma se le difficoltà di lavoro sono comuni a tutti i servizi, quanto accaduto a Bibbiano e a Bergamo contrasta con i risultati raggiunti in analoghi servizi. La carenza di risorse giustifica quindi solo una parte dei risultati ottenuti da un servizio, perché comunque si può lavorare meglio anche con risorse limitate, anche nella stessa regione. Così mentre a Bergamo la diciannovenne Elena muore senza poter sfuggire al fuoco perché legata (ricordando la stessa sorte occorsa ad Antonia nel 1974 nell'allora manicomio di Pozzuoli)[12] nella vicina ATS di Lecco è attivo un progetto per il superamento della contenzione in tutte le strutture sociosanitarie. Nel reggiano,

→ *E a tutti i costi voglion che*
Indossi un camice per me
Le braccia indietro forte spingo
E a questo punto sempre piango
Mio Dio che grande confusione,
e che magnifica visione
un'ombra chiara mi attraversa la mente
Le mani forte adesso mordo
e per un attimo ricordo
che un tempo forse non lontano,
qualcuno mi diceva: 't'amo'
In un addio svanì la voce
Scese nell'animo una pace
Ed è così che da quel dì
Io son seduto e fermo qui.

Don Backy[1]

comprensorio di Bibbiano, la sperimentazione di una forma di "welfare mix" ha caratterizzato sin dalla metà degli anni '90 le attività dei servizi sociosanitari locali, rappresentando un riferimento non solo regionale[13]. Perché allora sono successe queste tragedie? Perché proprio in contesti di (apparente) eccellenza? Perché il disagio, il dolore e la sofferenza delle famiglie e dei bambini di Bibbiano non hanno trovato altre forme di risposta? Perché il bisogno di attenzione invocato e urlato da Elena è stato "legato"? Perché in entrambi i casi non è stata garantita la continuità degli affetti e delle cure?

Nel bel film *Martin Eden* di Pietro Marcello sono i volti e le loro espressioni a fare la storia. Solitamente i volti rimangono sullo sfondo per uno spettatore che si accontenta della trama, delle sequenze coinvolgenti o degli attori principali. Ecco per comprendere la storia (nel suo insieme tra passato, presente e futuro come ha scritto Jack London in uno dei suoi più famosi romanzi e da cui è tratto il film) non ci si può soffermare e ricordare solo il naufragio del veliero o l'affondamento finale del protagonista, ma è essenziale conoscere la vita del marinaio Martin, così come quella di Elena di Bergamo o dei bambini di Bibbiano in occasione del loro subito affondamento. **R&P**

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I diritti sono per tutti i tipi di mente

L'autismo è la manifestazione delle complesse alterazioni di alcune funzioni del sistema nervoso centrale la cui causa è ancora sconosciuta. Si stima che oggi in Italia l'autismo interessi 1 bambino ogni 77, in un rapporto di 4 a 1 tra maschi e femmine. Non esiste una cura efficace e appropriata ma lo sviluppo di bambini con autismo può beneficiare di interventi comportamentali ed educativi specialistici, adeguati, precoci, duraturi, multidisciplinari e basati sulle evidenze scientifiche. Le differenze nell'utilizzo dei farmaci tra paese e paese. Posto rimedio a una iniquità italiana.

La definizione e condivisione di procedure diagnostiche appropriate e una maggior sensibilizzazione degli operatori sanitari e degli insegnanti ed educatori sono i fattori che hanno contribuito a stimare che oggi in Italia l'autismo interessa 1 bambino ogni 77, in un rapporto di 4 a 1 tra maschi e femmine.
Vuol dire che dei nati nel 2018 circa 6000 manifesteranno prima del compimento dei 3 anni una qualche forma, dalla più grave alla più lieve, di quei disturbi del neurosviluppo che compaiono in modo sfumato da farli definire "disturbi dello spettro dell'autismo" (ASD).
Vuol dire anche che oggi in Italia ci sono circa 100.000 bambini e adolescenti che per forme e gravità diverse vivono nello spettro (marcate difficoltà nell'interazione sociale e nella comunicazione; comportamenti, attività e interessi ripetitivi e stereotipati) e con loro altrettante famiglie.
L'autismo è la manifestazione delle complesse alterazioni di alcune funzioni del sistema nervoso centrale, la cui causa è ancora sconosciuta. Alcuni fattori possono contribuire insieme al manifestarsi dei sintomi in soggetti predisposti (per esempio cause ereditarie o ambientali) sebbene le modalità siano ancora sconosciute e rimangano potenziali. Comunque, l'autismo non è imputabile ai genitori, all'esposizione a metalli pesanti e neppure alle vaccinazioni dell'infanzia.

