NEWSLETTER

INDICE:

BIBLIOGRAFIA ADHD DICEMBRE 2014

Ann Neurol. 2014;76:758-64.

ABSENT CNKSR2 CAUSES SEIZURES AND INTELLECTUAL, ATTENTION, AND LANGUAGE DEFICITS.

Vaags AK, Bowdin S, Smith M-L, et al.

Synaptic function is central to brain function. Understanding the synapse is aided by studies of patients lacking individual synaptic proteins. Common neurological diseases are genetically complex. Their understanding is likewise simplified by studies of less common monogenic forms. We detail the disease caused by absence of the synaptic protein CNKSR2 in 8 patients ranging from 6 to 62 years old. The disease is characterized by intellectual disability, attention problems, and abrupt lifelong language loss following a brief early childhood epilepsy with continuous spike-waves in sleep. This study describes the phenotype of CNKSR2 deficiency and its involvement in systems underlying common neurological disorders.

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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.

Appl Neuropsychol Child. 2014 Dec;1-12.

CHARACTERISTICS OF EXECUTIVE FUNCTIONING IN A SMALL SAMPLE OF CHILDREN WITH TOURETTE SYNDROME.

Schwam DM, King TZ, Greenberg D.

Tourette syndrome (TS) is a disorder that involves at least one vocal tic and two or more motor tics; however, associated symptoms of obsessive-compulsive disorder (OCD) and attention-deficit disorder or attention-deficit hyperactivity disorder (ADHD) are common. Many children with TS exhibit educational difficulties and one possible explanation may be deficits in executive functioning. The focus of this study was to look at the severity of symptoms often associated with TS (tics and OCD and ADHD symptoms) and its potential relationship with the Behavior Rating Inventory of Executive Function (BRIEF) Parent Form in 11 children diagnosed with TS aged 8 to 14 years old. The parent of the child completed the BRIEF along with symptom measures evaluating tics, OCD behaviors, and ADHD symptoms. Despite relatively low mean scores on the symptom measures and just a few children exhibiting clinically significant scores on the BRIEF indexes, at least half the children exhibited abnormal scores on the Working Memory, Inhibit, and Shift subscales of the BRIEF. Varying patterns of relationships were found on the BRIEF subscales for each symptom severity scale. Results suggest that the BRIEF may be useful in determining the specific areas of difficulty in a population with variable symptomatology.

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Arch Dis Child. 2014 Dec.

PHYSICAL AND NEURODEVELOPMENTAL OUTCOMES IN CHILDREN WITH SINGLE-VENTRICLE CIRCULATION.

Davidson J, Gringras P, Fairhurst C, et al.

OBJECTIVE: To investigate longer-term physical and neurodevelopmental outcomes of patients with hypoplastic left heart syndrome (HLHS) compared with other patients with functionally single-ventricle circulation surviving beyond the age of 10 years.

DESIGN: A retrospective, observational study from a UK tertiary centre for paediatric cardiology.

RESULTS: 58 patients with HLHS and 44 non-HLHS patients with single-ventricle physiology were included. Subjective reduction in exercise tolerance was reported in 72% (95% CI 61% to 84%) of patients with HLHS and 45% (31% to 60%) non-HLHS patients. Compared with non-HLHS patients, educational concerns were reported more frequently in patients with HLHS, 41% (29% to 54%) vs 23% (10% to 35%), as was a diagnosis of a behaviour disorder (autism or attention deficit hyperactivity disorder) 12% (4% to 21%) vs 0%, and referral to other specialist services 67% (55% to 79%) vs 48% (33% to 63%).

CONCLUSIONS: Within a group of young people with complex congenital heart disease, those with HLHS are likely to have worse physical, psychological and educational outcomes.

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Arch Pediatr. 2014 Dec;21:1283-92.

ATTENTION-DEFICIT/HYPERACTIVITY DISORDER IN CHILDHOOD/ADOLESCENCE AND IMPAIRMENTS ASSOCIATED WITH DAILY LIFE: FRENCH DATA FROM THE EUROPEAN LIFETIME IMPAIRMENT SURVEY.

Caci H, Paille S.

Attention-deficit/hyperactivity disorder (ADHD) has a 3-5 % prevalence in Europe and North America. It is associated with functional impairment and can have a negative impact on social and family relationships and daily living. The experiences of children/adolescents with ADHD in Europe, as reported by parents/caregivers who completed the online Lifetime Impairment Survey (LIS), were evaluated. The LIS was conducted in France, Germany, Italy, Spain, the Netherlands, and the UK to assess the extent to which the daily lives of children/adolescents (aged<20 years) with ADHD are affected by their disorder as reported by parents/caregivers. Participants to the survey were recruited by email from the GfK Global Online Panel, which consisted of a database of 487,533 members (including 85,512 members in France). The control group comprised parents/caregivers of children/adolescents without ADHD. Treatment for ADHD, as perceived by parents/caregivers of children/adolescents with ADHD, was also reviewed. Data from France are described here. In France, 157 (79 with ADHD, 78 without ADHD) parents/caregivers completed the LIS. Median age at diagnosis was 6.0 years (mean [SD], 6.4 [3.18] years) as reported by parents/caregivers; pharmacological

treatment was prescribed for 46.8 % (37/79) of children/adolescents with ADHD. Compared with the control group, ADHD was associated with significantly greater impairment across all domains studied (P<0.001), except problems in home life. General impairment scale data demonstrated that more parents/caregivers of children/adolescents in the ADHD group than the control group thought that experiences during childhood/adolescence and unhappy memories would have a negative impact on their child in adult life (29-32 % vs 9-12 %, respectively). Issues that affected school/education were associated with perceived greater impairment in the ADHD group than the control group. Several limitations should be taken into account when reviewing these data, including the lack of questionnaire validation (although developed by expert consensus). In addition, the survey was conducted online and, as such, was more likely to recruit individuals who were well-educated, computer-literate, and willing to participate in the survey. Survey participants may also have had greater awareness of ADHD and the associated symptoms and impairment, and greater motivation to seek diagnosis or treatment, than the general population. Furthermore, diagnosis of ADHD and history of diagnosis were parent-/caregiver-reported and the results may have been influenced by recall bias or subjective reporting given that the survey did not directly assess the opinions of the children/adolescents with the disorder. These data provide insights into the negative impact that ADHD imposes on all aspects of life for children/adolescents in France with the disorder. Moreover, ADHD is believed to have a negative impact later in the patient's life. Further progress is needed in France and across Europe to provide a more effective and consistent approach to the treatment of patients with ADHD and to meet the expectations regarding management and treatment for the families concerned.

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Arq Neuro-Psiquiatr. 2014;72:856-61.

DIFFERENTIAL MOTOR ALTERATIONS IN CHILDREN WITH THREE TYPES OF ATTENTION DEFICIT HYPERACTIVITY DISORDER.

Poblano A, Luna B, Reynoso C.

Objective: To determine frequency of motor alterations in children with attention deficit hyperactivity disorder (ADHD).

Method: We evaluated 19 children aged 7-12 years with ADHD classified in three sub-types: Combined (ADHD-C), with Inattention (ADHD-I), and with Hyperactivity (ADHD-H). Controls were age- and gender matched healthy children. We utilized Bruininks-Oseretsky Test of Motor Proficiency (BOTMP) for measuring motor skills.

Results: We observed differences between children with ADHD and controls in BOTMP general score and in static coordination, dynamic general- and hand- coordination, and in synkinetic movements. We also found differences in dynamic hand coordination between controls and children with ADHD-C; in dynamic general coordination between controls and children with ADHD-H; and in frequency of synkinetic movements between controls and children with ADHD-H.

Conclusion: Children with ADHD with a major degree of hyperactivity showed greater frequency of motor alterations.

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Asia Pac Psychiatry. 2014 Dec;6:373-78.

BARRIERS TO SEEKING HELP AMONG CHILDREN WITH ATTENTION DEFICIT HYPERACTIVITY DISORDER IN TAIWAN.

Tzang RF, Chang YC, Chen CC.

BACKGROUND: This study explores barriers to seeking help for children with attention deficit hyperactivity disorder (ADHD) in Taiwan.

METHODS: The caregivers (mainly mothers) of 104 children with ADHD were evaluated on an outpatient basis. The mean age of the ADHD children was 9.47 +/- 1.97 years. Sociodemographic data and barriers related to seeking help were collected, including age, sex, multiple medical care seeking and parents' attitude toward the use of stimulants. The intensity of the barriers to seeking help was compared between good and/or poor compliance groups.

RESULTS: Those who took methylphenidate (MPH) regularly are less likely engage in multiple medical care seeking (P < 0.05) and are more likely to choose to seek help from a child psychiatrist as a first response to symptoms (P < 0.05). Boys with ADHD favored medical MPH treatment when seeking help. ADHD children of

mothers with a higher education were more likely to refuse psychiatric treatment in the initial stage and seek alternative treatment such as sensory integration training.
DISCUSSION: There is a need to clarify how the misdiagnosis of ADHD as sensory integration dysfunction may impede seeking effective mental health care. Policy makers should enhance the understanding of parents with children with ADHD to increase treatment effectiveness and adherence.

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Atten Defic Hyperact Disord. 2015 Jan.
METACOGNITIVE EXECUTIVE FUNCTION TRAINING FOR YOUNG CHILDREN WITH ADHD: A PROOF-OF-CONCEPT STUDY.
Tamm L, Nakonezny PA.
Executive functions (EF) are impaired in children with attention-deficit/hyperactivity disorder (ADHD). It may be especially critical for interventions to target EF in early childhood given the developmental progression of EF deficits that may contribute to later functional impairments. This proof-of-concept study examined the initial efficacy of an intervention program on EF and ADHD. We also examined child performance on three neurocognitive tasks assessing cognitive flexibility, auditory/visual attention, and sustained/selective attention. Children with ADHD (ages 3-7) and their parents were randomized to receive an intervention targeting metacognitive EF deficits (n = 13) or to a waitlist control condition (n = 12). Linear model analysis of covariance compared groups on parent EF ratings, blinded clinician ratings of ADHD symptoms and improvement, and child performance on neurocognitive measures. Children who received the intervention significantly improved on parent ratings of attention shifting and emotion regulation in addition to clinician ratings of inattention. Moderate effect sizes showed additional intervention effects on parent ratings of inhibition, memory, and planning, and clinician ratings of hyperactivity/impulsivity and overall improvement. Small effect sizes were observed for improvement on child neurocognitive measures. Although replication with a larger sample and an active control group is needed, EF training with a metacognitive focus is a potentially promising intervention for young children with ADHD.

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Biosciences Biotechnology Research Asia. 2014;11:761-66.
ALTERED RESTING-STATE FUNCTIONAL CONNECTIVITY PATTERNS OF SEVERAL FRONTAL AND DMN RELATED AREAS IN CHILDREN WITH ATTENTION DEFICIT HYPERACTIVITY DISORDER.
Shekarchi B, Lashkari MH, Mehrvar A, et al.
Attention Deficit Hyperactivity Disorder (ADHD) affects nearly 5% of school-aged children and generally it continues to adulthood. Neural basis of ADHD has been a matter of debate in recent decades. In this study a group independent component analysis based study has been done on 21 ADHD individuals and 21 control group. Spatial maps have been derived using dual regression method. Several differences have been found in frontal pole (specifically anterior cingulate cortex and inferior frontal gyrus). Posterior components of DMN, cerebellum and brainstem (pons) in the form of decreased activation compared to control group.

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BMC Psychiatry. 2012;12.
OPEN ACCESS THE IMPACT OF ADHD SYMPTOMS AND GLOBAL IMPAIRMENT IN CHILDHOOD ON WORKING DISABILITY IN MID-ADULTHOOD: A 28-YEAR FOLLOW-UP STUDY USING OFFICIAL DISABILITY PENSION RECORDS IN A HIGH-RISK IN-PATIENT POPULATION.
Mordre M, Groholt B, Sandstad B, et al.
Background: Individuals with ADHD have been associated with more employment difficulties in early adulthood than healthy community controls. To examine whether this association is attributable specifically to disturbance of activity and attention (ADHD) or to psychopathology in general, we wanted to extend existing research by comparing the rate of mid-adulthood working disabilities for individuals diagnosed with ADHD as children with the rate for clinical controls diagnosed with either conduct disorder, emotional disorder or mixed disorder of conduct and emotions.

Methods: Former Norwegian child-psychiatric in-patients (n=257) were followed up 17-39 years after hospitalization by record linkage to the Norwegian national registry of disability pension (DP) awards. Based on the hospital records, the patients were re-diagnosed according to ICD-10. Associations between the diagnoses, other baseline factors and subsequent DP were investigated using Kaplan-Meier survival analyses and logrank testing.
Results: At follow-up, 19% of the participants had received a DP award. In the logrank testing, ADHD was the only disorder associated with a subsequent DP, with 30% being disabled at follow-up (p = 0.01). Low psychosocial functioning (assessed by the Children's Global Assessment Scale) at admission uniquely predicted future DP (p = 0.04).
Conclusions: ADHD in childhood was highly associated with later receiving a DP. Our finding of worse prognosis in ADHD compared with other internalizing and externalizing disorders in mid-adulthood supports the assumption of ADHD being specifically linked to working disability. Assessment of psychosocial functioning in addition to diagnostic features could enhance prediction of children who are most at risk of future disability.

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BMC Psychiatry. 2013;13:286.

ATTENTION-DEFICIT/HYPERACTIVITY DISORDER AND IMPAIRMENT IN EXECUTIVE FUNCTIONS: A BARRIER TO WEIGHT LOSS IN INDIVIDUALS WITH OBESITY?

Cortese S, Comencini E, Vincenzi B, et al.

BACKGROUND: An increasing body of research points to a significant association of obesity to Attention-Deficit/Hyperactivity Disorder (ADHD) and deficits in executive functions. There is also preliminary evidence suggesting that children with ADHD may be at risk of obesity in adulthood.
DISCUSSION: In this article, we discuss the evidence showing that ADHD and/or deficits in executive functions are a barrier to a successful weight control in individuals enrolled in weight loss programs. Impairing symptoms of ADHD or deficits in executive functions may foster dysregulated eating behaviors, such as binge eating, emotionally-induced eating or eating in the absence of hunger, which, in turn, may contribute to unsuccessful weight loss. ADHD-related behaviors or neurocognitive impairment may also hamper a regular and structured physical activity. There is initial research showing that treatment of comorbid ADHD and executive functions training significantly improve the outcome of obesity in individuals with comorbid ADHD or impairment in executive functions.
SUMMARY: Preliminary evidence suggests that comorbid ADHD and deficits in executive functions are a barrier to a successful weight loss in individuals involved in obesity treatment programs. If further methodologically sound evidence confirms this relationship, screening and effectively managing comorbid ADHD and/or executive functions deficits in individuals with obesity might have the potential to reduce not only the burden of ADHD but also the obesity epidemics.

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BMC Psychiatry. 2014 Dec;14:1691.

DIFFERENTIATING ADHD FROM ORAL LANGUAGE DIFFICULTIES IN CHILDREN: ROLE OF MOVEMENTS AND EFFECTS OF STIMULANT MEDICATION.

Hughes CW, Pickering J, Baker K, et al.

Background The current study was designed to test if an objective measure of both attention and movement would differentiate children with Oral Language Disorders (OLD) from those with comorbid Attention Deficit/Hyperactivity Disorder (ADHD) and if stimulant medication improved performance when both disorders were present.
Methods The sample consisted of thirty-three children with an identified oral language disorder (of which 22 had comorbid ADHD) ages 6 to 13 who were enrolled in a yearlong intensive learning intervention program. Those on a stimulant medication were tested at baseline and again a year later on and off medication.
Results Objective measures that included an infrared motion analysis system which tracked and recorded subtle movements discriminated children with OLD from those with a comorbid ADHD disorder whereas classic

attention measures did not. There were better attention scores and fewer movements in children while on-medication.
Conclusions Use of an objective measurement that includes movement detection improves objective diagnostic differential for OLD and ADHD and provides quantifiable changes in performance related to medication for both OLD and ADHD.

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BMJ Open. 2014;4:e006838.
PROTOCOL INVESTIGATING THE CLINICAL UTILITY OF AN OBJECTIVE MEASURE OF ACTIVITY AND ATTENTION (QBTEST) ON DIAGNOSTIC AND TREATMENT DECISION-MAKING IN CHILDREN AND YOUNG PEOPLE WITH ADHD-'ASSESSING QBTEST UTILITY IN ADHD' (AQUA): A RANDOMISED CONTROLLED TRIAL.
Hall CL, Walker GM, Valentine AZ, et al.
INTRODUCTION: The National Institute for Health and Care Excellence (NICE) guidelines for attention deficit/hyperactivity disorder (ADHD) state that young people need to have access to the best evidence-based care to improve outcome. The current 'gold standard' ADHD diagnostic assessment combines clinical observation with subjective parent, teacher and self-reports. In routine practice, reports from multiple informants may be unavailable or contradictory, leading to diagnostic uncertainty and delay. The addition of objective tests of attention and activity may help reduce diagnostic uncertainty and delays in initiating treatment leading to improved outcomes. This trial investigates whether providing clinicians with an objective report of levels of attention, impulsivity and activity can lead to an earlier, and more accurate, clinical diagnosis and improved patient outcome.
METHODS AND ANALYSIS: This multisite randomised controlled trial will recruit young people (aged 6-17 years old) who have been referred for an ADHD diagnostic assessment at Child and Adolescent Mental Health Services (CAMHS) and Community Paediatric clinics across England. Routine clinical assessment will be augmented by the QbTest, incorporating a continuous performance test (CPT) and infrared motion tracking of activity. The participant will be randomised into one of two study arms: QbOpen (clinician has immediate access to a QbTest report): QbBlind (report is withheld until the study end). Primary outcomes are time to diagnosis and diagnostic accuracy. Secondary outcomes include clinician's diagnostic confidence and routine clinical outcome measures. Cost-effective analysis will be conducted, alongside a qualitative assessment of the feasibility and acceptability of incorporating QbTest in routine practice.
ETHICS AND DISSEMINATION: The findings from the study will inform commissioners, clinicians and managers about the feasibility, acceptability, clinical utility and cost-effectiveness of incorporating QbTest into routine diagnostic assessment of young people with ADHD. The results will be submitted for publication in peer-reviewed journals. The study has received ethical approval.
TRIAL REGISTRATION NUMBER: NCT02209116

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Can J Psychiatry. 2014;59:597-608.
TREATMENT PATTERNS, RESOURCE USE, AND ECONOMIC OUTCOMES ASSOCIATED WITH ATYPICAL ANTIPSYCHOTIC PRESCRIPTIONS IN CHILDREN AND ADOLESCENTS WITH ATTENTION-DEFICIT HYPERACTIVITY DISORDER IN QUEBEC.
Lachaine J, De G, Sikirica V, et al.
Objective: To assess treatment patterns, health care resource utilization (HRU), and costs among previously stimulant-treated children and adolescents with attention-deficit hyperactivity disorder (ADHD) receiving atypical antipsychotic (AAP) prescriptions in Quebec
Methods: Health care claims data extracted from Quebec's provincial health plan database between March 2007 and February 2012 were analyzed. Children and adolescents (6 to 17 years) with ADHD who were taking a stimulant and either switched to, or augmented with, an AAP (with the first AAP defined as the index AAP) without a documented diagnosis for which AAPs are Health Canada-approved were included. Discontinuation, augmentation, and switching of the index AAP during the 12-month, follow-up period were estimated using Kaplan-Meier survival analysis. HRU and costs for the 6 months before (baseline period) and after initiation of the index AAP were compared

Results: A total of 453 children and adolescents with ADHD, mostly male (74.6%) and aged 6 to 12 years (73.7%), met the inclusion criteria. The 12-month discontinuation, augmentation, and switching rates were 45.5%, 68.2%, and 80.7%, respectively. Patients had, on average, more all-cause prescription fills (22.2, compared with 13.3) and incurred more all-cause pharmacy ($889, compared with $710), total medical ($1096, compared with $644), and total health care ($1985, compared with $1354) costs during the 6-month study period than during the 6-month baseline period (all $P < 0.05$). Similarly, ADHD-related total health care costs were higher during the study period ($1269, compared with $835; $P < 0.05$); all-cause and ADHD-related total health care costs increased by 46.6% and 52.0%, respectively
Conclusion: Use of an AAP among stimulant-treated children and adolescents with ADHD in Quebec was associated with high rates of therapy changes and increased HRU and costs.

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Child Care Health Dev. 2015 Jan;41:139-46.

DEFINITIONS OF SLEEPLESSNESS IN CHILDREN WITH ATTENTION-DEFICIT HYPERACTIVITY DISORDER (ADHD): IMPLICATIONS FOR MOTHERS' MENTAL STATE, DAYTIME SLEEPINESS AND SLEEP-RELATED COGNITIONS.

Montgomery P, Wiggs L.

BACKGROUND: Sleep disturbances are common in children with attention-deficit hyperactivity disorder (ADHD). Sleeplessness is frequently reported although results are inconsistent perhaps because different definitions for it are applied. This study looked at maternal functioning and child objective sleep patterns in relation to different definitions of sleeplessness in children with ADHD.
METHODS: The study included 45 children (aged 3-14 years) with ADHD and their mothers. Sleeplessness was defined according to: (i) yes/no report of whether mothers thought their children had a problem with sleeplessness (Maternal definition MD) and (ii) mothers' responses to a quantitative standardized questionnaire (Quantitative definition QD) designed to detect the frequency and duration of parent-reported problems with settling, night waking and early waking. Objective sleep patterns were also assessed by means of actigraphy. Maternal mental health, daytime sleepiness and cognitions related to child sleep were assessed by questionnaire.
RESULTS: Both definitions appeared to tap similar although slightly different constructs. There were no group differences in objective sleep patterns. Maternal mental health was found to be significantly worse in the mothers who considered their child to be sleepless (MD) ($P < 0.025$), but not in those mothers whose child was found to be sleepless according to the standardized criteria (QD). Maternal sleepiness did not differ between groups. For both categories of sleepless children (MD and QD), the mothers had significantly more doubts about their competency as a parent ($P < 0.01$ and $P < 0.025$, respectively) compared to mothers of children without sleeplessness.
CONCLUSIONS: Two different maternal assessments of child sleeplessness in children with ADHD may assess subtly different constructs, but both may provide useful information about potential problems across the family.

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Child Neuropsychol. 2015;21:25-40.

EMOTION-RECOGNITION ABILITIES AND BEHAVIOR PROBLEM DIMENSIONS IN PRESCHOOLERS: EVIDENCE FOR A SPECIFIC ROLE FOR CHILDHOOD HYPERACTIVITY.

Chronaki G, Garner M, Hadwin JA, et al.

Facial emotion-recognition difficulties have been reported in school-aged children with behavior problems; little is known, however, about either this association in preschool children or with regard to vocal emotion recognition. The current study explored the association between facial and vocal emotion recognition and behavior problems in a sample of 3 to 6-year-old children. A sample of 57 children enriched for risk of behavior problems (41 were recruited from the general population while 16 had been referred for behavior problems to local clinics) were each presented with a series of vocal and facial stimuli expressing different emotions (i.e., angry, happy, and sad) of low and high intensity. Parents rated children's externalizing and internalizing behavior problems. Vocal and facial emotion recognition accuracy was negatively correlated with externalizing but not internalizing behavior problems independent of emotion type. The effects with the externalizing domain were independently

associated with hyperactivity rather than conduct problems. The results highlight the importance of using vocal as well as facial stimuli when studying the relationship between emotion-recognition and behavior problems. Future studies should test the hypothesis that difficulties in responding to adult instructions and commands seen in children with attention deficit/hyperactivity disorder (ADHD) may be due to deficits in the processing of vocal emotions.

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Child Neuropsychol. 2014.

EXPLORING THE DYNAMICS OF DESIGN FLUENCY IN CHILDREN WITH AND WITHOUT ADHD USING ARTIFICIAL NEURAL NETWORKS.

Gauthier B, Parent V, Lageix P.

The neuropsychology of attention deficit/hyperactivity disorder (ADHD) has been extensively studied, with a general focus on global performance measures of executive function. In this study, we compared how global (i.e., endpoint) versus process (i.e., dynamic) measures of performance may help characterize children with and without ADHD using a design fluency task as a case study. The secondary goal was to compare the sensitivity of standard versus connectionist statistical models to group differences in cognitive data. Thirty-four children diagnosed with ADHD and 37 children without ADHD aged 8null11 years old were tested on the Five-Point Test. The continuous process measure of performance, indexed as the number of produced designs at each consecutive 1 minute interval during 5 minutes, was analyzed against the discrete process measure, that is, the number of designs between first and last intervals and the standard global performance measure of total number of produced designs. Results show that the continuous process measure distinguished the two groups better than the two other measures. The detailed observation of production patterns revealed a decreasing linear trajectory in children without ADHD that contrasts with the flat, but fluctuating productivity pattern of children with ADHD. With regards to the second goal, results show that the connectionist and standard methods are equally sensitive to group differences for the three types of measures. This illustrates the utility of quantitative process measures together with the connectionist method in neuropsychological research and suggests great potential for a dynamical approach to cognition.

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Clin Psychol Rev. 2014 Dec;34:595-607.

THE CO-OCCURRENCE OF ATTENTION-DEFICIT/HYPERACTIVITY DISORDER AND UNIPOLAR DEPRESSION IN CHILDREN AND ADOLESCENTS: A META-ANALYTIC REVIEW.

Meinzer MC, Pettit JW, Viswesvaran C.

This paper reviews the empirical literature on the association between attention-deficit/hyperactivity disorder (ADHD) and depression (i.e., unipolar depressive disorders and symptoms) among children and adolescents. Findings from cross-sectional and longitudinal studies published on the co-occurrence of ADHD and depression were summarized and subjected to a meta-analysis. Results (k=29, N=8755; rbar=0.22) indicated that ADHD and depression were positively related, but substantial variability existed across the studies. Subgroup analyses indicated medium positive effects for cross-sectional studies, studies that operationalized ADHD based on DSM-III or DSM-IV diagnostic criteria, and studies that did not include teacher report in the assessment of ADHD. Subgroup analyses showed a large positive effect for studies that operationalized ADHD based on DSM-III-R criteria and studies using clinic referred samples. In contrast, subgroup analyses indicated a small negative and/or unreliable association between ADHD and depression for longitudinal studies, studies using DSM-II diagnostic criteria for hyperkinetic reaction of childhood or used a dichotomous motor hyperactivity criterion, studies that used nonreferred samples, and studies including teacher report in the assessment of ADHD. When studies that used DSM-II diagnostic criteria were removed, a reliable medium effect was found for studies that included teacher report. Similarly when the study that used idiosyncratic methods of diagnosing ADHD was excluded, a reliable medium effect was found for studies that used nonreferred samples. Potential explanations for the findings are discussed, including explanations based on sampling and base rates, artifacts of diagnostic

criteria, inaccurate diagnostic boundaries, and etiological relationships. Directions for future research and clinical implications are discussed.

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Clin Neuropharmacol. 2014;37:136-41.

ASSOCIATION OF SNAP-25, SLC6A2, AND LPHN3 WITH OROS METHYLPHENIDATE TREATMENT RESPONSE IN ATTENTION-DEFICIT/HYPERACTIVITY DISORDER.

Song J, Kim SW, Hong HJ, et al.

Objectives: Our study aimed to identify the association of norepinephrine transporter gene (SLC6A2), synaptosomal-associated protein of the 25-kDa gene (SNAP-25), and latrophilin 3 gene (LPHN3) with osmoticcontrolled release oral delivery system methylphenidate (OROS MPH) treatment response.

Methods: One hundred thirty-nine children and adolescents with attention-deficit/hyperactivity disorder (ADHD) were recruited. We selected rs192303, rs3785143 in SLC6A2; rs3746544 (1065 T>G) in SNAP-25; and rs6551665, rs1947274, and rs2345039 in LPHN3 to examine the association of OROSMPH treatment response with each single nucleotide polymorphism. We first defined good response group when the Korean version of the ADHD rating scale score at 8 weeks was decreased for more than 50% of baseline scores and compared genotype frequencies in good response group with poor group. Second, we defined it when the Clinical Global Impression-Improvement score at 8 weeks was 1 or 2, and we also analyzed the genotype frequencies.

Results: There was a significant association between the 1065 T>G of SNAP-25 gene and OROS MPH response, with the good response group defined by the Korean version of ADHD rating scale scores; 33.3% of the subjects with GG genotype showed a good response, whereas 74.7% of those with TT genotype and 72.5% of those with TG genotype showed good responses (P=0.034). SLC6A2 rs192303 was related with OROS MPH treatment response when we defined good treatment response by Clinical Global Impression-Improvement (P=0.009).

Conclusions: Our study suggested that SNAP-25 gene and SLC6A2 were involved with OROS MPH response.

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CNS Drugs. 2014 Dec;28:1191-203.

HEALTH-RELATED QUALITY OF LIFE AND FUNCTIONAL OUTCOMES FROM A RANDOMIZED-WITHDRAWAL STUDY OF LONG-TERM LISDEXAMFETAMINE DIMESYLATE TREATMENT IN CHILDREN AND ADOLESCENTS WITH ATTENTION-DEFICIT/HYPERACTIVITY DISORDER.

Banaschewski T, Johnson M, Lecendreux M, et al.

BACKGROUND: The stimulant prodrug lisdexamfetamine dimesylate (LDX) is an effective and generally well tolerated treatment for the symptoms of attention-deficit/hyperactivity disorder (ADHD). Positive impacts of LDX on health-related quality of life and functional impairment have previously been demonstrated in a 7-week, randomized, double-blind, placebo-controlled, phase III study in children and adolescents in Europe. Maintenance of these broad benefits, as well as symptomatic control, is a key goal of long-term management of ADHD.

OBJECTIVE: Secondary objectives of this multinational study in children and adolescents with ADHD were to assess the long-term maintenance of effectiveness of LDX in improving health-related quality of life and reducing functional impairment, as gauged using the Child Health and Illness Profile-Child Edition: Parent Report Form (CHIP-CE: PRF) and the Weiss Functional Impairment Rating Scale-Parent Report (WFIRS-P), respectively.

METHODS: Patients aged 6-17 years with diagnosed ADHD and a baseline ADHD Rating Scale IV total score of at least 28 were enrolled from the previous European study and from US sites. Patients who completed an open-label LDX treatment period of at least 26 weeks were randomized (1:1) to continue on their optimized dose of LDX or to switch to placebo for a 6-week, double-blind, withdrawal period. Parents completed CHIP-CE: PRF and WFIRS-P questionnaires at weeks 0, 8 and 26 of the open-label period and at weeks 0 and 6 of the randomized-withdrawal period, or at early termination. The endpoint of each period was defined as the last visit with valid data. Effect sizes were the difference (LDX minus placebo) in least-squares (LS)-mean change from baseline to endpoint divided by root-mean-square error. P values were nominal and not adjusted for multiple comparisons.

RESULTS: The open-label and randomized full analysis sets comprised 262 and 153 (LDX n = 76; placebo n = 77) patients, respectively. Mean pretreatment CHIP-CE: PRF T-scores were more than one standard deviation below the normative mean in four of the five domains, and there was significant improvement across all domains from baseline to endpoint of the open-label period. In the randomized-withdrawal period, LS-mean CHIP-CE: PRF T-scores deteriorated in all domains in the placebo group, but not in the LDX group. Compared with placebo, the effect of LDX was significant in the Risk Avoidance (effect size 0.829; $p < 0.001$), Achievement (0.696; $p < 0.001$) and Satisfaction (0.636; $p < 0.001$) domains. Mean pretreatment WFIRS-P scores were lowest in the Family domain and the Learning and School domain. WFIRS-P total score and scores in all domains improved significantly from baseline to endpoint of the open-label period. In the randomized-withdrawal period, LS-mean scores deteriorated in the placebo group but not in the LDX group. Compared with placebo, the effect of LDX was significant in the Family, Learning and School, and Risky Activities domains and in total (effect size 0.908; $p < 0.001$).
CONCLUSIONS: Using parent-rated instruments, long-term maintenance of the beneficial effect of LDX in multiple domains of health-related quality of life and functional impairment was demonstrated by comparison of treatment continuation and withdrawal under randomized, double-blind, placebo-controlled conditions.

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Cogn Behav Pract. 2014.

PARENT-CHILD INTERACTION THERAPY WITH EMOTION COACHING FOR PRESCHOOLERS WITH ATTENTION-DEFICIT/HYPERACTIVITY DISORDER.

Chronis-Tuscano A, Lewis-Morrarty E, Woods KE, et al.

Preschoolers with attention-deficit/hyperactivity disorder (ADHD) are at increased risk for the development of comorbid conduct disorder (CD) and depression. Early predictors of serious adverse outcomes within this population include parenting characterized by high levels of negativity and low levels of positivity, maternal depression, and child emotion regulation (ER) difficulties. Parent-child interaction therapy (PCIT) is an evidence-based treatment for oppositional defiant disorder and CD that has also been shown to improve comorbid child internalizing symptoms and maternal depression by enhancing parenting and improving the parent-child relationship. PCIT-emotion development (PCIT-ED) is an adaptation for depressed preschoolers, grounded in developmental literature, which teaches parents to become nullemotion coachesnull for their children, in an effort to build child ER skills. In this paper, we describe the iterative process by which we implemented and adapted PCIT-ED based on our experiences treating nine children with ADHD. We present three case examples that exemplify our process in adapting the PCIT-ED manual. This work suggests that PCIT with parent emotion coaching (PCIT-ECo) may be a promising treatment approach for young children with ADHD. Future research will need to examine this adaptation relative to standard PCIT to determine whether our integration of parent emotion coaching results in added improvement in child ER, internalizing and externalizing problems, and functional impairment.

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Community Ment Health J. 2014 Dec.

FACTORS INFLUENCING TIME LAG BETWEEN INITIAL PARENTAL CONCERN AND FIRST VISIT TO CHILD PSYCHIATRIC SERVICES AMONG ADHD CHILDREN IN JAPAN.

Yamauchi Y, Fujiwara T, Okuyama M.

The aim of this study was to examine the factors associated with a time lag between initial parental concern about ADHD symptoms and the first visit to a hospital in Japan that offers child psychiatric services. We investigated the demographic characteristic, symptoms, diagnosis, and healthcare system factors including duration between initial parental concern about symptoms and the first visit to a hospital (N = 387). The mean time lag between initial parental concern and the first visit to a hospital was 2.6 years. Risk factors for a longer time lag include the young age of a child, behavioral problems of the child, lower maternal education, difficulty in determining appropriate medical institution, referral route, and the distance from home to the hospital. A more

established connection between a hospital with child psychiatric services and other health institutions is recommended for earlier referral to an appropriate hospital.

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Compr Psychiatry. 2015 Jan;56:121-27.

THE RELATIONSHIP BETWEEN CHILDHOOD HISTORY OF ADHD SYMPTOMS AND DSM-IV BORDERLINE PERSONALITY DISORDER FEATURES AMONG PERSONALITY DISORDERED OUTPATIENTS: THE MODERATING ROLE OF GENDER AND THE MEDIATING ROLES OF EMOTION DYSREGULATION AND IMPULSIVITY.

Fossati A, Gratz KL, Borroni S, et al.

A number of studies have reported data suggestive of a significant association between attention-deficit/hyperactivity disorder (ADHD) and borderline personality disorder (BPD). However, the nature of this relation is not fully understood. This study aimed to evaluate if the relation between retrospectively assessed ADHD symptoms and adult BPD features is moderated by participants' gender and mediated by emotion dysregulation and impulsivity. Two hundred seventeen outpatients meeting DSM-IV criteria for at least one personality disorder (PD) consecutively admitted to the Clinical Psychology and Psychotherapy Unit of the Scientific Institute H San Raffaele of Milan, Italy, were administered Italian versions of the following instruments: Structured Clinical Interview for DSM-IV Axis II Personality Disorders (SCID-II), Wender Utah Rating Scale (WURS), Difficulties in Emotion Regulation Scale (DERS), and the Barratt Impulsiveness Scale-11 (BIS-11). Moderation analyses revealed a significant association between ADHD and BPD symptoms among only female (vs. male) outpatients. Furthermore, in the female subsample, mediation analyses revealed that both impulsivity and emotion dysregulation fully mediated the relationship between retrospectively assessed ADHD symptoms and current BPD features.

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Curr Psychiatry Rep. 2014 Dec;16:516.

DISTINGUISHING BIPOLAR DISORDER FROM OTHER PSYCHIATRIC DISORDERS IN CHILDREN.

Singh MK, Ketter T, Chang KD.

Pediatric onset bipolar disorder (BD) is a challenging diagnosis with potentially debilitating outcomes. This review aims to critically evaluate recently published literature relevant to the diagnosis of BD in youth, emphasizing interesting and important new findings characterizing pediatric BD and reporting updates in the diagnostic and statistical manual relevant to this disorder in youth. Challenges regarding the diagnosis of BD will be discussed, in addition to important distinctions with other childhood disorders, including other bipolar spectrum disorders; major depressive disorder; dysthymia; disruptive mood dysregulation disorder (DMDD); attention-deficit/hyperactivity disorder (ADHD) and other disruptive behavioral disorders; anxiety disorders, including post-traumatic stress disorder (PTSD); psychotic disorders; autism spectrum disorders; substance use disorders; and borderline personality disorder. The review concludes with a comment on past research limitations and future directions in the field.

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Diagn Interv Radiol. 2014 Dec.

FUNCTIONAL MRI COMPLIANCE IN CHILDREN WITH ATTENTION DEFICIT HYPERACTIVITY DISORDER.

Karakas S, Dogutepe DE, Ceylan AO, et al.

PURPOSE: We aimed to test the effect of prescan training and orientation in functional magnetic resonance imaging (fMRI) in children with attention deficit hyperactivity disorder (ADHD) and to investigate whether fMRI compliance was modified by state anxiety.

METHODS: Subjects included 77 males aged 6-12 years; there were 53 patients in the ADHD group and 24 participants in the healthy control group. Exclusion criteria included neurological and/or psychiatric comorbidities (other than ADHD), the use of psychoactive drugs, and an intelligence quotient outside the normal range. Children were individually subjected to prescan orientation and training. Data were acquired using a 1.5 Tesla scanner and an 8-channel head coil. Functional scans were performed using a standard neurocognitive task.

RESULTS: The neurocognitive task led to reliable fMRI maps. Compliance was not significantly different between ADHD and control groups based on success, failure, and repetition rates of fMRI. Compliance of ADHD patients with extreme levels of anxiety was also not significantly different.
CONCLUSION: The fMRI compliance of ADHD children is typically lower than that of healthy children. However, compliance can be increased to the level of age-matched healthy control children by addressing concerns about the technical and procedural aspects of fMRI, providing orientation programs, and performing on-task training. In patients thus trained, compliance does not change with the level of state anxiety suggesting that the anxiety hypothesis of fMRI compliance is not supported.

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Drug Des Devel Ther. 2014;8:2321-32.

PILOT PHASE II STUDY OF MAZINDOL IN CHILDREN WITH ATTENTION DEFICIT/HYPERACTIVITY DISORDER.

Konofal E, Zhao W, Laouenan C, et al.

OBJECTIVE: Mazindol has been proposed as a potential treatment of children with attention deficit/hyperactivity disorder (ADHD). The purpose of this pilot study was to assess its pharmacokinetics, short-term efficacy, and safety.
SUBJECTS AND METHODS: A total of 24 children (aged 9-12 years) with ADHD (according to the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, text-revision criteria) received a daily dose of 1 mg for 7 days and were followed for 3 additional weeks. Pharmacokinetic samples were collected after the first administration. ADHD symptoms were assessed using the ADHD Rating Scale (RS)-IV, Conners' Parent Rating Scale - Revised: Long (CPRS-R:L) at screening, baseline, and the end of the study. The Clinical Global Impression - Severity (CGI-S) scale was assessed at baseline, and the CGI - Improvement (CGI-I) scale was assessed at subsequent visits.
RESULTS: Twenty-one subjects (aged 10±1 years) were analyzed. Pharmacokinetic data were described by a one-compartment model with first-order absorption, elimination, and lag time. The typical apparent clearance and apparent volume of distribution were 27.9 L/h and 234 L, and increased with fat-free mass and age, respectively. The mean change in score in ADHD RS-IV after 1 week of mazindol was -24.1 ($P<0.0001$), greater than a 90% improvement from baseline. Reduction of CPRS-R:L and CGI-S scores were -52.1 ($P<0.0001$) and -2.5 ($P<0.01$), respectively. Adverse events were mild to moderate, decreased appetite and upper abdominal pain being the most common.
CONCLUSION: This preliminary study shows that mazindol might be an effective, well-tolerated, and long-acting (more than 8 hours) agent for the treatment of ADHD in children.

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Dusunen Adam. 2014;27:301-07.

TEST ANXIETY PREVALANCE AND RELATED VARIABLES IN THE STUDENTS WHO ARE GOING TO TAKE THE UNIVERSITY ENTRANCE EXAMINATION.

Kavakci O, Semiz M, Kartal A, et al.

Objective: Test anxiety is common among students and has adverse effects on their exam performance. This study firstly focused on finding the prevalence of test anxiety. The second aim was to identify the predictors of test anxiety and its related variables among students who are going to take the university entrance exam.
Method: Totally 436 students (girls=220, boys=216) who were randomly recruited from four different schools to represent all the students who will take the University Entrance Examination in Sivas city centre participated in the study. The students filled in the Socio-demographic Data Form sociodemographic form, Test Anxiety Inventory (TAI), Beck's Depression Inventory (BDI), State-Trait Anxiety Inventory (STAI), Liebowitz Social Anxiety Scale (LSAS), Wender Utah Rating Scale (WURS) and Adult ADHD Self-Report Scale (ASRS).
Results: Test anxiety was detected in the 48.0% of students (n=208). Additionally, exam anxiety was found in 40.3% of the males (n=87) and in 55.8% of the girls (n=121) and the difference between them was statistically significant ($p<0.001$). There was a statistically significant relation between test anxiety and WURS, ASRS, STAI-II (Trait anxiety), LSAS anxiety, BDI scores. The symptoms of depression, attention deficit hyperactivity disorder (ADHD), social anxiety avoidant behavior, and the state of taking additional courses were found as the

independence factors that affect the exam anxiety. A lifetime rate of suicide attempts were significantly more in those with exam anxiety. There was a relationship between test anxiety and the time spent for internet.
Conclusion: Approximately half of the students taking the university entrance exams feel a high level of test anxiety. It may be useful for the test anxiety prevention programs to include the screening and treatment of ADHD, depression and social anxiety.