Terapie

Non esiste a tutt'oggi una cura efficace e appropriata, tuttavia lo sviluppo di bambini con autismo può beneficiare di interventi comportamentali ed educativi specialistici, adeguati, precoci e duraturi.
Gli interventi devono essere multidisciplinari e basati sulle evidenze scientifiche.
Alcuni bambini con autismo possono anche trarre beneficio dal trattamento farmacologico. Al contrario trattamenti nutrizionali (per esempio dieta priva di glutine o latticini) o terapie chelanti non sono suffragate da evidenze scientifiche.
Purtroppo l'organizzazione dei servizi per i disturbi neuropsichiatrici dell'età evolutiva e le risposte ai bisogni di cura di pazienti e famiglie si caratterizzano per l'ampia disuguaglianza territoriale, sia regionale che locale. Interventi efficaci sul percorso diagnostico, terapeutico, di non esclusione sociale sono stati individuati da numerosi progetti che attendono ancora di essere messi a sistema.
Al momento non vi è alcuna terapia farmacologica specifica per i deficit socio-comunicativi dell'ASD. Gli psicofarmaci sono utilizzati per trattare i sintomi concomitanti di iperattività, irritabilità e aggressività, spesso in associazione con approcci comportamentali ed educativi.
Circa un bambino su tre con ASD in UK è in terapia con almeno un farmaco, negli USA due ogni tre, mentre in Italia molto meno; approcci culturali diversi e attitudini terapeutiche differenti condizionano la prescrizione dei farmaci nelle diverse nazioni. Così, per esempio, le prescrizioni di antibiotici in Italia ai bambini e agli adolescenti sono almeno il triplo che in Inghilterra, ma quelle degli psicofarmaci solo un terzo di quelle inglesi a parità di indicazione.
A contribuire alle differenze di utilizzo dei farmaci tra le nazioni bisogna inoltre contemplare i criteri, le ragioni e le normative di registrazione e di distribuzione dei farmaci nei singoli Paesi.
Succede quindi che un farmaco possa essere venduto in una nazione e non in un'altra confinante. Oppure che in una nazione sia registrato e distribuito per una indicazione, mentre in una nazione confinante registrato e distribuito anche per altre indicazioni o per età differenti.

Diritto alla salute

I farmaci antipsicotici atipici (risperidone e aripiprazolo) sono risultati efficaci nel ridurre i comportamenti problematici e ripetitivi nei bambini con autismo, eppure la loro licenza d'uso negli USA e in Europa è differente, sebbene le ditte produttrici siano le stesse.
Negli USA i due farmaci possono essere prescritti anche per l'irritabilità associata a ASD, mentre in Europa questa indicazione non è contemplata, sebbene le linee guida internazionali e numerosi studi clinici ne documentino l'efficacia (seppur parziale).
Le decisioni spettano alle ditte produttrici secondo il loro interesse, ma anche alle Agenzie Regolatorie nazionali nell'interesse dei pazienti di disporre dei farmaci più appropriati in termini di efficacia e sicurezza.
A tutt'oggi la prescrizione di questi due farmaci per l'ASD in Italia erano cosiddette *off-label* (fuori dalle indicazioni) con la conseguenza che i pazienti (le famiglie) dovevano pagarseli (anche alcune centinaia di €/anno).
Per far fronte a questa iniqua situazione l'Istituto si è attivato presso l'Agenzia Italiana del Farmaco (Aifa) presentando una richiesta formale supportata da ampia documentazione scientifica affinché anche in Italia, come negli USA, il farmaco fosse prescrivibile anche per i disturbi associati all'ASD e fosse rimborsabile dal SSN. Al termine dell'iter valutativo la richiesta è stata accettata così che i pazienti potranno beneficiarne in Italia come negli USA: un diritto alla salute sinora negato è stato evaso.

MAURIZIO BONATI

- Milano

I DISTURBI DEL COMPORTAMENTO IN ETÀ EVOLUTIVA:

MODELLI DI INTERVENTO

Bergamo, 21 novembre 2019 - Centro Congressi Giovanni XXIII

9.00 Introduzione ai lavori
Gian Marco Marzocchi - *Università di Milano Bicocca*

9.15 Il contributo dell'Acceptance and Commitment Therapy all'intervento comportamentale con i genitori di bambini con disturbo del comportamento
Anna Prevedini - *IESCUM e ACT-Italia*

10.00 I disturbi di comportamento in classe: esperienze di teacher training
Fabio Celi - *Centro Studi Versilia e Università di Pisa*

10.45 - 11.15 Coffee Break

11.15 Seminario con discussione casi: Coping Power Program e protocolli Mindfulness: l'esperienza di "Al di là delle Nuvole"
Pietro Muratori & Lisa Polidori - *IRCCS Stella Maris di Calambrone, Pisa*

12.45 - 14.15 Pranzo

14.15 L'intervento sul disturbo da disregolazione dell'umore dirompente
Mario Di Pietro - *Istituto di Terapia Cognitiva e Comportamentale, Padova*

15.00 L'integrazione tra la psicoterapia e la farmacoterapia nei disturbi comportamentali in età evolutiva
Francesco Rovetto - *Università Pavia & Sigmund Freud University Milano*

15.45 Seminario con discussione casi: Disattiviamo il pilota automatico.
Un programma di intervento per bambini e adolescenti finalizzato a promuovere comportamenti consapevoli orientati ai valori personali
Laura Vanzin & Valentina Mauri - *IRCCS Medea di Bosisio Parini*

17.30 Conclusione e compilazione del questionario ECM
4.2 crediti ECM per le seguenti professioni: Neuropsichiatri, Psichiatri, Pediatri, Psicologi, Educatori Professionali, Assistenti Sociali, Logopedisti, Terapisti della Neuropsicomotricità

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(Delibera n. 406 - 2014 del 04/06/2014 Progetti NPI)
Il Progetto è realizzato con il contributo, parziale, della Regione Lombardia
(in attuazione della D.G. sanità n. 3798 del 08/05/2014, n. 778 del 05/02/2015, n. 5954 del 05/12/2016, N. 1077 del 02/02/2017 N. 1938 del 15/02/2019) Capofila Progetto: UONPIA Azienda Ospedaliera "Spedali Civili di Brescia"
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