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Environ Health Perspect. 2014 Dec;122:1336-42.
PYRETHROID PESTICIDE EXPOSURE AND PARENTAL REPORT OF LEARNING DISABILITY AND ATTENTION DEFICIT/HYPERACTIVITY DISORDER IN U.S. CHILDREN: NHANES 1999-2002.
Quiros-Alcala L, Mehta S, Eskenazi B.
BACKGROUND: Use of pyrethroid insecticides has increased dramatically over the past decade; however, data on their potential health effects, particularly on children, are limited.
OBJECTIVE: We examined the cross-sectional association between postnatal pyrethroid exposure and parental report of learning disability (LD) and attention deficit/hyperactivity disorder (ADHD) in children 6-15 years of age.
METHODS: Using logistic regression, we estimated associations of urinary metabolites of pyrethroid insecticides with parent-reported LD, ADHD, and both LD and ADHD in 1,659-1,680 children participating in the National Health and Nutrition Examination Survey (1999-2002).
RESULTS: The prevalence rates of parent-reported LD, ADHD, and both LD and ADHD were 12.7%, 10.0%, and 5.4%, respectively. Metabolite detection frequencies for 3-PBA [3-phenoxybenzoic acid], cis-DCCA [cis-(2,2-dichlorovinyl)-2,2-dimethylcyclopropane-1-carboxylic acid], and trans-DCCA [trans-(2,2-dichlorovinyl)-2,2-dimethylcyclopropane-1-carboxylic acid] were 77.1%, 35.6%, and 33.9%, respectively. The geometric mean 3-PBA concentration was 0.32 mug/L (median = 0.31 mug/L; interquartile rage = 0.10-0.89 mug/L). cis- and trans-DCCA 75th-percentile concentrations were 0.21 mug/L and 0.68 mug/L, respectively. Log10-transformed 3-PBA concentrations were associated with adjusted odds ratios (ORs) of 1.18 (95% CI: 0.92, 1.51) for parent-reported LD, 1.16 (95% CI: 0.85, 1.58) for ADHD, and 1.45 (95% CI: 0.92, 2.27) for both LD and ADHD. Adjusted ORs remained nonsignificant and decreased after controlling for creatinine and other environmental chemicals previously linked to altered neurodevelopment. Similarly, no significant associations were observed for cis- and trans-DCCA.
CONCLUSIONS: Postnatal pyrethroid exposure was not associated with parental report of LD and/or ADHD. Given the widespread and increasing use of pyrethroids, future research should evaluate exposures at current levels, particularly during critical windows of brain development.
CITATION: Quiros-Alcala L, Mehta S, Eskenazi B. 2014. Pyrethroid pesticide exposure and parental report of learning disability and attention deficit/hyperactivity disorder in U.S. Children: NHANES 1999-2002. Environ Health Perspect 122:1336-1342; http://dx.doi.org/10.1289/ehp.1308031.

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Epilepsy Behav. 2014;41:251-56.
REAPPRAISAL OF ABNORMAL EEG FINDINGS IN CHILDREN WITH ADHD: ON THE RELATIONSHIP BETWEEN ADHD AND EPILEPTIFORM DISCHARGES.
Kanazawa O.
Introduction: Attention-deficit hyperactivity disorder is suggested to be closely related to epilepsy. A recent large-scale study revealed that ADHD in children is often accompanied by epilepsy. In Japan, methylphenidate (MPH) as a sustained-action tablet and atomoxetine (ATX) became commercially available as medications for children recently. Since then, the number of prescriptions of both medicines has increased rapidly. Methylphenidate, as a psychostimulant, has been a source of concern because of the perceived lowered threshold for convulsions in children. Based on this background, reappraisal of EEG findings in children with ADHD is important in order to detect indications of potential comorbid epilepsy and to investigate the developmental mechanisms of the neurophysiological manifestations in patients with ADHD.
Material and method: EEG findings in children newly diagnosed with ADHD and their relationship with clinical findings were investigated. The author evaluated 208 patients with ADHD newly diagnosed between 2008 and

2013. Of these, there were 145 patients for whom EEG findings were obtained along with a clinical follow-up for at least three months. Patients with IQ. <. 70 were excluded in order to obtain a homogenous group of patients with ADHD. The male-to-female ratio was 130:15, and the age range was between 5. years, 9. months and 19. years, 9. months, with mean age of 11. years, 4. months.
Results: The results revealed that about half (48.3%) of the children with ADHD had abnormal EEG findings and that 22.1% of them had epileptiform discharges. Patients without comorbidity of autism spectrum disorder (ore homogenous group with ADHD) were especially likely to show abnormal EEG findings (51.0%) including epileptiform discharges (24.5%). Afebrile seizures, that is, epileptic seizures, occurred in a boy three days after commencement of administration with MPH as a sustained-action tablet. In four patients with a past history of epilepsy, neither relapse of EEG abnormality nor epileptic seizures were observed during the follow-up period.
Conclusion: There was to be a significantly close relationship between ADHD and epileptiform discharges. Therefore, in patients with ADHD, it is important to obtain more precise information about seizures and presence of epilepsy from the personal and family histories, as well as to undertake a thorough EEG examination.

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Epilepsy Behav. 2015 Jan;42:22-28.

PARENT-RATED EMOTIONAL-BEHAVIORAL AND EXECUTIVE FUNCTIONING IN CHILDHOOD EPILEPSY .

Kavanaugh BC, Scarborough VR, Salorio CF.

The present study examined clinical and demographic risk factors associated with parent-rated emotional-behavioral and executive functioning in children and adolescents with epilepsy. The medical records of 152 children and adolescents with epilepsy referred for neuropsychological evaluation were reviewed. Results indicated that the sample displayed significantly elevated symptoms across the emotional-behavioral and executive domains assessed. Executive functioning and behavioral symptoms had the highest rates of clinically elevated scores, with lowest rates of elevated scores in internalizing and externalizing emotional problems. Only 34% of those participants with clinically significant emotional-behavioral or executive functioning difficulties had a history of psychological or counseling services, highlighting the underserved mental health needs of this population. In regard to clinical factors, the majority of seizure-related variables were not associated with emotional-behavioral or executive functioning. However, the frequency of seizures (i.e., seizure status) was associated with behavioral regulation aspects of executive functioning, and the age at evaluation was associated with externalizing problems and behavioral symptoms. Family psychiatric history (with the exception of ADHD) was associated with all domains of executive and emotional-behavioral functioning. In summary, emotional-behavioral and executive functioning difficulties frequently co-occur with seizures in childhood epilepsy, with both seizure-related and demographic factors contributing to the presentation of such neurobehavioral comorbidities. The present findings provide treatment providers of childhood epilepsy with important information to assist in better identifying children and adolescents who may be at risk for neurobehavioral comorbidities and may benefit from intervention.

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Eur Neuropsychopharmacol. 2014 Dec;24:1861-72.

EFFICACY AND SAFETY OF EXTENDED-RELEASE GUANFACINE HYDROCHLORIDE IN CHILDREN AND ADOLESCENTS WITH ATTENTION-DEFICIT/HYPERACTIVITY DISORDER: A RANDOMIZED, CONTROLLED, PHASE III TRIAL.

Hervas A, Huss M, Johnson M, et al.

Guanfacine extended-release (GXR), a selective alpha2A-adrenergic agonist, is a non-stimulant treatment for attention-deficit/hyperactivity disorder (ADHD). This study assessed the efficacy (symptoms and function) and safety of dose-optimized GXR compared with placebo in children and adolescents with ADHD. An atomoxetine (ATX) arm was included to provide reference data against placebo. Patients (6-17 years) were randomized at baseline to dose-optimized GXR (0.05-0.12mg/kg/day - 6-12 years: 1-4mg/day; 13-17 years: 1-7mg/day), ATX (10-100mg/day) or placebo for 4 or 7 weeks. The primary efficacy measure was change from baseline in ADHD Rating Scale version IV (ADHD-RS-IV). Key secondary measures were Clinical Global Impression-Improvement (CGI-I) and the Weiss Functional Impairment Rating Scale-Parent Report (WFIRS-P; learning and school, and family domains). Safety assessments included treatment-emergent adverse events (TEAEs), electrocardiograms

and vital signs. A total of 272 (80.5%) patients from Europe, the USA and Canada completed the study. Significant differences were observed in least squares mean change from baseline in ADHD-RS-IV total score (placebo-adjusted differences) (GXR: [-8.9, p<0.001]; ATX: [-3.8, p<0.05]), the difference from placebo in the percentage of patients showing improvement (1 ['very much improved'] or 2 ['much improved']) for CGI-I (GXR: [23.7, p<0.001]; ATX: [12.1, p<0.05]), WFIRS-P learning and school domain (GXR: [-0.22, p<0.01]; ATX: [-0.16, p<0.05]) and WFIRS-P family domain (GXR: [-0.21, p<0.01]; ATX: [-0.09, p=0.242]). Most common TEAEs for GXR were somnolence, headache and fatigue; 70.1% of GXR subjects reported mild-to-moderate TEAEs. GXR was effective and well tolerated in children and adolescents with ADHD.

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Eur Child Adolesc Psychiatry. 2014.

COMBINED STIMULANT AND ANTIPSYCHOTIC TREATMENT IN ADOLESCENTS WITH ATTENTION-DEFICIT/HYPERACTIVITY DISORDER: A CROSS-SECTIONAL OBSERVATIONAL STRUCTURAL MRI STUDY.

Schweren LJS, Hartman CA, Zwiers MP, et al.

Meta-analyses suggest normalizing effects of methylphenidate on structural fronto-striatal abnormalities in patients with attention-deficit/hyperactivity disorder (ADHD). A subgroup of patients receives atypical antipsychotics concurrent with methylphenidate. Long-term safety and efficacy of combined treatment are unknown. The current study provides an initial investigation of structural brain correlates of combined methylphenidate and antipsychotic treatment in patients with ADHD. Structural magnetic resonance imaging was obtained in 31 patients who had received combined methylphenidate and antipsychotic treatment, 31 matched patients who had received methylphenidate but not antipsychotics, and 31 healthy controls (M age 16.7 years). We analyzed between-group effects in total cortical and subcortical volume, and in seven frontal cortical and eight subcortical-limbic volumes of interest, each involved in dopaminergic neurotransmission. Patients in the combined treatment group, but not those in the methylphenidate only group, showed a reduction in total cortical volume compared to healthy controls (Cohennulls d = 0.69, p < 0.004), which was apparent in most frontal volumes of interest. Further, the combined treatment group, but not the methylphenidate group, showed volume reduction in bilateral ventral diencephalon (Left Cohennulls d = 0.48, p < 0.04; Right Cohennulls d = 0.46, p < 0.05) and the left thalamus (Cohennulls d = 0.47, p < 0.04). These findings may indicate antipsychotic treatment counteracting the normalizing effects of methylphenidate on brain structure. However, it cannot be ruled out that pre-existing clinical differences between both patient groups may have resulted in anatomical differences at the time of scanning. The absence of an untreated ADHD group hinders unequivocal interpretation and implications of our findings.

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Eur Child Adolesc Psychiatry. 2014.

LONG-TERM COURSE OF ADHD SYMPTOMS FROM CHILDHOOD TO EARLY ADULTHOOD IN A COMMUNITY SAMPLE.

Dopfner M, Hautmann C, Gortz-Dorten A, et al.

Comparatively little information is available from population-based studies on subgroup trajectories of attention-deficit/hyperactivity disorder (ADHD) core symptoms of inattention and hyperactivity-impulsivity (particularly as defined by DSM-IV and ICD-10). Recent report of a subgroup with high and increasing inattention symptoms across development requires replication. To identify the different trajectory subgroups for inattention, hyperactivity-impulsivity and total symptoms of ADHD in children and adolescents aged 7null19 years. Eleven birth cohorts from 2,593 families with children and adolescents who had parent ratings for the outcome measures of inattention, hyperactivity-impulsivity or total symptoms were considered. Data were analysed using an accelerated longitudinal design and growth mixture modelling was applied to detect subgroups. For all three outcome measures, three trajectories with low (78.3null83.3 %), moderate (13.4null18.8 %) and high (2.8null3.2 %) symptom levels were detected. Course within these subgroups was largely comparable across outcome domains. In general, a decrease in symptoms with age was observed in all severity subgroups, although the developmental course was stable for the high subgroups of inattention and total symptoms. About 3 % of children in a community-based sample follow a course with a high level of ADHD symptoms. In this high trajectory group, hyperactivity-impulsivity symptoms decrease with age from 7 to 19 years, whilst inattention and

total symptoms are stable. There was no evidence for an increase in symptoms across childhood/adolescence in any of the severity groups.

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Eur Child Adolesc Psychiatry. 2014.

BEHAVIORAL EFFECTS OF NEUROFEEDBACK IN ADOLESCENTS WITH ADHD: A RANDOMIZED CONTROLLED TRIAL.

Bink M, van NC, Popma A, et al.

Neurofeedback has been proposed as a potentially effective intervention for reducing Attention Deficit Hyperactivity Disorder (ADHD) symptoms. However, it remains unclear whether neurofeedback is of additional value to treatment as usual (TAU) for adolescents with clinical ADHD symptoms. Using a multicenter parallel-randomized controlled trial design, adolescents with ADHD symptoms were randomized to receive either a combination of TAU and neurofeedback (NFB + TAU, n = 45) or TAU-only (n = 26). Randomization was computer generated and stratified for age group (ages 12 through 16, 16 through 20, 20 through 24). Neurofeedback treatment consisted of approximately 37 sessions of theta/sensorimotor rhythm (SMR)-training on the vertex (Cz). Primary behavioral outcome measures included the ADHD-rating scale, Youth Self Report, and Child Behavior Checklist all assessed pre- and post-intervention. Behavioral problems decreased equally for both groups with medium to large effect sizes, range of partial (eta)2 = 0.08null0.31, p < 0.05. Hence, the combination of NFB + TAU was not more effective than TAU-only on the behavioral outcome measures. In addition, reported adverse effects were similar for both groups. On behavioral outcome measures, the combination of neurofeedback and TAU was as effective as TAU-only for adolescents with ADHD symptoms. Considering the absence of additional behavioral effects in the current study, in combination with the limited knowledge of specific treatment effects, it is questionable whether theta/SMR neurofeedback for adolescents with ADHD and comorbid disorders in clinical practice should be used. Further research is warranted to investigate possible working mechanisms and (long-term) specific treatment effects of neurofeedback.

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Front Human Neurosci. 2014;8.

CHILDREN WITH LOW WORKING MEMORY AND CHILDREN WITH ADHD: SAME OR DIFFERENT?

Holmes J, Hilton KA, Place M, et al.

The purpose of this study was to compare working memory (WM), executive function, academic ability, and problem classroom behaviors in children aged 8null11 years who were either identified via routine screening as having low WM, or had been diagnosed with ADHD. Standardized assessments of WM, executive function and reading and mathematics were administered to 83 children with ADHD, 50 children with low WM and 50 typically developing children. Teachers rated problem behaviors on checklists measuring attention, hyperactivity/impulsivity, oppositional behavior, and difficulties associated with executive function in the classroom. The ADHD and low WM groups had highly similar WM and executive function profiles, but were distinguished in two key respects: children with ADHD had higher levels of rated and observed impulsive behavior, and children with low WM had slower response times. Possible mechanisms for these common and distinct deficits are discussed.

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Front Human Neurosci. 2014;8.

SLOW CORTICAL POTENTIAL NEUROFEEDBACK AND SELF-MANAGEMENT TRAINING IN OUTPATIENT CARE FOR CHILDREN WITH ADHD: STUDY PROTOCOL AND FIRST PRELIMINARY RESULTS OF A RANDOMIZED CONTROLLED TRIAL.

Christiansen H, Reh V, Schmidt MH, et al.

Background: Treatment for children with attention deficit/hyperactivity disorder (ADHD) today is predominantly pharmacological. While it is the most common treatment, it might not always be the most appropriate one. Moreover, long term effects remain unclear. Behavior therapy (BT) and non-pharmacological treatments such as neurofeedback (NF) are promising alternatives, though there are no routine outpatient care/effectiveness studies yet that have included children with medication or changes in medication

Methods/design: This paper presents the protocol of a randomized controlled trial to compare the effectiveness of a Slow Cortical Potential (SCP) NF protocol with self-management (SM) in a high frequent outpatient care setting.Both groups (NF/SM) receive a total of 30 high frequent therapy sessions. Additionally, 6 sessions are reserved for comorbid problems. The primary outcome measure is the reduction of ADHD core symptoms according to parent and teacher ratings
Preliminary Results: Untill now 58 children were included in the study (48 males), with a mean age of 8.42 (1.34) years, and a mean IQ of 110 (13.37).Conners-3 parent and teacher ratings were used to estimate core symptom change. Since the study is still ongoing, and children are in different study stages, pre-post and follow-up results are not yet available for all children included. Preliminary results suggest overall good pre-post effects, though. For parent and teacher ratings an ANOVA with repeated measures yielded overall satisfying pre-post effects ((eta) 2 0.175null0.513). Differences between groups (NF vs.SM) could not yet be established (p = 0.81)
Discussion: This is the first randomized controlled trial to test the effectiveness of a NF protocol in a high frequent outpatient care setting that does not exclude children on or with changes in medication. First preliminary results show positive effects. The rationale for the trial, the design, and the strengths and limitations of the study are discussed.
Trial registration: This trial is registered in www.clinicaltrials.gov as NCT01879644.

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Int J Hyg Environ Health. 2015 Jan;218:153-62.
THE INFLUENCE OF LOW LEVEL PRE- AND PERINATAL EXPOSURE TO PCDD/FS, PCBS, AND LEAD ON ATTENTION PERFORMANCE AND ATTENTION-RELATED BEHAVIOR AMONG GERMAN SCHOOL-AGED CHILDREN: RESULTS FROM THE DUISBURG BIRTH COHORT STUDY.
Neugebauer J, Wittsiepe J, Kasper-Sonnenberg M, et al.
BACKGROUND: Prenatal exposure to polychlorinated biphenyls (PCBs) and lead are thought to be risk factors for attention-deficit hyperactivity disorder (ADHD), whereas the prenatal influence of polychlorinated dibenzo-p-dioxins and -furans (PCDD/Fs) on attention performance has been less studied.
OBJECTIVES: Within the Duisburg Birth Cohort Study, we investigated low-level exposure to these compounds in relation to children's attention.
METHODS: We measured blood levels of PCDD/Fs, PCBs and lead from pregnant mothers (32(nd) week of pregnancy) and PCDD/Fs and PCBs in breast milk (2 weeks after delivery). The attention of school-aged children (N=117) was investigated with a computer-based test battery of attention performance (KITAP) and a parent rating questionnaire of behaviors related to ADHD (FBB-ADHS). Influences of the exposure on attention were analyzed by multiple regression analyses.
RESULTS: Increasing prenatal PCDD/F and PCB concentrations were significantly ($p<0.05$) associated with a higher number of omission errors in the subtest Divided Attention (47% and 42%; 95% confidence intervals (95%-CI): 1.08-2.00 and 1.07-1.89, respectively). Prenatal lead concentrations had few significant associations with attention performance (e.g., a 23% higher number of omission errors in the subtest Distractibility; 95%-CI: 1.00-1.51), whereas ADHD-related behavior (questionnaire based) was increased with increasing lead exposure (Overall-ADHD: 9%; 95%-CI: 1.01-1.17). ADHD-related behavior was negatively associated with prenatal PCDD/F or PCB exposures (e.g., for PCB exposure: -10%; 95%-CI: 0.82-0.99).
CONCLUSIONS: Pre- and perinatal PCDD/F and PCB exposure may have subtle influences on attention performance in healthy children at low environmental levels, while behavior changes are negatively associated. Furthermore, we provide additional evidence for the impact of prenatal lead exposure on attention deficits.

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Int J Psychiatry Clin Pract. 2014 Dec;1-10.

STRESS LEVELS EXPERIENCED BY PARENTS OF CHILDREN WITH AND WITHOUT ATTENTION-DEFICIT/HYPERACTIVITY DISORDER DURING THE BACK-TO-SCHOOL PERIOD: RESULTS OF A EUROPEAN AND CANADIAN SURVEY.

Hernandez-Otero I, Doddamani L, Dutray B, et al.

Objective. The back-to-school stress survey was designed to compare stress in parents of children/ adolescents with/without attention-deficit/hyperactivity disorder (ADHD) in six European countries and Canada when children prepare to return to school.

Methods. Parents of children/adolescents (6-17 years) with/without ADHD were recruited and interviewed by a consumer research organization. Parents rated potentially stress-causing situations (both standard and specifically related to the return to school) on a scale from 1 (low stress) to 10 (high stress). Mean scores were compared using Student's t-test.

Results. In Europe, 613/693 (mean [SD] age: 40.7 [7.0]/40.1 [6.9] years) and in Canada, 102/150 (mean [SD] age: 44.4 [8.1]/44.1 [7.2] years) parents of children with/without ADHD, respectively, participated in the survey. Children with ADHD (mean [SD] age: 11.2 [3.2]/12.6 [3.2] years in Europe/Canada) had generally similar characteristics in both samples. Parents in the ADHD group showed higher stress levels than parents in the non-ADHD group in all situations ($p < 0.001$ for Europe). The return to school was considered one of the most stressful events during the year.

Conclusions. In Europe and Canada, ADHD has a significant impact on parental stress, particularly during the back-to-school period. This can have important implications as parental stress can affect presentation of ADHD symptoms.

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J Am Acad Child Adolesc Psychiatry. 2015 Jan;54:53-61.

THE IMPACT OF CASE DEFINITION ON ATTENTION-DEFICIT/HYPERACTIVITY DISORDER PREVALENCE ESTIMATES IN COMMUNITY-BASED SAMPLES OF SCHOOL-AGED CHILDREN.

McKeown RE, Holbrook JR, Danielson ML, et al.

OBJECTIVE: To determine the impact of varying attention-deficit/hyperactivity disorder (ADHD) diagnostic criteria, including new DSM-5 criteria, on prevalence estimates.

METHOD: Parent and teacher reports identified high- and low-screen children with ADHD from elementary schools in 2 states that produced a diverse overall sample. The parent interview stage included the Diagnostic Interview Schedule for Children-IV (DISC-IV), and up to 4 additional follow-up interviews. Weighted prevalence estimates, accounting for complex sampling, quantified the impact of varying ADHD criteria using baseline and the final follow-up interview data.

RESULTS: At baseline 1,060 caregivers were interviewed; 656 had at least 1 follow-up interview. Teachers and parents reported 6 or more ADHD symptoms for 20.5% (95% CI = 18.1%-23.2%) and 29.8% (CI = 24.5%-35.6%) of children respectively, with criteria for impairment and onset by age 7 years (DSM-IV) reducing these proportions to 16.3% (CI = 14.7%-18.0%) and 17.5% (CI = 13.3%-22.8%); requiring at least 4 teacher-reported symptoms reduced the parent-reported prevalence to 8.9% (CI = 7.4%-10.6%). Revising age of onset to 12 years per DSM-5 increased the 8.9% estimate to 11.3% (CI = 9.5%-13.3%), with a similar increase seen at follow-up: 8.2% with age 7 onset (CI = 5.9%-11.2%) versus 13.0% (CI = 7.6%-21.4%) with onset by age 12. Reducing the number of symptoms required for those aged 17 and older increased the overall estimate to 13.1% (CI = 7.7%-21.5%).

CONCLUSION: These findings quantify the impact on prevalence estimates of varying case definition criteria for ADHD. Further research of impairment ratings and data from multiple informants is required to better inform clinicians conducting diagnostic assessments. DSM-5 changes in age of onset and number of symptoms required for older adolescents appear to increase prevalence estimates, although the full impact is uncertain due to the age of our sample.

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J Am Acad Child Adolesc Psychiatry. 2015 Jan;54:62-70.

TREATMENT OF CHILDREN WITH ATTENTION-DEFICIT/HYPERACTIVITY DISORDER (ADHD) AND IRRITABILITY: RESULTS FROM THE MULTIMODAL TREATMENT STUDY OF CHILDREN WITH ADHD (MTA).

Fernandez dlC, Simonoff E, McGough JJ, et al.

OBJECTIVE: Clinically impairing irritability affects 25% to 45% of children with attention-deficit/hyperactivity disorder (ADHD); yet, we know little about what interventions are effective in treating children with ADHD and co-occurring irritability. We used data from the Multimodal Treatment Study of Children With ADHD (MTA) to address 3 aims: to establish whether irritability in children with ADHD can be distinguished from other symptoms of oppositional defiant disorder (ODD); to examine whether ADHD treatment is effective in treating irritability; and to examine how irritability influences ADHD treatment outcomes.

METHOD: Secondary analyses of data from the MTA included multivariate analyses, and intent-to-treat random-effects regression models were used.

RESULTS: Irritability was separable from other ODD symptoms. For treating irritability, systematic stimulant treatment was superior to behavioral management but not to routine community care; a combination of stimulants and behavioral treatment was superior to community care and to behavioral treatment alone, but not to medication alone. Irritability did not moderate the impact of treatment on parent- and teacher-reported ADHD symptoms in any of the 4 treatment groups.

CONCLUSION: Treatments targeting ADHD symptoms are helpful for improving irritability in children with ADHD. Moreover, irritability does not appear to influence the response to treatment of ADHD.

CLINICAL TRIAL REGISTRATION INFORMATION: Multimodal Treatment Study of Children With Attention Deficit and Hyperactivity Disorder (MTA); http://www.clinicaltrials.gov; NCT00000388.

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J Atten Disord. 2014 Dec.

FUNCTIONAL IMPAIRMENT VARIABILITY IN CHILDREN WITH ADHD DUE TO EMOTIONAL IMPULSIVITY.

Walerius DM, Reyes RA, Rosen PJ, et al.

OBJECTIVE: The present study utilized ecological momentary assessment (EMA) to examine the effects of emotional impulsivity on overall functional impairment and functional impairment variability (FIV) of children with and without ADHD.

METHOD: Parents of 74 children, 8- to 12-year-olds (42 with ADHD, 32 without ADHD), completed EMA assessment protocol ratings of their child's mood (3 times daily) and functional impairment (1 time daily) over the course of 28 days.

RESULTS: Hierarchical regression analyses supported the interaction of ADHD diagnostic status and greater EMA-derived emotional impulsivity in the estimation of total functional impairment (Total FI) and FIV. Thus, greater emotional impulsivity was found to be related to greater Total FI and FIV among children with ADHD but not among children without ADHD.

CONCLUSION: This study suggests that children with ADHD and greater emotional impulsivity demonstrate greater overall levels of functional impairment, with the severity of their impairment varying significantly over time.

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J Atten Disord. 2014 Dec.

COMPARISONS OF INTELLIGENCE AND BEHAVIOR IN CHILDREN WITH FETAL ALCOHOL SPECTRUM DISORDER AND ADHD.

Raldiris TL, Bowers TG, Towsey C.

OBJECTIVE: Children with fetal alcohol spectrum disorder (FASD) can easily be misdiagnosed as having ADHD.

METHOD: A total of 164 children were compared on cognitive and behavioral measures for four groups of children: FASD, ADHD, FASD + ADHD, and other neuropsychological disorders.

RESULTS: The ADHD group was not significantly different from the "other diagnosis" group on any of the measurements. The children with FASD were found to perform significantly worse than ADHD on externalizing

problems, Full-Scale IQ, and indices of Verbal Comprehension, Perceptual Reasoning, and Working Memory. The comorbid FASD + ADHD group was significantly weaker than ADHD on verbal comprehension measures. The FASD children demonstrated significantly higher levels of atypicality and aggression relative to ADHD, and the FASD + ADHD group demonstrated significantly higher levels of hyperactivity and withdrawal relative to ADHD.
CONCLUSION: These results indicate that children with FASD display a differential behavioral and cognitive profile that is significantly poorer than children with ADHD and other types of neuropsychological disorders.

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J Atten Disord. 2014 Dec.
SCREENING FOR THE ADHD PHENOTYPE USING THE STRENGTHS AND DIFFICULTIES QUESTIONNAIRE IN A CLINICAL SAMPLE OF NEWLY REFERRED CHILDREN AND ADOLESCENTS.
Carballo JJ, Rodriguez-Blanco L, Garcia-Nieto R, et al.
OBJECTIVE: To examine the screening ability of the Strengths and Difficulties Questionnaire (SDQ) for ADHD subtypes in a clinical sample.
METHOD: Parents of 523 children (3 to 17 years old) referred to Child and Adolescent Mental Health Services completed the Spanish version of the SDQ and the ADHD Rating Scale-IV. Receiver operating curve (ROC) curve analyses and likelihood ratios (LRs) were conducted.
RESULTS: The LR results indicated that the 8/10 cutoff showed the highest diagnostic accuracy. The sensitivity of the SDQ 8/10 cutoff for the three subtypes was significantly different: 84.0% (95% confidence interval [CI] = [75.58, 89.90]) of ADHD combined subtype (ADHD-Co), 25.0% (95% CI = [17.55, 34.30]) of ADHD predominantly inattentive subtype (ADHD-I), and 77.8% (95% CI = [68.71, 84.83]) of ADHD predominantly hyperactive/impulsive subtype (ADHD-H). Sex and age differences were found. These screening differences were also found when using the 7/10 cutoff or the SDQ predictive algorithm.
CONCLUSION: Our study supports the use of the SDQ in the screening for ADHD. However, not all ADHD subtypes are equally screened.

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J Atten Disord. 2014 Dec.
SOCIAL COMMUNICATION IS PREDICTED BY INHIBITORY ABILITY AND ADHD TRAITS IN PRESCHOOL-AGED CHILDREN: A MEDIATION MODEL.
Rints A, McAuley T, Nilsen ES.
OBJECTIVE: Given the role inhibitory control plays in both ADHD and communication, this study examined whether inattentive and hyperactive-impulsive traits mediate the impact of weak inhibitory ability upon the knowledge and application of pragmatic rules early in development.
METHOD: Participants were 36 typically developing preschoolers and their caregivers. ADHD traits were assessed per caregiver report. Inhibition was assessed in children using a distraction task. Pragmatic language was assessed by asking children about hypothetical social situations (knowledge) and by asking caregivers to report on children's actual communicative behaviors (application).
RESULTS: Individual differences in inhibition predicted both facets of pragmatic language development. Hyperactive-impulsive behaviors were a significant mediator of this relationship-but only with regard to children's ability to effectively apply pragmatic rules in everyday life.
CONCLUSION: Our findings suggest that social communication difficulties in some young children are a downstream consequence of hyperactive-impulsive behaviors that arise from poorly developed inhibitory control.

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J Atten Disord. 2014 Dec.

MATERNAL ADHD SYMPTOMS, PERSONALITY, AND PARENTING STRESS: DIFFERENCES BETWEEN MOTHERS OF CHILDREN WITH ADHD AND MOTHERS OF COMPARISON CHILDREN.

Perez AG, Kragh CA, Arnold LE, et al.

OBJECTIVE: Mothers raising a child with ADHD can experience high parenting stress. We evaluated if mothers' personality traits and own ADHD symptoms could also affect parenting stress.

METHOD: 430 biological mothers from the Multimodal Treatment Study of Children with ADHD (MTA mothers) and 237 of a local normative comparison group (LNCG mothers) were evaluated at baseline. Interactions were tested between mothers' group and maternal personality/ADHD symptoms related to parenting stress.

RESULTS: Compared to LNCG, MTA mothers had higher parenting stress, self-reported ADHD, neuroticism, and lower conscientiousness and agreeableness. When personality and ADHD were evaluated together, ADHD symptoms interacted with mothers' group: high maternal ADHD was positively associated with parenting stress for LNCG but not MTA mothers.

CONCLUSION: Personality traits or ADHD characteristics do not appear operative for the high parenting stress of mothers of a child with ADHD. However, high maternal ADHD or low conscientiousness are associated with stress levels similar to raising a child with ADHD.

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J Atten Disord. 2014 Dec.

PREVALENCE OF ANXIETY DISORDERS IN HONG KONG CHINESE CHILDREN WITH ADHD.

Shea CK, Lee MM, Lai KY, et al.

OBJECTIVE: This study examined the prevalence and correlates of anxiety disorders in Chinese children with ADHD.

METHOD: Overall, 120 children with ADHD aged 6 to 12 years were recruited, and the parent version of computerized Diagnostic Interview Schedule for Children-Version 4 was administrated to their primary caretakers.

RESULTS: The prevalence rate of anxiety disorders was 27.5%, which is consistent with the reports of previous Asian and Western studies. Among the children with ADHD and anxiety disorders, more than 50% of them also had comorbid oppositional defiant disorder or conduct disorder (ODD/CD), which yielded an adjusted odds ratio of 3.0 in multivariable analysis for anxiety disorder, with comorbid ODD/CD. In addition, anxiety disorders were positively associated with inattention symptoms in children with both disorders.

CONCLUSION: Clinicians should perform screening and careful assessment for anxiety symptoms in children with ADHD, particularly those suffering from comorbid ODD/CD.

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J Atten Disord. 2014 Dec.

TEMPERAMENT AND CHARACTER TRAITS OF PARENTS OF CHILDREN WITH ADHD.

Yurumez E, Yazici E, Gumus YY, et al.

OBJECTIVE: This study investigates the relationship between ADHD and the personalities of parents of children with ADHD.

METHOD: Personality traits of parents of children with ADHD (study group; n = 135) and parents of children without ADHD (control group; n = 122) were compared. Psychiatric comorbidities were excluded with Structured Clinical Interview for DSM-IV Axis I Disorders, Clinical Version [SCID-I-CV]. Personality is assessed with Temperament and Character Inventory, and inattention (IA) and hyperactivity (HI) are assessed with Turgay Scale.

RESULTS: Harm avoidance and persistence scores were higher, and self-directedness (SD) scores were lower in the study group than the control group. Being in ADHD group predicted lower SD scores. Positive correlations were found between harm avoidance and IA and HI, and between persistence and HI. Negative correlations were found between SD and both IA and HI.

CONCLUSION: Our data suggest that there is relationship between ADHD in children's and parents' personalities. Common etiologic properties and personalized psychoeducation and treatment options for families should be discussed

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J Atten Disord. 2014 Dec.

PEER REJECTION AND PERCEIVED QUALITY OF RELATIONS WITH SCHOOLMATES AMONG CHILDREN WITH ADHD.

Grygiel P, Humenny G, Rebisz S, et al.

OBJECTIVE: The main aim of the current study was to investigate the links between ADHD diagnosis and the objective and subjective dimensions of social relationships among children from primary schools.

METHOD: We used the data from 36 regular classrooms, consisting of 718 students, with each containing at least one child with an established clinical diagnosis of ADHD (38 children).

RESULTS: For children with ADHD, the level of the perceived quality of social relations was lower than that of children without such a diagnosis. After controlling for sociometric status, the impact of ADHD on perceived status proved to be statistically nonsignificant but the indirect impact of ADHD on this status through sociometric status was statistically significant.

CONCLUSION: Children diagnosed with ADHD are more often rejected by their peers and have a more pessimistic view of their social world. Moreover, ADHD diagnosis does not have a direct influence on the perceived quality of social relations otherwise than through sociometric status

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J Atten Disord. 2014 Dec.

LONG-TERM EFFICACY OF METHYLPHENIDATE IMMEDIATE-RELEASE FOR THE TREATMENT OF CHILDHOOD ADHD: A SYSTEMATIC REVIEW AND META-ANALYSIS.

Maia CR, Cortese S, Caye A, et al.

OBJECTIVE: To evaluate the long-term effects of methylphenidate imediate-release (MPH-IR), and to confirm the efficacy established in previous meta-analyses of short-term studies.

METHOD: Published and unpublished studies in which participants were treated with MPH-IR for 12 weeks or more were searched. Pooled effect sizes from these studies were computed with the DerSimonian and Laird random-effect model. Meta-regression analysis was conducted to estimate covariates associated with treatment effects.

RESULTS: Seven studies were included. Pooled parents ratings for inattention and hyperactivity/impulsivity resulted in standardized mean difference (SMD) = 0.96 (95% confidence interval [CI] = [0.60, 1.32]) and SMD = 1.12 (95% CI = [0.85, 1.39]), respectively; pooled teachers ratings showed SMD = 0.98 (95% CI = [0.09, 1.86]) for inattention and SMD = 1.25 (95% CI = [0.7, 1.81]) for hyperactivity/impulsivity. No evidence of association of any covariates with treatment effect was detected in the meta-regression.

CONCLUSION: MPH-IR is efficacious for childhood ADHD for periods longer than 12 weeks.

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J Atten Disord. 2014 Dec.

REGIONAL VOLUMETRIC DIFFERENCES BASED ON STRUCTURAL MRI IN CHILDREN WITH TWO SUBTYPES OF ADHD AND CONTROLS.

Semrud-Clikeman M, Fine JG, Bledsoe J, et al.

OBJECTIVE: The purpose of this study was to compare groups of children with two subtypes of ADHD and controls on selected regions using volumetric magnetic resonance imaging (MRI) measures. Children with ADHD were expected to have smaller volumes of the anterior cingulate cortex (ACC) and caudate. Parent behavioral rating measures of hyperactivity were predicted to relate to the volume of the caudate and attention with the ACC.

METHOD: There were a total of 74 children in the final sample (27 controls, 25 ADHD:Combined type [ADHD:C], 22 ADHD:Inattentive type [ADHD:I]).

RESULTS: Findings indicated that the ADHD:C group had bilaterally smaller volumes of the caudate and ACC compared with the other two groups. In addition, parent ratings of attention and hyperactivity significantly predicted the right volume of the ACC, whereas hyperactivity ratings predicted the volume of the right caudate. Analysis of the ADHD groups without the control confirmed these findings.
CONCLUSION: These findings indicate that different structures are related to the ADHD subtypes and suggest that they may be different phenotypes.

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J Atten Disord. 2015 Jan;19:72-77.

IS THERE A LINK BETWEEN MOTOR PERFORMANCE VARIABILITY AND SOCIAL-COMMUNICATIVE IMPAIRMENT IN CHILDREN WITH ADHD-CT: A KINEMATIC STUDY USING AN UPPER LIMB FITTS' AIMING TASK.

Papadopoulos N, Rinehart NJ, Bradshaw JL, et al.

OBJECTIVE: This study investigated the relationship between motor performance and social-communicative impairment in children with ADHD-combined type (ADHD-CT).
METHOD: An upper limb Fitts' aiming task was used as a measure of motor performance and the Social Responsiveness Scale as a measure of social-communicative/autistic impairment in the following groups: ADHD-CT (n = 11) and typically developing (TD) controls (n = 10).
RESULTS: Children with ADHD-CT displayed greater variability in their movements, reflected in increased error variance over repeated aiming trials compared with TD controls. Motor performance variability was associated with social-communicative deficits in the ADHD-CT but not in the TD group.
CONCLUSION: Social-communicative impairments further complicate the clinical picture of ADHD-CT; therefore, further research in this area is warranted to ascertain whether a particular pattern of motor disturbance in children with ADHD-CT may be clinically useful in identifying and assessing children with a more complex ADHD presentation.

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J Atten Disord. 2015 Jan;19:11-17.

ADHD AND MENTAL HEALTH STATUS IN BRAZILIAN SCHOOL-AGE CHILDREN.

Arruda MA, Querido CN, Bigal ME, et al.

OBJECTIVE: To assess the prevalence of ADHD, mental health status, and risk factors in a sample of Brazilian children.
METHOD: Target sample consisted of all children from 5 to 13 years registered in the public elementary school. Children with ADHD were compared with those without ADHD for sociodemographic, risk factors, and Child Behavior Checklist (CBCL) symptom dimensions. Multivariate models estimated determinants of ADHD diagnosis.
RESULTS: Of the target sample, consents and complete information were obtained from 1,830 children (91.8%). The prevalence rate of ADHD was 5.1% (95% confidence interval [CI] = [4.2, 6.2]). In contrast to controls, children with ADHD presented higher levels of symptoms in the CBCL dimensions. In multivariate analyses, the diagnosis of ADHD was significantly influenced by maternal educational status (p = .019), income class (p = .012), and prenatal exposure to tobacco (p = .032).
CONCLUSION: Prevalence and demographic features of ADHD in Brazil are similar to what has been reported worldwide.

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J Atten Disord. 2015 Jan;19:63-71.

DO ADHD CHILDREN WITH AND WITHOUT CHILD BEHAVIOR CHECKLIST-DYSREGULATION PROFILE HAVE DIFFERENT CLINICAL CHARACTERISTICS, COGNITIVE FEATURES, AND TREATMENT OUTCOMES?

Peyre H, Speranza M, Cortese S, et al.

OBJECTIVE: The Child Behavior Checklist-Dysregulation Profile (CBCL-DP), characterized by elevated scores on the "Attention Problems," "Aggressive Behavior," and "Anxious/Depressed" scales in the CBCL, has been

associated with later severe psychopathology. In a sample of children with ADHD, this study sought to further explore the clinical characteristics, the response to methylphenidate medication, and the cognitive features of ADHD children with CBCL-DP.
METHOD: The sample consisted of 173 ADHD outpatients (age = 10.9 +/- 2.81) assessed using symptom severity scales, personality questionnaires (Emotionality Activity Sociability [EAS] and Junior Temperament and Character Inventory [JTCI]), and neuropsychological tests. A subsample of 136 participants was reassessed after optimal adjustment of methylphenidate dosage.
RESULTS AND CONCLUSION: Variables that were independently associated with CBCL-DP were clinical severity (ADHD Rating Scale [ADHD-RS]), internalized disorders, high emotionality (EAS), and low self-directedness (JTCI). CBCL-DP was associated neither with poorer response to methylphenidate nor with more side effects. There were no differences in cognitive performances between participants with and without CBCL-DP.

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J Child Adolesc Psychiatr Nurs. 2014 Dec.
THE ROLE OF FAMILY PHENOMENA IN CHILDREN AND ADOLESCENTS WITH ATTENTION DEFICIT HYPERACTIVITY DISORDER.
Paidipati CP, Deatrick JA.
TOPIC: Previous research suggests that families are integral to the understanding of children and adolescents with attention deficit hyperactivity disorder (ADHD).
PURPOSE: The purpose of this article is to identify family phenomena related to children and adolescents with ADHD and highlight research findings that intersect family phenomena with the care and treatment of ADHD in youth.
SOURCES: A literature review was conducted at the University of Pennsylvania in spring of 2014 using an online library system. The four major databases utilized are Cumulative Index to Nursing and Allied Health Literature (CINAHL), Ovid Medline, Scopus, and Psyc-INFO.
CONCLUSIONS: A wide array of family-related concepts are identified in the literature and represent a multifaceted and dynamic range of family phenomena related to ADHD youth. Four major themes emerged in the literature, including family stress and strain, parenting practices and caregiver health, family relationships, and family processes related to ADHD management. Different cultural and ethnic groups are reflected in the studies, but the majority of participants are self-identified Caucasian. As a collective, the research findings suggest family-related phenomena are essential and relevant to the investigation of children and adolescents with ADHD and worthwhile to explore in future research endeavors, especially in diverse populations.

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J Child Adolesc Psychopharmacol. 2014 Dec;24:562-69.
A RANDOMIZED PLACEBO-CONTROLLED DOUBLE-BLIND STUDY EVALUATING THE TIME COURSE OF RESPONSE TO METHYLPHENIDATE HYDROCHLORIDE EXTENDED-RELEASE CAPSULES IN CHILDREN WITH ATTENTION-DEFICIT/HYPERACTIVITY DISORDER.
Wigal SB, Greenhill LL, Nordbrock E, et al.
Objective: The purpose of this study was to assess the time of onset and time course of efficacy over 12.0 hours of extended-release multilayer bead formulation of methylphenidate (MPH-MLR) compared with placebo in children 6-12 years of age with attention-deficit/hyperactivity disorder (ADHD) in a laboratory school setting.
METHODS: This randomized double-blind placebo-controlled study included children 6-12 years of age with ADHD. Enrolled children went through four study phases: 1) Screening period (</=4 weeks) and a 2 day medication washout period; 2) open-label period with dose initiation of MPH-MLR 15 mg daily and individual dose optimization treatment period (2-4 weeks); 3) double-blind crossover period in which participants were randomized to sequences (1 week each) of placebo and the optimized MPH-MLR dose given daily; and 4) follow-up safety call. Analog classroom time course evaluations were performed at the end of each double-blind week. The primary efficacy end-point was the mean of the on-treatment/postdose Swanson, Kotkin, Agler, M-

Flynn, and Pelham (SKAMP)-Total scores over time points collected 1.0-12.0 hours after dosing. End-points were evaluated using a mixed-effects analysis of covariance.
RESULTS: The evaluable population included 20 participants. The least-squares mean postdose SKAMP-Total score was higher for placebo than for MPH-MLR (2.18 vs. 1.32, respectively; p=0.0001), indicating fewer symptoms with MPH-MLR therapy than with placebo. No difference in SKAMP-Total score between participants who received sequence 1 or sequence 2 was noted. From each of hours 1.0-12.0, least-squares mean SKAMP-Total score was significantly lower for those receiving MPH-MLR than for those receiving placebo (p</=0.0261). Neither serious adverse events nor new or unexpected safety findings were noted during the study.
CONCLUSIONS: MPH-MLR showed a significant decrease in SKAMP scores compared with placebo in children with ADHD 6-12 years of age, indicating a decrease in ADHD symptoms. The estimated onset was observed within 1.0 hour, and duration was measured to 12.0 hours postdose.
TRIAL REGISTRATION: ClinicalTrials.gov Identifier: NCT01269463.

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J Child Neurol. 2014 Dec.

FAMILIAL-ENVIRONMENTAL RISK FACTORS IN SOUTH AFRICAN CHILDREN WITH ATTENTION-DEFICIT HYPERACTIVITY DISORDER (ADHD): A CASE-CONTROL STUDY.

van DL, Springer P, Kidd M, et al.

We investigated familial and environmental risk factors in a cohort of South African children diagnosed with attention-deficit hyperactivity disorder (ADHD). A prospective, hospital-based case control study was conducted comprising 50 children diagnosed with ADHD and 50 matched non-ADHD controls. The adjusted effect of familial-environmental risk factors on ADHD was determined by systematic assessment. Birth complications, parental psychiatric disorder, maternal ADHD, early childhood trauma, and nonmaternal child care were significant risk factors for ADHD. Prolonged breastfeeding was found to be protective. In a multivariable logistic regression model, 5 criteria (birth complications, breastfeeding <3 months, at least 1 parent with tertiary education, presence of parental psychiatric disorder, and nonmaternal primary caregiver) differentiated ADHD from non-ADHD controls with a sensitivity and specificity of 74% and 86%, respectively. We found a correlation between certain familial and environmental risk factors and ADHD. A 5-criterion multivariable logistic regression model may offer clinical guidance in ADHD diagnosis.

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J Child Psychol Psychiatry. 2014 Dec.

ANNUAL RESEARCH REVIEW: RARE GENOTYPES AND CHILDHOOD PSYCHOPATHOLOGY - UNCOVERING DIVERSE DEVELOPMENTAL MECHANISMS OF ADHD RISK.

Scerif G, Baker K.

BACKGROUND: Through the increased availability and sophistication of genetic testing, it is now possible to identify causal diagnoses in a growing proportion of children with neurodevelopmental disorders. In addition to developmental delay and intellectual disability, many genetic disorders are associated with high risks of psychopathology, which curtail the wellbeing of affected individuals and their families. Beyond the identification of significant clinical needs, understanding the diverse pathways from rare genetic mutations to cognitive dysfunction and emotional-behavioural disturbance has theoretical and practical utility.
METHODS: We overview (based on a strategic search of the literature) the state-of-the-art on causal mechanisms leading to one of the most common childhood behavioural diagnoses - attention deficit hyperactivity disorder (ADHD) - in the context of specific genetic disorders. We focus on new insights emerging from the mapping of causal pathways from identified genetic differences to neuronal biology, brain abnormalities, cognitive processing differences and ultimately behavioural symptoms of ADHD.
FINDINGS: First, ADHD research in the context of rare genotypes highlights the complexity of multilevel mechanisms contributing to psychopathology risk. Second, comparisons between genetic disorders associated with similar psychopathology risks can elucidate convergent or distinct mechanisms at each level of analysis, which may inform therapeutic interventions and prognosis. Third, genetic disorders provide an unparalleled opportunity to observe dynamic developmental interactions between neurocognitive risk and behavioural

symptoms. Fourth, variation in expression of psychopathology risk within each genetic disorder points to putative moderating and protective factors within the genome and the environment.
CONCLUSION: A common imperative emerging within psychopathology research is the need to investigate mechanistically how developmental trajectories converge or diverge between and within genotype-defined groups. Crucially, as genetic predispositions modify interaction dynamics from the outset, longitudinal research is required to understand the multi-level developmental processes that mediate symptom evolution.

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J Child Psychol Psychiatry. 2015 Jan;56:49-57.
TRENDS IN PARENT- AND TEACHER-RATED EMOTIONAL, CONDUCT AND ADHD PROBLEMS AND THEIR IMPACT IN PREPUBERTAL CHILDREN IN GREAT BRITAIN: 1999-2008.
Sellers R, Maughan B, Pickles A, et al.
BACKGROUND: Evidence from Western countries indicates marked increases in diagnosis and treatment of childhood psychiatric disorders in recent years. These could reflect changes in prevalence of mental health problems, changes in their impact or increased clinical recognition and help-seeking. Epidemiological cross-cohort comparisons are required to test possible changes in prevalence, but are lacking for pre-adolescent children in Great Britain.
METHODS: Parent and teacher Strength and Difficulties Questionnaire (SDQ) ratings were used to compare rates of emotional, conduct and hyperactivity problems in 7-year-old children across three nationally representative British samples assessed in 1999 (n = 1033), 2004 (n = 648) and 2008 (n = 13 857). The SDQ impact supplement was used to assess associated distress, social, and educational impairment. Stratified analyses examined trends by gender and socio-economic group.
RESULTS: There was a decline in mean problem scores and a fall in the percentages scoring in the 'abnormal' range for all symptom types across the period of study. This decline was observed for all demographic groups, for parent and teacher reports, and was more marked for boys than girls. Both parent- and teacher-rated impact scores differed across the three cohorts for boys. Teacher-rated impact scores differed across cohorts for girls.
CONCLUSIONS: The first decade of the 21st Century saw a reduction in perceived levels of emotional and behaviour problems in pre-adolescent children in Great Britain. The threshold at which mental health problems have an impact on children's distress and classroom learning has changed over time. Continued monitoring of child mental health remains a priority.

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J Dent Hyg. 2014 Dec;88:342-47.
ATTENTION DEFICIT/HYPERACTIVITY DISORDER MEDICATION AND DENTAL CARIES IN CHILDREN.
Rosenberg SS, Kumar S, Williams NJ.
PURPOSE: Few studies have been conducted to investigate the effects, if any, of specific medication used to manage the symptoms of attention deficit/hyperactivity disorder (ADHD) as a risk factor for dental caries. A reported side-effect of the medication is a reduction in saliva. Healthy saliva has been shown to play many important functions in the prevention of dental caries. The focus of this review is to determine if any evidence exists to confirm that stimulant medication used to treat the symptoms of ADHD in children increases the risk of dental caries by virtue of its effect on the reduction of salivary flow.
METHODS: A MEDLINE search was conducted for relevant studies. Search terms used were dental caries, attention deficit/hyperactivity disorder, ADHD, pharmacologic treatment of ADHD, stimulant medication, xerostomia, dry-mouth and saliva flow. Publication dates ranged from 2002 to 2012.
RESULTS: Although dental caries prevalence has been found to be higher in children with ADHD, decreased salivary flow as a side-effect of pharmacological treatment does not appear to be responsible.
CONCLUSION: Dental caries is a multi-factorial disease process. The most effective method of reducing dental caries in ADHD children is more frequent recare visits focusing on home plaque removal practices along with

dietary counseling to reduce the consumption of cariogenic foods and drinks. This can only be accomplished with inclusion of the parent/guardian in the process.

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J Pediatr Psychol. 2014 Dec.

THE RELATIONSHIP BETWEEN WEIGHT STATUS AND EMOTIONAL AND BEHAVIORAL PROBLEMS IN SPANISH PRESCHOOL CHILDREN.

Perez-Bonaventura I, Granero R, Ezpeleta L.

OBJECTIVE: To examine cross-sectional and longitudinal associations between behavioral problems and weight status, considering body mass index (BMI) z-scores and overweight status, in a community sample of preschoolers.

METHODS: The Strengths and Difficulties Questionnaire and the Diagnostic Interview for Children and Adolescents were administered to 611 parents. Adjusted general linear models and binary logistic regressions were used.

RESULTS: Children who were overweight and had a higher BMI were at increased risk of peer problems and attention-deficit/hyperactivity disorder (ADHD) symptoms. Prospective analyses showed that a higher BMI at the age of 3 years was predictive of peer problems at ages 4 and 5 years and hyperactivity and ADHD symptoms at the age of 4 years.

CONCLUSION: This is the first study using a diagnostic-based instrument that shows a relationship between weight status and ADHD symptoms in preschoolers. Overweight children might benefit from screening for behavioral disorders and peer relationship problems.

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J Autism Dev Disord. 2014.

EMOTIONAL DISCLOSURE THROUGH JOURNAL WRITING: TELEHEALTH INTERVENTION FOR MATERNAL STRESS AND MOTHERNULLCHILD RELATIONSHIPS.

Whitney RV, Smith G.

This study examines emotional disclosure through the activity of journaling as a means of coping with maternal stress associated with parenting a child with disruptive behaviors. Through a randomized control and pre-test post-test study design of an online journal writing intervention, change to maternal stress and quality of mothernullchild relationship for children with ASD, ADHD and SPD was addressed. Behavioral symptoms were found to be the primary source of parenting stress for mothers and a significant relationship between child characteristics and maternal stress was identified. Emotional disclosure through the online journal writing program (especially in the presence of high disclosure of negative emotions) was shown to reduce maternal stress and improve the quality of mothernullchild relationship. These findings suggest cost-effective telehealth interventions may support maternal health. Important clinical implications are discussed.

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J Child Adolesc Psychopharmacol. 2014;24:419-25.

READING OUTCOMES OF CHILDREN AND ADOLESCENTS WITH ATTENTION-DEFICIT/HYPERACTIVITY DISORDER AND DYSLEXIA FOLLOWING ATOMOXETINE TREATMENT.

Shaywitz BA, Williams DW, Fox BK, et al.

Objective: This study assessed the efficacy of atomoxetine on attention-deficit/hyperactivity disorder (ADHD) symptoms in children and adolescents having ADHD with comorbid dyslexia (ADHD + D) and the effects of the treatment on reading measures.

Methods: The analyses in this report used data froma study designed to examine the effects of a nonstimulant pharmacological agent, atomoxetine, on reading in children with ADHD + D. Patients ages 10-16 years with ADHD or ADHD + D received open-label atomoxetine for 16 weeks. The ADHD Rating Scale (ADHD-RS) and reading subtests of the Kaufman Test of Educational Achievement (K-TEA) were assessed. Changes in ADHD

symptoms and reading scores were also analyzed by ADHD subtype. Treatment effect sizes and correlations between changes in ADHDRS and K-TEA scores were calculated.
Results: After atomoxetine treatment, both ADHD and ADHD + D patient groups showed significant reduction in ADHD symptom and improvements in K-TEA reading scores. The range of treatment effect sizes on K-TEA scores was 0.35-0.53 for the ADHD group and 0.50-0.62 for the ADHD + D group. Pearson's correlation coefficients revealed only a few weak correlations between changes in ADHD symptoms and reading scores, regardless of diagnostic group.
Conclusions: ADHD symptoms and K-TEA reading scores improved for both the ADHD and ADHD + D groups following atomoxetine treatment. Correlation analyses indicate that improvements in reading outcomes cannot be explained by a reduction of ADHD symptoms alone. These findings support further exploration of the potential effects of atomoxetine on reading in children with ADHD and dyslexia or dyslexia alone

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J Child Adolesc Psychopharmacol. 2014;24:472-80.

TREATMENT RECEIPT AND OUTCOMES FROM A CLINIC EMPLOYING THE ATTENTION-DEFICIT/HYPERACTIVITY DISORDER TREATMENT GUIDELINE OF THE CHILDREN'S MEDICATION ALGORITHM PROJECT.

Wagner DJ, Vallerand IA, McLennan JD.

Objective: Little is known about the pattern of service receipt and outcomes from clinics implementing best practice guidelines in child mental health. This study aimed to determine these variables for a clinic that implemented an attention-deficit/hyperactivity disorder (ADHD) treatment guideline proposed by the Children's Medication Algorithm Project (CMAP).
Methods: Secondary analyses of medical record extracts were conducted for children who received treatment from 2007 to 2012 in a specialty clinic linked to a public children's hospital in Canada. Patterns of medication selection and dosing were compared with CMAP guidelines. Outcomes were based on parent and teacher ratings on the ADHD portion of the Multimodal Treatment Study for ADHD (MTA)- Swanson, Nolan, and Pelham, Version IV (SNAP-IV).
Results: Data were available for 132 children (ages 5-14), 81.8% of whom had no previous ADHD medication exposure, and 97.0% of whom had started at least one medication. Methylphenidate was used first for 59.8% of children, whereas 33.3% started with an amphetamine product. Of the 47.0% of children who progressed to a second medication trial, 88.7% tried a stimulant from a second class. In total, 19.7% tried atomoxetine, which was typically used as a third stage choice (i.e., after two different stimulant exposures). Stage four to six medications were rarely used, rather stimulants were retried after atomoxetine and/or medication combinations were tried. Symptomatic remission at the end of treatment was achieved by 70.4% and 82.4%, according to parents and teachers respectively, for those with outcome data and who completed treatment. Outcomes for those further along the treatment algorithm were similar to discharges at the beginning of the algorithm.
Conclusions: The high rates of symptomatic remission observed within this clinical service may be a function of adherence to CMAP recommendations. However, the lack of a comparison group or experimental design prevents determination of causality. Additional investigations of the impacts of implementing evidence-based guidelines are critically needed, with proposed benchmarks to inform outcome evaluations

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J Child Adolesc Psychopharmacol. 2014;24:448-53.

EFFECT OF METHYLPHENIDATE ON HEIGHT AND WEIGHT IN KOREAN CHILDREN AND ADOLESCENTS WITH ATTENTION-DEFICIT/HYPERACTIVITY DISORDER: A RETROSPECTIVE CHART REVIEW.

Kim H-W, Kim S-O, Shon S, et al.

Objective: The purpose of this study was to investigate the effect of methylphenidate (MPH) on growth in Korean children and adolescents with attention-deficit/hyperactivity disorder (ADHD).
Methods: The medical records of 157 subjects (mean age 8.9 (plus or minus) 2.2 years; 134 boys) with ADHD who received treatment with MPH for at least 1 year at the Department of Psychiatry at Asan Medical Center were retrospectively reviewed. Height and weight were prospectively obtained and retrospectively gathered. Height and weight were converted to age- and gender-corrected standard scores (z scores) using norms from

the Korean population. Growth changes were analyzed from the starting to the end of treatment using random coefficients models with change in weight or height z score as the dependent variable.
Results: Weight ((beta) = - 0.109, p < 0.001) and height ((beta) = - 0.072, p < 0.001) z scores significantly decreased during treatment. Weight z score decreased more in girls ((beta) = - 0.247, p < 0.001) than in boys ((beta) = - 0.090, p < 0.001). Weight z score decreased during the 1st year of medication ((beta) = - 0.327, p < 0.001 for boys; (beta) = - 0.646, p < 0.001 for girls), and did not change or increase after the 1st year. Height z score significantly decreased during treatment ((beta) = - 0.072, p < 0.001) after controlling for the effect of age at treatment, gender, mean daily mg/kg dose, and comorbid depressive disorder. Height z score also decreased during the 1st year of medication ((beta) = - 0.089, p < 0.001) but did not change after the 1st year.
Conclusions: These results suggest thatMPHcould be related to weight and height deficit in Korean children and adolescents, although the effects were minor, and disappeared after the 1st year. Because of the limitations of this study such as retrospective design, selection bias, and high attrition rate, further prospective studies are needed

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J Child Adolesc Psychopharmacol. 2014;24:501-08.

EFFECTS OF KOREAN RED GINSENG EXTRACT ON BEHAVIOR IN CHILDREN WITH SYMPTOMS OF INATTENTION AND HYPERACTIVITY/IMPULSIVITY: A DOUBLE-BLIND RANDOMIZED PLACEBO-CONTROLLED TRIAL.

Ko H-J, Kim I, Kim J-B, et al.

Objective: There is evidence that Korean red ginseng (KRG) can reduce the production of the adrenal corticosteroids, cortisol, and dehydroepiandrosterone (DHEA), and thus may be a viable treatment for attention-deficit/hyperactivity disorder (ADHD). The present randomized double-blind placebo-controlled clinical trial tested the effect of KRG on children with ADHD symptoms.
Methods: Subjects 6-15 years, who satisfied the inclusion criteria and had ADHD symptoms, were randomized into a KRG group (n = 33) or a control group (n = 37). The KRG group received one pouch of KRG (1g KRG extract/pouch) twice a day, and the control group received one pouch of placebo twice a day. At the 8 week point, the primary outcomes were the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV) criteria for inattention and hyperactivity scale scores, which were measured at baseline and 8 weeks after starting treatment. Secondary outcomes were quantitative electroencephalography theta/beta ratio (QEEG TBR) (measured at baseline and week 8) and salivary cortisol and DHEA levels (measured at baseline and at 4 and 8 weeks).
Results: The baseline characteristics of the KRG and control groups were not statistically different. Themean ages of the KRG and control groups were 10.94 (plus or minus) 2.26 and 10.86 (plus or minus) 2.41, respectively. The KRG group had significantly decreased inattention/hyperactivity scores comparedwith the control group atweek 8 (least squaredmeans of the differences in inattention adjusted for baseline scores: -2.25 vs. -1.24, p = 0.048; hyperactivity: -1.53 vs. -0.61, p = 0.047). The KRG group had significantly decreased QEEG TBR compared with the control group (least squared means of the differences: -0.94 vs. -0.14, p = 0.001). However, neither the KRG group nor the control group exhibited significant differences in salivary cortisol or DHEA levels at week 8 compared with the baseline levels. No serious adverse events were reported in either group.
Conclusions: These results suggest that KRG extract may be an effective and safe alternative treatment for children with inattention and hyperactivity/impulsivity symptoms. Further studies to investigate the efficacy and safety of KRG are warranted

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J Consult Clin Psychol. 2014.

EFFECTS OF BEHAVIORAL AND PHARMACOLOGICAL THERAPIES ON PEER REINFORCEMENT OF DEVIANCY IN CHILDREN WITH ADHD-ONLY, ADHD AND CONDUCT PROBLEMS, AND CONTROLS.

Helseth SA, Waschbusch DA, Gnagy EM, et al.

Objective: This study compared the unique and combined effects of evidence-based treatments for ADHD-stimulant medication and behavior modification-on children's rates of reinforcement for deviant peer behavior (RDPB).

Method: Using a within-subjects design, 222 elementary school-age children attending a summer treatment program, including 151 children with ADHD (127 male), with and without comorbid conduct problems, and 71 control children (57 male), received varying combinations of behavior modification (no, low-intensity, and high-intensity) and methylphenidate (placebo, 0.15 mg/kg, 0.30 mg/kg, and 0.60 mg/kg). RDPB was measured through direct observation and compared across all behavior modification and medication conditions.

Results: Children with ADHD reinforced the deviant behavior of their peers at a significantly higher rate than control children in the absence of either intervention. However, that difference largely disappeared in the presence of both behavior modification and medication. Both low and high-intensity behavior modification, as well as medium (0.30 mg/kg) and high (0.60 mg/kg) doses of methylphenidate, significantly reduced the rate of ADHD children's RDPB to levels similar to the control group.

Conclusions: Results indicate that although untreated children with ADHD do engage in RDPB at a greater rate than their non-ADHD peers, existing evidence-based interventions can substantially decrease the presence of RDPB, thereby limiting potential iatrogenic effects in group-based treatment settings.

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J Consult Clin Psychol. 2014.

ELECTRODERMAL RESPONDING PREDICTS RESPONSES TO, AND MAY BE ALTERED BY, PRESCHOOL INTERVENTION FOR ADHD.

Beauchaine TP, Neuhaus E, Gatzke-Kopp LM, et al.

Objectives: To evaluate electrodermal activity (EDA) as a prospective biomarker of treatment response, to determine whether patterns of EDA are altered by treatment, and to assess oppositional defiant disorder (ODD) as a possible moderator of trajectories in EDA after an empirically supported behavioral intervention for attention-deficit hyperactivity disorder (ADHD) in preschool.

Method: Nonspecific fluctuations (NSFs) in skin conductance, which index sympathetic nervous system activity, were assessed among 4-6 year old children with ADHD (n = 99) before they participated with their parents in 1 of 2 versions of the Incredible Years intervention. All were reassessed at posttreatment, and a subgroup (n = 49) were assessed again at 1-year follow-up.

Results: No difference in pretreatment NSFs was observed between ADHD participants and a group of normal control children (n = 41). Nevertheless, among those with ADHD, fewer NSFs at pretest predicted poorer treatment response on 4 of 7 externalizing outcomes. Furthermore, treatment was associated with increasing NSFs across time, but not for those who scored high on ODD at pretest.

Conclusions: Low EDA appears to mark resistance to treatment among preschoolers with ADHD. Furthermore, although our study was not experimental, treatment was associated with longitudinal increases in EDA, which were not observed in a normal control group. This may suggest increased sensitivity to discipline, with positive implications for long term outcome. In contrast to treated participants as a whole, however, those who scored high on ODD at pretest exhibited reduced EDA over time.

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Journal of Experimental and Clinical Medicine (Taiwan). 2014;6:190-94.

RISKS OF ABNORMAL INTERNET USE AMONG ADOLESCENTS WITH ATTENTION-DEFICIT/HYPERACTIVITY DISORDER.

Wu J-H, Chang Y-C, Tzang R-F.

Purpose: This aim of the study is to investigate the risks among adolescents with attention-deficit/hyperactivity disorder (ADHD) who develop compulsive Internet use (CIU) and adolescents who do not develop CIU.

Methods: Seventy-eight adolescents with ADHD completed general demographic questionnaires that included information on body mass index, subtype, comorbidity, and behavioral problems. The family characteristics included information on parental ADHD diagnosis, psychiatric symptoms, and media exposure problems. The respondents were categorized as ADHD with CIU or ADHD with non-CIU, based on the Internet addiction cutoff point by the standardized measurements of the Chen Internet Addiction Scale.
Results: The results revealed 12.8% of the adolescents with ADHD had CIU. They were characterized by average height, tendency to withdraw, having a young father, and playing computer games for more than 1 hour daily.
Conclusion: More attention to ADHD adolescents with CIU is warranted. An early intervention program is suggested for their social withdrawal tendency.

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J Neurosci. 2014;34:16555-66.
MODALITY-SPANNING DEFICITS IN ATTENTION-DEFICIT/ HYPERACTIVITY DISORDER IN FUNCTIONAL NETWORKS, GRAY MATTER, AND WHITE MATTER.
Kessler D, Angstadt M, Welsh RC, et al.
Previous neuroimaging investigations in attention-deficit/hyperactivity disorder (ADHD) have separately identified distributed structural and functional deficits, but interconnections between these deficits have not been explored. To unite these modalities in a common model, we used joint independent component analysis, a multivariate, multimodal method that identifies cohesive components that span modalities. Based on recent network models of ADHD, we hypothesized that altered relationships between large-scale networks, in particular, default mode network (DMN) and task-positive networks (TPNs), would co-occur with structural abnormalities in cognitive regulation regions. For 756 human participants in the ADHD-200 sample, we produced gray and white matter volume maps with voxel-based morphometry, as well as whole-brain functional connectomes. Joint independent component analysis was performed, and the resulting transmodal components were tested for differential expression in ADHD versus healthy controls. Four components showed greater expression in ADHD. Consistent with our a priori hypothesis, we observed reduced DMN-TPN segregation co-occurring with structural abnormalities in dorsolateral prefrontal cortex and anterior cingulate cortex, two important cognitive control regions. We also observed altered intranetwork connectivity in DMN, dorsal attention network, and visual network, with co-occurring distributed structural deficits. There was strong evidence of spatial correspondence across modalities: For all four components, the impact of the respective component on gray matter at a region strongly predicted the impact on functional connectivity at that region. Overall, our results demonstrate that ADHD involves multiple, cohesive modality spanning deficits, each one of which exhibits strong spatial overlap in the pattern of structural and functional alterations.

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J Psychopharmacol. 2015;29:24-30.
PREDICTING METHYLPHENIDATE RESPONSE IN ATTENTION DEFICIT HYPERACTIVITY DISORDER: A PRELIMINARY STUDY.
Johnston BA, Coghill D, Matthews K, et al.
Methylphenidate (MPH) is established as the main pharmacological treatment for patients with attention deficit hyperactivity disorder (ADHD). Whilst MPH is generally a highly effective treatment, not all patients respond, and some experience adverse reactions. Currently, there is no reliable method to predict how patients will respond, other than by exposure to a trial of medication. In this preliminary study, we sought to investigate whether an accurate predictor of clinical response to methylphenidate could be developed for individual patients, using sociodemographic, clinical and neuropsychological measures. Of the 43 boys with ADHD included in this proof-of-concept study, 30 were classed as responders and 13 as non-responders to MPH, with no significant differences in age nor verbal intelligence quotient (IQ) between the groups. Here we report the application of a multivariate analysis approach to the prediction of clinical response to MPH, which achieved an accuracy of 77% ($p = 0.005$). The most important variables to the classifier were performance on a 'go/no go' task and comorbid conduct disorder. This preliminary study suggested that further investigation is merited. Achieving a highly

significant accuracy of 77% for the prediction of MPH response is an encouraging step towards finding a reliable and clinically useful method that could minimise the number of children needlessly being exposed to MPH.

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Journal of Research in Pharmacy Practice. 2014;3:130-36.

ADVERSE REACTIONS OF METHYLPHENIDATE IN CHILDREN WITH ATTENTION DEFICIT-HYPERACTIVITY DISORDER: REPORT FROM A REFERRAL CENTER.

Khajehpiri Z, Mahmoudi-Gharaei J, Faghihi T, et al.

Objective: The aim of the current study was to determine various aspects of methylphenidate adverse reactions in children with attention deficit-hyperactivity disorder (ADHD) in Iran.

Methods: During the 6 months period, all children under methylphenidate treatment alone or along with other agents attending a university-affiliated psychology clinic were screened regarding all subjective and objective adverse drug reactions (ADRs) of methylphenidate. Causality and seriousness of detected ADRs were assessed by relevant World Health Organization definitions. The Schumock and Thornton questionnaire was used to determine preventability of ADRs.

Findings: Seventy-one patients including 25 girls and 46 boys with ADHD under methylphenidate treatment were enrolled within the study period. All (100%) ADHD children under methylphenidate treatment developed at least one ADR. Anorexia (74.3%), irritability (57.1%), and insomnia (47.2%) were the most frequent methylphenidate-related adverse reactions. Except for one, all other detected ADRs were determined to be mild. In addition, no ADR was considered to be preventable and serious.

Conclusion: Our data suggested that although methylphenidate related adverse reactions were common in children with ADHD, but they were mainly mild and nonserious.

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Kaohsiung J Med Sci. 2014 Dec;30:631-38.

SYMPTOMS OF ATTENTION DEFICIT HYPERACTIVITY DISORDER AND QUALITY OF LIFE OF MOTHERS OF SCHOOL-AGED CHILDREN: THE ROLES OF CHILD, MOTHER, AND FAMILY VARIABLES.

Chen VC, Yeh CJ, Lee TC, et al.

This study examined the impact of inattention and hyperactivity symptoms in children and mothers, opposition problems in children, maternal depression, and perceived family support on the quality of life (QOL) of mothers. Mothers of children in one elementary school were contacted. The relationship between sociodemographic variables, the levels of inattention and hyperactivity symptoms in children and mothers, oppositional symptoms in children, maternal depression, perceived family support, and maternal QOL were examined. Three hundred and eighty-two participants were included in this study. Consistent factors related to the mother's QOL in the four domains were maternal depression, perceived family support, and housing status after controlling for several family, maternal, and child variables. Maternal QOL was more related to her own and family factors including maternal inattention, hyperactivity and depression symptoms, perceived family support, and housing status, instead of parent-rated inattention and hyperactivity symptoms of the child. Screening for maternal inattention, hyperactivity and depression symptoms, and mental health services for these mothers are warranted based on these findings.

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Med Sci Monit. 2014;20:2256-68.

ATTENTION DYSFUNCTION SUBTYPES OF DEVELOPMENTAL DYSLEXIA.

Lewandowska M, Milner R, Ganc M, et al.

Background: Previous studies indicate that many different aspects of attention are impaired in children diagnosed with developmental dyslexia (DD). The objective of the present study was to identify cognitive profiles of DD on the basis of attentional test performance

Material/Methods: 78 children with DD (30 girls, 48 boys, mean age of 12 years (plus or minus)8 months) and 32 age- and sex-matched nondyslexic children (14 girls, 18 boys) were examined using a battery of

standardized tests of reading, phonological and attentional processes (alertness, covert shift of attention, divided attention, inhibition, flexibility, vigilance, and visual search). Cluster analysis was used to identify subtypes of DD
Results: Dyslexic children showed deficits in alertness, covert shift of attention, divided attention, flexibility, and visual search. Three different subtypes of DD were identified, each characterized by poorer performance on the reading, phonological awareness, and visual search tasks. Additionally, children in cluster no. 1 displayed deficits in flexibility and divided attention. In contrast to non-dyslexic children, cluster no. 2 performed poorer in tasks involving alertness, covert shift of attention, divided attention, and vigilance. Cluster no. 3 showed impaired covert shift of attention
Conclusions: These results indicate different patterns of attentional impairments in dyslexic children. Remediation programs should address the individual childnulls deficit profile

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Molecular Genetics and Metabolism. 2014.
A RANDOMIZED, PLACEBO-CONTROLLED, DOUBLE-BLIND STUDY OF SAPROPTERIN TO TREAT ADHD SYMPTOMS AND EXECUTIVE FUNCTION IMPAIRMENT IN CHILDREN AND ADULTS WITH SAPROPTERIN-RESPONSIVE PHENYLKETONURIA.
Burton B, Grant M, Feigenbaum A, et al.
Symptoms of attention deficit-hyperactivity disorder (ADHD), particularly inattention, and impairments in executive functioning have been reported in early and continuously treated children, adolescents, and adults with phenylketonuria (PKU). In addition, higher blood phenylalanine (Phe) levels have been correlated with the presence of ADHD symptoms and executive functioning impairment. The placebo-controlled PKU ASCEND study evaluated the effects of sapropterin therapy on PKU-associated symptoms of ADHD and executive and global functioning in individuals who had a therapeutic blood Phe response to sapropterin therapy. The presence of ADHD inattentive symptoms and executive functioning deficits was confirmed in this large cohort of 206 children and adults with PKU, of whom 118 responded to sapropterin therapy. In the 38 individuals with sapropterin-responsive PKU and ADHD symptoms at baseline, sapropterin therapy resulted in a significant improvement in ADHD inattentive symptoms in the first 4. weeks of treatment, and improvements were maintained throughout the 26. weeks of treatment. Sapropterin was well-tolerated with a favorable safety profile. The improvements in ADHD inattentive symptoms and aspects of executive functioning in response to sapropterin therapy noted in a large cohort of individuals with PKU indicate that these symptoms are potentially reversible when blood Phe levels are reduced.

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Monogr Soc Res Child Dev. 2014 Dec;79:93-118.
VI. THE ROLE OF PHYSICAL ACTIVITY IN REDUCING BARRIERS TO LEARNING IN CHILDREN WITH DEVELOPMENTAL DISORDERS.
Pontifex MB, Fine JG, da CK, et al.
Emerging research suggests that physical activity may be an effective non-pharmaceutical intervention approach for childhood developmental disorders. Findings indicate that both single bouts of activity and chronic physical activity associate with improved mental health and classroom performance in children with attention-deficit/hyperactivity disorder and children with autism spectrum disorders. This review describes the research in this area and identifies limitations and challenges to the translation of these findings to promote physical activity in clinical practice and educational policy.

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NeuroImage Clin. 2014;7:222-29.
DISTINCT FRONTAL LOBE MORPHOLOGY IN GIRLS AND BOYS WITH ADHD.
Dirlikov B, Shiels RK, Crocetti D, et al.
Objective This study investigated whether frontal lobe cortical morphology differs for boys and girls with ADHD (ages 8-12 years) in comparison to typically developing (TD) peers

Method Participants included 226 children between the ages of 8-12 including 93 children with ADHD (29 girls) and 133 TD children (42 girls) for which 3T MPRAGE MRI scans were obtained. A fully automated frontal lobe atlas was used to generate functionally distinct frontal subdivisions, with surface area (SA) and cortical thickness (CT) assessed in each region. Analyses focused on overall diagnostic differences as well as examinations of the effect of diagnosis within boys and girls
Results Girls, but not boys, with ADHD showed overall reductions in total prefrontal cortex (PFC) SA. Localization revealed that girls showed widely distributed reductions in the bilateral dorsolateral PFC, left inferior lateral PFC, right medial PFC, right orbitofrontal cortex, and left anterior cingulate; and boys showed reduced SA only in the right anterior cingulate and left medial PFC. In contrast, boys, but not girls, with ADHD showed overall reductions in total premotor cortex (PMC) SA. Further localization revealed that in boys, premotor reductions were observed in bilateral lateral PMC regions; and in girls reductions were observed in bilateral supplementary motor complex. In line with diagnostic group differences, PMC and PFC SAs were inversely correlated with symptom severity in both girls and boys with ADHD
Conclusions These results elucidate sex-based differences in cortical morphology of functional subdivisions of the frontal lobe and provide additional evidence of associations among SA and symptom severity in children with ADHD.

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NeuroImage Clin. 2015;7:68-81.

CONNECTIVITY SUPPORTING ATTENTION IN CHILDREN WITH ATTENTION DEFICIT HYPERACTIVITY DISORDER.

Barber AD, Jacobson LA, Wexler JL, et al.

Intra-subject variability (ISV) is the most consistent behavioral deficit in Attention Deficit Hyperactivity Disorder (ADHD). ISV may be associated with networks involved in sustaining task control (cingulo-opercular network: CON) and self-reflective lapses of attention (default mode network: DMN). The current study examined whether connectivity supporting attentional control is atypical in children with ADHD. Group differences in full-brain connection strength and brain-behavior associations with attentional control measures were examined for the late-developing CON and DMN in 50 children with ADHD and 50 typically-developing (TD) controls (ages 8-12 years). Children with ADHD had hyper-connectivity both within the CON and within the DMN. Full-brain behavioral associations were found for a number of between-network connections. Across both groups, more anti-correlation between DMN and occipital cortex supported better attentional control. However, in the TD group, this brain-behavior association was stronger and occurred for a more extensive set of DMN-occipital connections. Differential support for attentional control between the two groups occurred with a number of CON-DMN connections. For all CON-DMN connections identified, increased between-network anti-correlation was associated with better attentional control for the ADHD group, but worse attentional control in the TD group. A number of between-network connections with the medial frontal cortex, in particular, showed this relationship. Follow-up analyses revealed that these associations were specific to attentional control and were not due to individual differences in working memory, IQ, motor control, age, or scan motion. While CON-DMN anti-correlation is associated with improved attention in ADHD, other circuitry supports improved attention in TD children. Greater CON-DMN anti-correlation supported better attentional control in children with ADHD, but worse attentional control in TD children. On the other hand, greater DMN-occipital anti-correlation supported better attentional control in TD children

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NeuroImage Clin. 2015;7:132-41.

CAPTURING THE DYNAMICS OF RESPONSE VARIABILITY IN THE BRAIN IN ADHD.

Van BJ, Van RT, Bos DJ, et al.

ADHD is characterized by increased intra-individual variability in response times during the performance of cognitive tasks. However, little is known about developmental changes in intra-individual variability, and how these changes relate to cognitive performance. Twenty subjects with ADHD aged 7-24 years and 20 age-matched, typically developing controls participated in an fMRI-scan while they performed a go-no-go task. We fit an ex-Gaussian distribution on the response distribution to objectively separate extremely slow responses,

related to lapses of attention, from variability on fast responses. We assessed developmental changes in these intra-individual variability measures, and investigated their relation to no-go performance. Results show that the ex-Gaussian measures were better predictors of no-go performance than traditional measures of reaction time. Furthermore, we found between-group differences in the change in ex-Gaussian parameters with age, and their relation to task performance: subjects with ADHD showed age-related decreases in their variability on fast responses (sigma), but not in lapses of attention (tau), whereas control subjects showed a decrease in both measures of variability. For control subjects, but not subjects with ADHD, this age-related reduction in variability was predictive of task performance. This group difference was reflected in neural activation: for typically developing subjects, the age-related decrease in intra-individual variability on fast responses (sigma) predicted activity in the dorsal anterior cingulate gyrus (dACG), whereas for subjects with ADHD, activity in this region was related to improved no-go performance with age, but not to intra-individual variability. These data show that using more sophisticated measures of intra-individual variability allows the capturing of the dynamics of task performance and associated neural changes not permitted by more traditional measures.

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Neuropsychobiology. 2014;210-19.

IS EXCESSIVE ELECTROENCEPHALOGRAPHY BETA ACTIVITY ASSOCIATED WITH DELINQUENT BEHAVIOR IN MEN WITH ATTENTION-DEFICIT HYPERACTIVITY DISORDER SYMPTOMATOLOGY?

Meier NM, Perrig W, Koenig T.

Background/Aims: The attention-deficit/hyperactivity disorder (ADHD) shows an increased prevalence in delinquents compared to the normal population. In recent studies, a subgroup of subjects with ADHD as well as a subgroup of delinquents displayed excessive electroencephalography (EEG) beta activity, which has been associated with antisocial behavior in ADHD children. We investigated whether delinquent behavior in adults with ADHD symptomatology is related to excessive beta activity.

Methods: We compared the resting state EEGs (eyes open/closed) of delinquent and nondelinquent subjects with ADHD symptoms and those of a control group regarding EEG power spectra and topography.

Results: Delinquents with ADHD symptomatology showed more beta power at frontal, central and parietal brain regions than nondelinquents with ADHD symptoms.

Conclusion: Excessive beta power may thus represent a risk factor for delinquent behavior in adults with ADHD symptomatology. The awareness of such a risk factor may be helpful in the assessment of the risk for delinquent behavior in a psychiatric context and may provide a neurobiological background for therapeutic interventions.

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Neuropsychopharmacol Hung. 2014 Jun;16:91-97.

THE INFLUENCE OF ATTENTION-DEFICIT HYPERACTIVITY DISORDER ON QUALITY OF LIFE: CASE REPORTS.

Dallos G, Balazs J.

Recently the concept of Quality of Life has gained increasing importance in Psychiatry. Studies focusing on how much attention-deficit hyperactivity disorder (ADHD) - one of the most prevalent psychiatric disorders among children - affects the every day life found that children with ADHD had significantly lower Quality of Life than healthy controls or children with other psychiatric or physical disorders. In the current paper we present the case of two boys with ADHD and their families. These cases demonstrate that adequate treatment of the symptoms of ADHD can improve Quality of Life of the patients and their families, moreover, different life events can worsen the symptoms of ADHD. Professionals should ensure flexible treatment, which conforms to the above described processes.

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Neurosci Behav Physiol. 2014.

AN INTERDISCIPLINARY APPROACH TO ANALYSIS OF THE CEREBRAL MECHANISMS OF LEARNING DIFFICULTIES IN CHILDREN. EXPERIENCE OF STUDIES OF CHILDREN WITH SIGNS OF ADHD.

Machinskaya RI, Sugrobova GA, Semenova OA.

We present here an interdisciplinary approach to studies of the cerebral mechanisms of learning difficulties in children of junior school age. A complex electroencephalographic (EEG) and neuropsychological analysis was used to identify neurophysiological factors for cognitive deficits in children aged 7null8 and 9null10 years with signs of attention deficit hyperactivity disorder (ADHD). EEG traces in calm waking in children with signs of ADHD contained patterns characteristic of a nonoptimal state of the frontothalamic regulatory system, with bilaterally synchronous groups of frontal theta waves, along with local deviations in cortical electrical activity in the right hemisphere significantly more commonly than traces from children of the control group. In addition, children with signs of ADHD had a higher frequency of EEG changes pointing to a deficit in the total level of activation by the brainstem reticular formation, in the form of a hypersynchronous alpha rhythm and/or groups of theta waves in the caudal areas, than the control group. Children with signs of ADHD showed a relationship between the characteristics of the cognitive deficit and the presence of one of these three types of EEG abnormality. Children of both age groups with EEG signs of the nonoptimal state of the frontothalamic system demonstrated marked deficiency of programming functions, regulation and control of activity (executive functions), along with difficulties in performing auditory-verbal tasks. In children with local abnormalities of electrical activity in the right hemisphere, the deficit in executive functions was combined with difficulties in performing nonverbal tasks. Decreases in the level of nonspecific activation mainly affected work capacity and the rate of performance of cognitive tasks in both age groups. Children aged 7null8 years with signs of decreased activation also showed difficulty in processing nonverbal information. Thus, the results obtained by interdisciplinary investigations identified at least three types of abnormalities in the functional state of the brain which could produce decreases in the effectiveness of different components of cognitive activity in children with ADHD.

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NeuroToxicology. 2014;45:185-91.

S100(BETA) IN HEAVY METAL-RELATED CHILD ATTENTION-DEFICIT HYPERACTIVITY DISORDER IN AN INFORMAL E-WASTE RECYCLING AREA.

Liu W, Huo X, Liu D, et al.

Exposure to lead even at low levels correlates with attention-deficit/hyperactivity disorder (ADHD). However, lead-contaminated environments are often contaminated with other heavy metals that could exacerbate lead-induced ADHD. We conducted this study to evaluate the relationship between multiple heavy metals and child behaviors, and the involvement of S100 calcium-binding protein (beta) (S100(beta)) expression in child ADHD in Guiyu, an internationally-known e-waste contaminated recycling town. Two hundred and forty kindergarten children, 3- to 7-years of age, who lived in Guiyu, were recruited for this study. Child behavioral assessment was derived from parent and teacher ratings. Serum S100(beta) was assayed by an enzyme-linked immunosorbent assay (ELISA). Lead (Pb), cadmium (Cd) and manganese (Mn) levels in whole blood were measured using graphite furnace atomic absorption spectrometry (GFAAS). The prevalence of children with ADHD symptoms in Guiyu was 18.6%, with the percentage of children suspected to have behavior problems being 46.2% or 46.5%, based on the Rutter parents' or teachers' scale scores, respectively. Child blood levels of Pb, Cd, and Mn correlated with certain behavioral abnormalities, such as conduct problems and antisocial behavior. Serum S100(beta) levels were associated with heavy metal levels in blood, and certain behavioral abnormalities. These findings suggest that exposure to various environmental heavy metals in Guiyu might result in child behavior disorders. Results also indicate that S100(beta) may provide information for laboratory evaluation of neurotoxicity.

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Nord J Psychiatry. 2015 Jan;69:1-18.

DIET IN THE TREATMENT OF ADHD IN CHILDREN-A SYSTEMATIC REVIEW OF THE LITERATURE .

Heilskov Rytter MJ, Andersen LB, Houmann T, et al .

Background: Attention-deficit/hyperactivity disorder (ADHD) is one of the most prevalent psychiatric conditions in childhood. Dietary changes have been suggested as a way of reducing ADHD symptoms.
AIMS: To provide an overview of the evidence available on dietary interventions in children with ADHD, a systematic review was carried out of all dietary intervention studies in children with ADHD.
METHODS: Relevant databases were searched in October 2011, with an update search in March 2013. The studies included describe diet interventions in children with ADHD or equivalent diagnoses measuring possible changes in core ADHD symptoms: inattention, hyperactivity and impulsivity.
RESULTS: A total of 52 studies were identified, some investigating whether ADHD symptoms can improve by avoiding certain food elements (20 studies), and some whether certain food elements may reduce ADHD symptoms (32 studies).
CONCLUSION: Elimination diets and fish oil supplementation seem to be the most promising dietary interventions for a reduction in ADHD symptoms in children. However, the studies on both treatments have shortcomings, and more thorough investigations will be necessary to decide whether they are recommendable as part of ADHD treatment.

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Pediatrics. 2014 Dec;134:1221-22.

CHARACH ET AL. INTERVENTIONS FOR PRESCHOOL CHILDREN AT HIGH RISK FOR ADHD: A COMPARATIVE EFFECTIVENESS REVIEW. PEDIATRICS. 2013;131(5):E1584-E1604.

Anon.

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Phys Occup Ther Pediatr. 2015 Feb;35:13-23.

EFFECT OF COGNITIVE INTERVENTION ON CHILDREN WITH ADHD.

Gharebaghy S, Rassafiani M, Cameron D.

Although not considered a diagnostic criterion in DSM-IV, motor difficulties in children with Attention Deficit Hyperactivity Disorder (ADHD) are commonly reported. Prevalence of co-morbidity of ADHD and Developmental Coordination Disorder is as high as 50%. Cognitive Orientation to daily Occupational Performance (CO-OP) is a problem-solving approach originally developed for children with Developmental Coordination Disorder. In this approach, therapists support children to use cognitive strategies in a process of guided discovery to solve occupational performance problems. A single case experimental design (multiple baselines) was used to examine the influence of a 12-week intervention using CO-OP with six children with ADHD. Outcome measures included the Canadian Occupational Performance Measure (COPM), Goal Attainment Scaling and the Bruininks-Oseretsky Test of Motor Proficiency and Performance (BOTMP). The results of this study demonstrated improvements in both goals and motor performance in the participants due to the intervention. These results provide some support for the use of CO-OP with children with ADHD. Further research into the application of CO-OP with children with ADHD is warranted based on these preliminary positive findings regarding the efficacy of this intervention to address motor-based performance difficulties.

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Prog Neuro-Psychopharmacol Biol Psychiatry. 2015;57:176-84.

ATTENTION DEFICIT/HYPERACTIVITY DISORDER AND MEDICATION WITH STIMULANTS IN YOUNG CHILDREN: A DTI STUDY.

De Luis-Garcia R, Cabus-Pinol G, Imaz-Roncero C, et al.

The relationship between attention deficit/hyperactivity disorder (ADHD) and white matter connectivity has not been well established yet, specially for children under 10 years of age. In addition, the effects of treatment on brain structure have not been sufficiently explored from a Diffusion Tensor Imaging (DTI) perspective. In this study, the influence of treatment with methylphenidate in the white matter of children with ADHD was

investigated using two different and complementary DTI analysis methods: Tract-Based Spatial Statistics (TBSS) and a robust tractography selection method. No significant differences were found in Fractional Anisotropy (FA) between medicated, drug-naive patients and healthy controls, but a reduced Mean Diffusivity (MD) was found in ADHD patients under treatment with respect to both healthy controls and drug-naive ADHD patients. Also, correlations were found between MD increases and performance indicators of ADHD. These findings may help elucidate the nature of white matter alterations in ADHD, their relationship with symptoms and the effects of treatment with psychostimulants.

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Psychiatr Genet. 2015 Feb;25:26-30.

FAMILY-BASED ASSOCIATION STUDY OF THE ARSENITE METHYLTRANSFERASE GENE (AS3MT, RS11191454) IN KOREAN CHILDREN WITH ATTENTION-DEFICIT HYPERACTIVITY DISORDER.

Park S, Park JE, Yoo HJ, et al.

We examined the association between the selected polymorphisms in two candidate genes, the arsenite methyltransferase gene (AS3MT, rs11191454) and the inter-alpha-trypsin inhibitors heavy chain-3 gene (ITIH3, rs2535629), and attention-deficit hyperactivity disorder (ADHD) in a Korean population. A total of 238 patients with ADHD, along with both of their biological parents, were recruited. The children were administered intelligence quotient tests, whereas their parents completed the Child Behavior Checklist. In the transmission disequilibrium test on 181 trios, we found overtransmission of the A allele at the AS3MT rs11191454 polymorphism in children with ADHD (chi=8.81, P=0.003). However, there was no preferential transmission at the ITIH3 rs52535629 polymorphism (chi=0.14, P=0.707). Our results provide preliminary evidence for the overtransmission of the A allele at the AS3MT rs11191454 polymorphism in ADHD.

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Psychiatry Res. 2014;220:982-86.

DRD4 VNTRS, OBSERVED STRANGER FEAR IN PRESCHOOLERS AND LATER ADHD SYMPTOMS.

Pappa I, Mileva-Seitz VR, Szekely E, et al.

Fear of strangers is a developmental milestone in childhood that encompasses behavioral inhibition and decreased novelty seeking. Children with attention deficit/hyperactivity disorder (ADHD) often exhibit fearless and impulsive behaviors, similar to those observed in children with atypically low levels of stranger fear. It is currently unknown whether these behaviors share common underlying biological mechanisms. Polymorphisms in the dopamine receptor 4 gene (DRD4) have been implicated in the risk for developing ADHD symptoms in childhood. Here we investigate whether (1) DRD4 variable number tandem repeats (VNTRs) are associated with both stranger fear and ADHD symptoms, and (2) stranger fear in preschoolers mediates the link between DRD4 VNTRs and ADHD in later childhood. Stranger fear was observed in a large sample (N=589) of 3-year-old Caucasian children and ADHD symptoms were assessed by a validated, mother-rated questionnaire at 6 years. We found evidence that longer DRD4 variants were associated with increased ADHD symptoms at 6 years, and that this relationship was partially mediated by lower levels of observed stranger fear at 3 years. Our results suggest a common underlying neurobiological mechanism in the association between low stranger fear and ADHD symptoms; variation in DRD4 may be an important contributor to this mechanism.

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Psychiatry Res. 2015;225:122-28.

MULTI-DIMENSIONAL CORRELATES OF INTERNET ADDICTION SYMPTOMS IN ADOLESCENTS WITH ATTENTION-DEFICIT/HYPERACTIVITY DISORDER.

Chou W-J, Liu T-L, Yang P, et al.

This study examined the associations of the severity of Internet addiction symptoms with reinforcement sensitivity, family factors, Internet activities, and attention-deficit/hyperactivity disorder (ADHD) symptoms among adolescents in Taiwan diagnosed with ADHD. A total of 287 adolescents diagnosed with ADHD and aged between 11 and 18 years participated in this study. Their levels of Internet addiction symptoms, ADHD

symptoms, reinforcement sensitivity, family factors, and various Internet activities in which the participants engaged were assessed. The correlates of the severities of Internet addiction symptoms were determined using multiple regression analyses. The results indicated that low satisfaction with family relationships was the strongest factor predicting severe Internet addiction symptoms, followed by using instant messaging, watching movies, high Behavioral Approach System (BAS) fun seeking, and high Behavioral Inhibition System scores. Meanwhile, low paternal occupational SES, low BAS drive, and online gaming were also significantly associated with severe Internet addiction symptoms. Multiple factors are significantly associated with the severity of Internet addiction symptoms among adolescents with ADHD. Clinicians, educational professionals, and parents of adolescents with ADHD should monitor the Internet use of adolescents who exhibit the factors identified in this study.

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Psychiatry Res. 2015;225:164-68.

THE EFFECTS OF PRENATAL EXPOSURE TO ALCOHOL AND ENVIRONMENTAL TOBACCO SMOKE ON RISK FOR ADHD: A LARGE POPULATION-BASED STUDY.

Han J-Y, Kwon H-J, Ha M, et al.

Attention deficit hyperactivity disorder (ADHD) is caused by the interaction of genetic and environmental factors. The objective of this study was to examine the effects of prenatal exposure to alcohol and environmental tobacco smoke (ETS). Among the 30,552 parents who responded to a survey, the answers of 19,940 who replied to questions on prenatal exposure to ETS, alcohol consumption, and completed the DuPaul Rating Scale were analyzed. Results revealed that risk of ADHD significantly increased as a result of exposure to alcohol by 1.55 times (95% CI 1.33-1.82), maternal smoking during pregnancy by 2.64 times (95% CI 1.45-4.80), and paternal smoking during pregnancy by 1.17 times (95% CI 1.98-1.39). When the subjects whose mothers did not smoke during pregnancy were divided into 4 groups, the prevalence was 1.16 times higher (95% CI 1.02-1.33) in the group exposed to ETS but not alcohol, 1.19 times higher (95% CI 0.91-1.57) in the group exposed to alcohol but not ETS, and 1.58 times higher (95% CI 1.31-1.91) in the group exposed to ETS and alcohol. The differences between the groups were statistically significantly (P<0.0001). This result shows that simultaneous exposure to ETS and alcohol during pregnancy increases the risk of ADHD.

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Psychol Assess. 2014 Dec;26:1400-01.

"A DISPOSITIONAL FRAMEWORK ELUCIDATES DIFFERENCES BETWEEN INTERVIEW AND QUESTIONNAIRE MEASUREMENT OF CHILDHOOD ATTENTION PROBLEMS": CORRECTION TO HERZHOFF, TACKETT, AND MARTEL (2013).

Anon.

Reports an error in "A dispositional trait framework elucidates differences between interview and questionnaire measurement of childhood attention problems" by Kathrin Herzhoff, Jennifer L. Tackett and Michelle M. Martel (Psychological Assessment, 2013[Dec], Vol 25[4], 1079-1090). In the article, the Child Behavior Checklist Attention Problem (AP) scale was scored incorrectly. Correcting this error did not change the interpretation of the results, but did change the numbers in the table and text and resulted in Table 5 not being a suitable reference for the text on page 1087 in the discussion section that describes the relationship between the AP scale and the lower-order facet Fear. That reference should now include only Table 2, and not Table 5. The revised column from Table 2 presented in the erratum reports the results with the correctly scored AP scale. A summary of the revised Tables 1, 3, 4, 5, and 6 is also provided. There is also an error in the text on page 1081 in the methods section that describes the scoring of the CBCL. The corrected text is provided in the erratum. (The following abstract of the original article appeared in record 2013-19092-001.) At present, no single attention-deficit/hyperactivity disorder (ADHD) measure completely and comprehensively captures all ADHD diagnostic criteria (Anastopoulos, 2001). This represents a notable limitation in the assessment of attention problems and suggests the need for research that reconciles differences in information across measures purporting to measure the same or similar constructs. For example, by analyzing differences in measures in relation to a third construct, the third construct can provide an illuminative backdrop against which to view and ultimately reconcile differences between measures of the same attention problem construct. Thus, the purpose of the present study

was to draw on a dispositional trait framework to illustrate differences in the ADHD construct assessed by 2 widely used attention problem measures. Parents of 346 children (51% girls) ranging in age from 7 to 12 years (M = 9.92 years, SD = 0.83 years) completed the Child Behavior Checklist (CBCL; Achenbach & Rescorla, 2001), a structured clinical interview based on the Diagnostic and Statistical Manual of Mental Disorders (4th ed., text rev.; DSM-IV-TR; American Psychiatric Association, 2000), and dispositional trait questionnaires about their child. Both low Conscientiousness/Effortful Control and high Neuroticism/Negative Affect showed strong, unique associations with the CBCL Attention Problem score, whereas only low Conscientiousness/Effortful Control showed a strong, unique association with DSM-IV-TR ADHD symptoms assessed by clinical interview. These discriminant dispositional trait correlates help us understand the nature of the attention problem construct as assessed by each measure, with important implications for the practice of cross-measure integration in both research and applied settings.

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Res Dev Disabil. 2014 Dec;35:3236-44.

PATHOLOGICAL DEMAND AVOIDANCE IN A POPULATION-BASED COHORT OF CHILDREN WITH EPILEPSY: FOUR CASE STUDIES.

Reilly C, Atkinson P, Menlove L, et al.

Childhood epilepsy is associated with a range of neurobehavioural comorbidities including Attention-Deficit/Hyperactivity Disorder (ADHD), Autism Spectrum Disorder (ASD), motor impairments and emotional problems. These difficulties frequently have a greater impact on quality of life than seizures. Pathological Demand Avoidance (PDA) is a term increasingly in use in the UK and Europe to describe behaviours associated with an extreme resistance to demands and requests and the need to be in control in social interactions. In a population-based group of 85 children with epilepsy, four (5%) were identified as displaying significant symptoms of PDA, were assessed using the Extreme Demand Avoidance Questionnaire (EDA-Q) and are described in detail. As well as significant symptoms of PDA, the four children met criteria for a range of neurobehavioural disorders; all four had cognitive impairment (IQ<85) and met DSM-IV-TR criteria for ADHD. Three, in addition, met criteria for ASD and Developmental Coordination Disorder (DCD) and two for Oppositional Defiant Disorder (ODD). All four experienced their first seizure before 5 years of age. School and parent reports indicated very significant functional impairment and management concerns, particularly with respect to complying with everyday demands. Symptoms of PDA should be considered when evaluating neurobehavioural comorbidity in childhood epilepsy.

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Res Dev Disabil. 2015 Jan;38C:181-91.

EFFECTS OF PHYSICAL ACTIVITY ON EXECUTIVE FUNCTION AND MOTOR PERFORMANCE IN CHILDREN WITH ADHD.

Ziereis S, Jansen P.

Children with Attention-Deficit/Hyperactivity Disorder (ADHD) often show major deficits in motor and cognitive abilities. Pharmacological treatment is commonly used to reduce ADHD symptoms. However, non-pharmacologic treatment methods would be preferred by parents, children and psychiatrists. Physical activity (PA) has been demonstrated to improve cognitive functioning in healthy populations. It can be hypothesized that there are similar beneficial effects in children with ADHD, however, very little is known about this issue. The purpose of the present study was to determine whether PA improves cognitive performance in children with ADHD. A total of 43 children with ADHD (32 boys and 11 girls) aged between seven and 12 years took part in the study. To investigate whether potential effects on executive functioning depend on the kind of PA, two different 12-week training programs were implemented. The study-design consisted of two experimental groups (EG1, n=13; EG2, n=14) and a wait-list control group (CG, n=16). Participants in EG1 took part in a training which focused on the abilities ball handling, balance and manual dexterity. Participants in EG2 group were trained in sports without a specific focus. The children in the CG group received no intervention. Participants completed assessments of working memory (WM) and motor performance before, immediately after the first training week and one week after the last session. After the 12-week intervention period, several measures of the EG1 and EG2s significantly improved over time. Furthermore, between group comparisons demonstrated

significant improvements in both EG1 and EG2 compared to the CG in variables assessing WM performance and motor performance. These findings support the hypothesis that long-term PA has a positive effect on executive functions of children with ADHD, regardless of the specificity of the PA. The outcomes indicated that regular PA can be used as a complementary or alternative non-pharmacologic treatment for ADHD.

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Res Autism Spectr Disord. 2015;10:1-6.

AUTISTIC SPECTRUM DISORDER, ATTENTION DEFICIT HYPERACTIVITY DISORDER, AND PSYCHIATRIC COMORBIDITIES: A NATIONWIDE STUDY.

Chen M-H, Wei H-T, Chen L-C, et al.

Attention deficit hyperactivity disorder (ADHD) and autism spectrum disorder (ASD) are both frequently comorbid with other psychiatric disorders, but the comorbid effect of ASD and ADHD relative to the comorbid risk of other psychiatric disorders is still unknown. Using the Taiwan National Health Insurance Research Database, 725 patients with ASD-alone, 5694 with ADHD-alone, 466 with ASD + ADHD, and 27,540 (1:4) age-/gender-matched controls were enrolled in our study. The risk of psychiatric comorbidities was investigated. The ADHD + ASD group had the greatest risk of developing schizophrenia (hazard ratio [HR]: 95.89; HR: 13.73; HR: 174.61), bipolar disorder (HR: 74.93; HR: 19.42; HR: 36.71), depressive disorder (HR: 17.66; HR: 12.29; HR: 9.05), anxiety disorder (HR: 49.49; HR: 50.92; HR: 14.12), disruptive behavior disorder (HR: 113.89; HR: 93.87; HR: 26.50), and tic disorder (HR: 8.95; HR: 7.46; HR: 4.87) compared to the ADHD-alone, ASD-alone, and control groups. Patients with ADHD + ASD were associated with the greatest risk of having comorbid bipolar disorder, depressive disorder, anxiety disorder, disruptive behavior disorder, and tic disorder. The diagnoses of ASD and ADHD preceded the diagnoses of other psychiatric comorbidities. A comprehensive interview scrutinizing the psychiatric comorbidities would be suggested when encountering and following patients with both ASD and ADHD in clinical practice.

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Rev Psiquiatr Clin. 2014;41:124-30.

QUANTITATIVE MEASUREMENT OF IMPAIRMENT IN ADHD: PERSPECTIVES FOR RESEARCH AND CLINICAL PRACTICE.

Fortes D, Serra-Pinheiro MA, Coutinho G, et al.

Background: Functional impairment is needed to make an attention deficit hyperactivity disorder (ADHD) diagnosis, but there is a paucity of instruments addressing this issue.

Objective: Perform psychometric analysis of a functional impairment scale (FIE).

Methods: A sample of 320 individuals, including ADHD probands, their siblings and parents, filled the FIE. We analyzed psychometric properties for the entire sample and age groups. Factor structure was determined by a principal component factor analysis, using oblique rotation with Kaiser normalization and Eigenvalues higher than 1. Cronbachnulls alpha and Spearman- Brown were calculated.

Results: Family analysis revealed four components: a) nullfamily lifenull, b) nullself-perceptionnull, c) nullperformancenull and d) nullsocial lifenull. Adultsnull analysis revealed two components: a) nullfamily life, social life and self-perceptionnull and b) nullperformancenull. Children showed the domains: a) nullperformance and social lifenull, b) nullself-perceptionnull and c) nullfamily lifenull components. Cronbachnulls alpha were above 0.9 in all components.

Discussion: Results revealed up to four domains depending on the group considered. Different life demands might explain the variability of domains on the groups.

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Ricerca e Pratica. 2014;30:198-211.

TWO-YEARS OF ACTIVITY OF THE LOMBARDY REGION'S ADHD REGISTRY: AN ANALYSIS OF THE DIAGNOSTIC AND THERAPEUTIC PATHWAYS OF CARE.

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

Results: In all, 753 of 1150 (65%) suspected patients received a diagnosis of ADHD (M:F=6:1; median age 9yr; range: 5-17yr). In 24% of cases there was a family history of ADHD. A total of 483 (65%) patients had at least one psychopathological disorder, the most frequent of which were learning disorders (35%), sleep disturbances (14%), and oppositional defiant disorder (13%), while 69 (9%) had other chronic medical conditions, most of which were neurological diseases (n=28). In all, 85% of patients received a prescription for a psychological type of intervention, involving mostly parent training (428 patients, 82%), child training (308, 59%), and teacher training (173, 33%), while 2% received prescriptions for drugs alone, and 13% a combination of both. Of the 115 patients receiving drug therapy, 95 (83%) were treated with meihylphenidate (5-40 mg/day), 5 of whom in combination with other psychotropic drugs, 7% (n=8) with atomoxetine (10-75 mg/day), and the remaining 10% (n=12) with another drug especially risperidone. Compared to subjects treated with psychological interventions alone, patients with drug prescriptions more commonly presented values of CGI-S of 5 or higher (p<0.0001), lower cognitive levels (p=0.0019), and the presence of associated disorders, such as oppositional defiant disorder (p<0.0001) and sleep disturbances (p=0.0007)

Conclusions: The registry represents an essential tool for continuous, systematic monitoring and has permitted the planning and appropriate use of resources based on actual needs, leading to significant, progressive improvements in clinical practice and ensuring an efficient and homogeneous quality of care

Aim: To evaluate the prevalence rate and the diagnostic and therapeutic pathways of care of ADHD patients in the Lombardy Region

Methods: Data on patients evaluated by the 18 ADHD Regional Reference Centres in the 2012-2013 period were analysed in order to describe the diagnostic and therapeutic characteristics of the sample.

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Scand J Psychol. 2014 Dec;55:538-45.

ASSESSING THE EFFECTIVENESS OF THE 'INCREDIBLE YEARS((R)) PARENT TRAINING' TO PARENTS OF YOUNG CHILDREN WITH ADHD SYMPTOMS - A PRELIMINARY REPORT.

Trillingsgaard T, Trillingsgaard A, Webster-Stratton C.

This study examined the effectiveness of an evidence-based parent training program in a real-world Scandinavian setting. Parents of 36 young children with or at risk of Attention Deficit Hyperactive Disorder (ADHD) self-referred to participate in the Incredible Years((R)) Parent Training Program (IYPT) through a Danish early intervention clinic. Using a benchmarking approach, we compared self-report data with data from a recent efficacy study. Eight out of nine outcome measures showed comparable or higher magnitude of effect from pretest to posttest. Effects were maintained or improved across six months. The methodology of this study exemplifies a rigorous but feasible approach to assessing effectiveness when evidence-based US protocols are transferred into the existing Scandinavian service delivery. Findings suggest that IYPT can be implemented successfully as an easy-access early intervention to families of children with or at risk of ADHD.

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World J Biol Psychiatry. 2014 Dec;1-10.

STRUCTURAL CORRELATES OF COMT VAL158MET POLYMORPHISM IN CHILDHOOD ADHD: A VOXEL-BASED MORPHOMETRY STUDY.

Villemonteix T, De Brito SA, Slama H, et al.

Objectives. The Val158-allele of the catechol-O-methyltransferase (COMT) Val158Met (rs4680) functional polymorphism has been identified as a risk factor for antisocial behaviour in attention-deficit/hyperactivity disorder (ADHD). Here, we used voxel-based morphometry to investigate the effects of Val158Met polymorphism on grey matter (GM) volumes in a sample of 7-13-year-old children.

Methods. MRI and genotype data were obtained for 38 children with combined-type ADHD and 24 typically developing (TD) children. Four regions of interest were identified: striatum, cerebellum, temporal lobe and inferior frontal gyrus (IFG).
Results. When compared to TD children, those with ADHD had a significant decrease of GM volume in the IFG. Volume in this region was negatively correlated with ratings of hyperactivity/impulsivity symptoms. Furthermore, the smaller GM volume in the IFG was attributed to the presence of the Met158-allele, as only children with ADHD carrying a Met158-allele exhibited such decrease in the IFG. Children with ADHD homozygotes for the Val158-allele presented increased GM volume in the caudate nucleus when compared with TD children.
Conclusions. This study provides the first evidence of a modulation of ADHD-related GM volume alterations by Val158Met in two key regions, possibly mediating the relationship between Val158Met polymorphism and antisocial behaviour in children with ADHD.

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World J Biol Psychiatry. 2014;15:609-19.

IN A RANDOMIZED CASE-CONTROL TRIAL WITH 10-YEARS OLDS SUFFERING FROM ATTENTION DEFICIT/HYPERACTIVITY DISORDER (ADHD) SLEEP AND PSYCHOLOGICAL FUNCTIONING IMPROVED DURING A 12-WEEK SLEEP-TRAINING PROGRAM.

Keshavarzi Z, Bajoghli H, Mohamadi MR, et al.

Objectives. We tested the hypothesis that sleep training would improve emotional, social and behavioural functioning in children with attention-deficit/hyperactivity disorder (ADHD) compared to children with ADHD without such intervention and to healthy controls.
Methods. Forty children with ADHD were randomly assigned to intervention and control conditions. Parents of 20 children with ADHD were instructed and thoroughly supervised in improving their children's sleep schedules and sleep behaviour. Parents of the other 20 children with ADHD and parents of 20 healthy children received general information about sleep hygiene. At baseline and 12 weeks later, parents and children completed questionnaires related to children's sleep and psychological functioning.
Results. Relative to the control groups, children in the intervention group improved sleep quantitatively and qualitatively (F values < 3.33, P values < 0.05). The intervention group children reported improvements in mood, emotions, and relationships (F values < 2.99, P values < 0.05). Parents reported that their children improved in physical and psychological wellbeing, mood, emotions, relationships, and social acceptance (F values < 3.02, P values < 0.05).
Conclusions. Training and monitoring parents of children with ADHD in regulating and supervising children's sleep schedules leads to positive changes in the emotions, behaviour and social lives of these children.

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Z Psych Psychol Psychother. 2014;63:47-52.

TRAUMA EXPERIENCE AND CHILD ABUSE IN ADHD PATIENTS.

Retz-Junginger P, Arweiler A, Retz W.

Childhood traumatisation is frequently caused by sexual abuse. Goal of our study was the qualitative and quantitative analysis of childhood traumatisation in ADHD patients. We examined 125 adults with childhood ADHD and 195 controls. Traumatic experiences, including sexual abuse, were assessed by standardized questionnaires. ADHD subjects showed significant higher rates in emotional abuse, physical abuse, sexual abuse, emotional neglect, and physical neglect according to CTQ-subscales as compared to controls. ADHD persons described both more hands-on- and hands-off sexual abuse in childhood. Moreover, ADHD subjects who reported sexual abuse described significant more anxious and depressive symptoms in childhood than non-abused ADHD subjects. Our results suggest a higher risk for ADHD children to become a victim of sexual abuse. Therefore preventive work might be required and therapy should pay attention to potential traumatisation in ADHD patients.

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Cortese et al. BMC Psychiatry 2013, 13:286
http://www.biomedcentral.com/1471-244X/13/286

BMC Psychiatry

DEBATE Open Access

Attention-deficit/hyperactivity disorder and impairment in executive functions: a barrier to weight loss in individuals with obesity?

Samuele Cortese[1,2,7*], Erika Comencini[1], Brenda Vincenzi[3], Mario Speranza[4,5] and Marco Angriman[6]

Abstract

Background: An increasing body of research points to a significant association of obesity to Attention-Deficit/Hyperactivity Disorder (ADHD) and deficits in executive functions. There is also preliminary evidence suggesting that children with ADHD may be at risk of obesity in adulthood.

Discussion: In this article, we discuss the evidence showing that ADHD and/or deficits in executive functions are a barrier to a successful weight control in individuals enrolled in weight loss programs. Impairing symptoms of ADHD or deficits in executive functions may foster dysregulated eating behaviors, such as binge eating, emotionally-induced eating or eating in the absence of hunger, which, in turn, may contribute to unsuccessful weight loss. ADHD-related behaviors or neurocognitive impairment may also hamper a regular and structured physical activity. There is initial research showing that treatment of comorbid ADHD and executive functions training significantly improve the outcome of obesity in individuals with comorbid ADHD or impairment in executive functions.

Summary: Preliminary evidence suggests that comorbid ADHD and deficits in executive functions are a barrier to a successful weight loss in individuals involved in obesity treatment programs. If further methodologically sound evidence confirms this relationship, screening and effectively managing comorbid ADHD and/or executive functions deficits in individuals with obesity might have the potential to reduce not only the burden of ADHD but also the obesity epidemics.

Keywords: ADHD, Executive functions, Obesity, Treatment resistance

Background

Attention-Deficit/Hyperactivity Disorder (ADHD) is defined by persistent, age inappropriate and impairing levels of inattention and/or hyperactivity-impulsivity [1]. The Diagnostic and Statistical Manual of Mental Disorders-4th edition, Text Revision, IV-TR [1] defines four types of ADHD: "predominantly inattentive", "predominantly hyperactive-impulsive", "combined", and "not otherwise specified". Although outside the scope of this article, since the final text is not yet available, we note that the core structure of the diagnostic criteria is largely unchanged in the forthcoming fifth edition of the diagnostic manual.

ADHD is one of the most frequent childhood-onset psychiatric conditions, with an estimated worldwide-pooled prevalence exceeding 5% in school-age children [2]. Impairing symptoms of ADHD persist into adulthood in up to 65% of childhood-onset cases [3] and the pooled prevalence of ADHD in adults has been estimated at ~2.5% [4].

Executive functions are defined as a set of neurocognitive skills that are necessary to plan, monitor and execute a sequence of goal-directed complex actions and include inhibition, working memory, planning, and sustained attention [5]. Besides the behavioural core symptoms of inattention, hyperactivity, and impulsivity, deficits in executive functions are commonly, although not universally, associated with ADHD [6]. Indeed, executive dysfunction is not required for the diagnosis of ADHD, which

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Cortese et al. BMC Psychiatry 2013, 13:286
http://www.biomedcentral.com/1471-244X/13/286

is defined at the behavioral, rather than neuropsychological, level. Additionally, ADHD is usually comorbid with other neurodevelopmental and/or psychiatric conditions, such as learning disorders, oppositional defiant/conduct disorder, mood and anxiety disorders, substance use disorders, and sleep disturbances [7,8].

Currently, the mainstay of treatment, at least for severe cases, is pharmacologic, with psychostimulant medications (methylphenidate and amphetamines) as the first line, and non-stimulants as secondary option [6,9]. Non-pharmacological treatments, such as behavioural therapies, diet regimens, cognitive training, and neurofeedback, are also available. Although the empirical evidence for their efficacy for ADHD core symptoms is so far weak [10], such treatments may effectively address related behavioural or neuropsychological dysfunctions.

Because of its core symptoms as well as associated disorders/conditions, ADHD entails an enormous burden on society in terms of psychological dysfunction, adverse vocational outcomes, stress on families, and societal financial costs. The U.S. annual incremental costs of ADHD have been recently estimated at $143-$266 billion [11] and high costs have been reported in other countries as well (e.g., [12]).

Whereas the comorbidity between ADHD and psychiatric disorders has been extensively explored [7], the association with general medical conditions has received much less attention. However, among medical disorders, there is increasing evidence pointing to a significant association between overweight/obesity and ADHD in children [13,14] as well as in adults [15-17]. In particular, as detailed in a previous systematic review [18] and outlined in Table 1, all currently available studies show significantly higher rates of ADHD in individuals with obesity treated in specialized centres compared to normal weight controls or population rates of ADHD. (Studies listed in Table 1 were retrieved searching Pubmed, Ovid, EMBASE, and Web of Knowledge, from their inception to March 15th, 2013, using the following keywords, in multiple combination combination: *obesity, BMI, weight, body mass, ADHD, Attention-Deficit/Hyperactivity Disorder, Attention Deficit Disorder, Hyperkinetic Disorder*; details of the search strategy and syntax, adapted for each database, as well as of the specific results from each database search, are available from the corresponding author). Given the cross-sectional design of such studies, they cannot allow to infer the causal relationship between obesity and ADHD. Theoretically, it is possible that: 1) ADHD contributes to weight gain; 2) Obesity early in life fosters symptoms of ADHD; 3) Both conditions are the expression of underlying neurobiological and psychopathological dysfunctions. Recent studies have shaded light on the causal relationship between ADHD and obesity, supporting in part the notion that ADHD in childhood may contribute to weight gain later on in life. Cortese et al. [19] assessed body mass index (BMI) and obesity rates in a sample of 111 U.S. adults with childhood problems consistent with DSM-IV(-TR) ADHD, combined type, followed up for

Table 1 Studies assessing the rates of Attention-Deficit/Hyperactivity Disorder (ADHD) in clinical samples of treatment-seeking individuals with obesity

First author (year) [ref]	Sample characteristics	Key findings
Altfas (2004) [21]	215 patients with obesity treated in a specialized obesity clinic (Males: 22; mean age: 43.4 ± 10.9 years)	Prevalence of ADHD in the whole sample: 27.4%. Prevalence of ADHD in individuals with BMI ≥ 40 kg/m^2: 42.6%. Mean BMI loss among patients with ADHD: 2.6 BMI (kg/m^2) *vs.* 4.0 for non-ADHD ($p < 0.002$)
Erermis (2004) [22]	30 adolescents with obesity (Males: 14; mean age: 13.8 ± 1.2 years) seeking treatment in a paediatric endocrinology outpatient clinic	Prevalence of ADHD: 13.3%
Agranat-Meged (2005) [23]	26 adolescents in a tertiary referral centre for obesity (Males: 13; mean age: 13.04 ± 2.8 years), all with morbid obesity (BMI > 95 percentile)	57.7% of the subjects presented with ADHD diagnosed with semi-structured interviews
Fleming (2005) [24]	75 women with severe obesity (BMI ≥ 35 kg/m^2) (mean age: 40.4 ± 7.25 years) referred for non surgical treatment of obesity	26.7% of women reported impairing symptoms of ADHD in both childhood and adulthood
Alfonsson (2012) [25]	187 individuals (Males: 50; mean age: 44.28 ± 6.02 years) with obesity, candidate for bariatric surgery	10% of the subjects presented with ADHD. ADHD symptoms significantly correlated with anxiety, depression, and disordered eating ("lack of control over eating", "eating alone because embarrassed", "eating until feeling uncomfortable", and "feeling guilty after overeating")
Gruss (2012) [26]	116 patients (Males: 31; mean age: 44.28 ± 6.02 years) candidate for bariatric surgery	12% of the patients screened positive for ADHD. Rates of Binge Eating disorder did not differ between patients with and without ADHD
Nazar (2012) [27]	150 women (mean age: 38.9 ± years)	Prevalence of ADHD: 28.3%. ADHD was significantly correlated with more severe binge eating, bulimic behaviors, and depressive symptoms severity

Cortese et al. BMC Psychiatry 2013, 13:286
http://www.biomedcentral.com/1471-244X/13/286

33 years, and matched comparisons (N = 111) without childhood ADHD. They found that BMI and obesity rates were significantly higher in individuals with childhood ADHD *vs.* non ADHD comparisons (41.4% vs. 21.6%, respectively), even after controlling for possible confounders such as socio-economic status (SES) and comorbid psychiatric disorders associated with obesity, i.e., mood, anxiety, and substance use disorders. However, anthropometric data were not collected in childhood, which prevented the authors from determining whether the association between childhood ADHD and weight status at follow-up in adulthood was attributable to weight status in childhood or whether it developed later. Using a dimensional approach (i.e., considering the intensity of each ADHD symptom) rather than a categorical approach based on the DSM-IV-TR nosography, Fuemmelar et al. [16] found a significant linear relationship between the number of retrospectively reported symptoms of inattention or hyperactivity/impulsivity in childhood and adulthood BMI in a population based sample of 15,197 individuals (National Longitudinal Study of Adolescent Health). Extending such evidence, Cortese et al. [20] analyzed a sample of 34,653 U.S. adults from the National Epidemiologic Survey on Alcohol and Related Conditions and found a significant association between the number of symptoms of inattention, hyperactivity, or impulsivity (retrospectively reported) in childhood and obesity in adulthood. However, after controlling for SES and an extensive set of psychiatric disorders, the association held only in women, thus calling for future studies taking into account possible gender differences. The retrospective report of ADHD symptoms is a limitation of this study.

With regards to executive dysfunctions, there is an emerging literature indicating their possible association with overweigh/obesity. In a recent systematic review [28] including 31 papers limited to children and adolescents, Reinert and colleagues concluded that inhibitory control, assessed with several neuropsychological tests, was the most consistently impaired executive function across studies. About 77% of the retained studies in children and 73% of the papers relative to adolescents with obesity reported a significant impairment in this executive function. Additionally, scores on neuropsychological tests assessing inhibitory control were significantly lower ($p < 0.01$) in children with obesity than in normal weight comparisons, when pooling data across studies. Another recent systematic review [29] considering individuals across the lifespan and using a different approach in the selection of the papers, showed that decision making, planning and problem solving were the most compromised domains, although the authors note the high heterogeneity across studies in the methodology and in the selection of the neuropsychological tests.

Summarizing, there is increasing evidence that both ADHD, at least considering samples of treatment-seeking individuals, and deficits in executive functions, even in the absence of a formal diagnosis of ADHD, may be associated with obesity. Additionally, there is preliminary evidence that ADHD may causally contribute to obesity/overweight. However, an important aspect to note is that the impact of ADHD or executive dysfunction on obesity outcome is still underexplored. In the next section, we discuss the preliminary evidence showing that ADHD or executive dysfunction may represent an important barrier to successful weight loss in patients with obesity during weight loss programs. We also point out the clinical implications of these findings, as well as possible future research directions in this emerging area of investigation.

Discussion

Several possible dysfunctional behavioural pathways associated with either ADHD (as a categorical diagnosis) or related neuropsychological deficits in executive functions lead to hypothesize that impairing symptoms of impulsivity, inattention or hyperactivity (the behavioural core symptoms of ADHD) and/or related neurocognitive impairment may be a barrier to successful weight loss during treatment interventions for individuals with obesity.

First, it is possible that impulsivity and deficient neurocognitive inhibitory control foster impulsive and dysregulated eating behaviors, which, in turn, would hamper the success of dietetic regimen. These abnormal eating behaviors include binge eating, "external eating" (i.e., eating in response to food-related stimuli, regardless of the internal state of hunger or satiety) and "emotionally-induced eating" (i.e., excessive eating as a response to emotional states), all of which have been related to obesity and overweight [30,31].

Second, another dysfunction related to impulsivity and deficits in inhibitory control, namely altered reward sensitivity, may also contribute to dysregulated eating behaviors. Indeed, a subset of individuals with ADHD present with a preference for small immediate over larger delayed rewards [29,32]. This could therefore hamper dietetic efforts when considering eating-related rewards deriving from appetizing foods.

Third, it has been noted that attention and related executive functions such as planning and organizational skills are important for a successful adhesion to dietetic regimen and regular physical exercise [18], both of which underpin effective and sustained weight control.

The previous hypotheses of a correlation between ADHD symptoms and/or executive function deficits and abnormal eating start being supported by empirical evidence. With regards to ADHD symptoms, Cortese et al. [33] found a significant correlation between

Cortese et al. BMC Psychiatry 2013, 13:286
http://www.biomedcentral.com/1471-244X/13/286

inattentive and impulsive ADHD symptoms and binge eating behaviors, even after controlling for comorbid depression and anxiety, in a study of 99 consecutively referred severe obese adolescents (12-17 years). By means of structural equation modelling, Davis et al. [30] found a significant correlation between ADHD symptoms and abnormal eating behaviors (including binge eating and emotionally-induced eating) in a sample of healthy adult women (25-46 years). Using the same modelling, Strimas et al. [34] confirmed these results also in a sample of 145 non-clinical adult males.

There is also evidence that deficit in executive dysfunctions are related to abnormal eating behaviors, although causal relationship has not been tested. For example, in a study of 55 women reporting weekly binge eating in the absence of regular compensatory behaviors, Kelly et al. [35] found a significant correlation between frequency of binge eating behaviors and deficit in executive functions such as flexibility in thinking and shifting attention. By means of path analyses, Dempsey et al. [36] confirmed a significant correlation between deficit in executive functions and overeating behaviors in a sample of 135 individuals from the community. This evidence has been extended to young children. Pieper and Laugero [37] recently reported a significant correlation between executive function deficits, measured by means of child-completed tasks and parental as well as teacher reports, and eating in the absence of hunger in a sample of 29 preschool children (3-6 years).

While the correlation of impulsivity and inattention domains to abnormal eating behaviors associated with obesity may be intuitive, one could think that the hyperactive component of ADHD is not involved at all and, actually, it may favour weight loss rather than weight gain. However, it is well known that the motor hyperactivity of ADHD is not constant. Actigraphic measures have shown that motor hyperactivity is modulated by situational variables and may be indistinguishable from normal when there is sufficient stimulation. For example, no significant differences in hyperactivity levels between children with ADHD and healthy comparisons have been detected while watching television, whereas children with ADHD show significantly more hyperactivity during classes at school [38]; it is important to note that children with ADHD have also been shown to watch more television than non ADHD children. Interestingly, psychostimulant medications induce an increase, rather than a decrease, and a normalization of motor activity during physical education, where movement is appropriate and expected [38]. It is also possible that excessive motor activity in the morning during breakfast hampers a correct consumption of breakfast; in turn, skipping breakfast has been shown as a risk factor for weight gain and obesity [39]. Additionally, restlessness during lunch and dinner may decrease regular food consumption during these structured moments, with inappropriate and excessive compensatory calories intake outside meals. Therefore, we hypothesize that the balance between the tendency to overeat in an irregular way following irregular breakfast and meals, from one side, and the inconstant energy expenditure associated with motor hyperactivity in ADHD, on the other side, may explain why ADHD hyperactivity contributes to increase the risk of obesity.

So, if ADHD or related executive functions deficits foster abnormal eating behaviors contributing to obesity, is there evidence supporting that ADHD and executive dysfunction also represent a barrier to effective and lasting weight loss in individuals with obesity? This starts being reported in the literature, although further and more methodologically sound evidence is needed.

In an observational study of 215 adults with obesity in a specialized clinics, Altfas [21] was the first to note that those without comorbid ADHD achieved nearly twice the BMI loss compared to patients with comorbid ADHD, despite the fact that the latter engaged in more visits, thus suggesting a pattern of "taking more time to accomplish less" associated with ADHD. Afterwards, in a study of adults involved in a behavioral weight loss program, Pagoto et al. [40] confirmed that participants with ADHD reported more previous weight loss attempts and lost less weight than those who did not screen positive for ADHD. Another recent study showed that patients presenting for bariatric surgery (BS) with comorbid ADHD had significantly more difficulties in following visits after BS than those without comorbid ADHD [41].

Indirect support to the hypothesis that executive function deficit is a barrier to effective weight control is also provided by a longitudinal prospective study by Speranza et al. [42] who found that alexithymia was a significant predictor of treatment outcome at 3-year follow-up in a sample of youths with eating disorder. Indeed, alexithymia is related to executive function deficits, as summarized in [43].

Given this preliminary literature, a crucial question is whether treatment of ADHD and/or improvement in executive functions are also effective in decreasing/preventing obesity in children with both conditions. There is initial evidence indicating that the answer may be affirmative.

In a study [44] of 242 individuals with a lengthy history of weight loss failure consecutively referred for refractory obesity, 78 patients (32.2%) screened positive for ADHD. Of these, 65 started pharmacotherapy for ADHD with psychostimulants, in addition to standard management for weight loss, and were followed up for an average of 466 days. Those who refused pharmacological treatment or who did not tolerate it for adverse events (n = 13) were

Cortese et al. BMC Psychiatry 2013, 13:286
http://www.biomedcentral.com/1471-244X/13/286

also followed up, serving as comparisons, and received standard care for weight loss management. At follow-up, individuals who received treatment lost 12.36% of their initial weight, whereas comparisons gained an average of 2.78% ($p < 0.001$). A putative confounder in interpreting these results is the possible anorexigenic effect that may be associated with psychostimulant treatment. However, appetite reduction was evident in the first 4–6 weeks of treatment, but then it diminished and vanished in most of the subjects within 2 months. Therefore, the authors of the study concluded that it is unlikely that the anorexigenic effect of psychostimulants contributed to the weight loss at follow-up, after more than one year from the start of the treatment. A limitation of this study is its design: although the study was controlled, it was not randomized. Indeed, since the pharmacological treatment for ADHD is effective and is recommended in several guidelines, [6,9], for ethical reason it was not possible to randomize participants either to pharmacological treatment or placebo. As such, this study cannot provide high-level evidence. Although a randomized study testing the effects on weight of psychostimulants for ADHD would be challenging, interestingly, there is preliminary evidence from a randomized trial [45] suggesting that the training of executive functions is highly effective to improve the outcome of obesity. In this trial, Verbeken and coworkers assessed the effects of executive functions training with video games aimed at improving inhibitory control and working memory. They randomized 44 children (8-14 years) who were in the final part of a 10- month inpatients treatment program in an obesity centre to either 6-week executive functions training or to standard care for weight control. At 8 weeks after the training, children in the training group showed significantly better weight loss maintenance than those in the standard care group.

Clinical implications

If further methodologically sound studies confirm that ADHD and/or related executive functions deficits are a barrier to effective weight loss, it would be worthy for the clinicians and professionals involved in the management of obesity to screen for ADHD and impairment in executive functions. We note that professionals involved in the treatment of obesity usually do not have an appropriate knowledge of ADHD and related disorders. A systematic screening and appropriate treatment of ADHD and/or executive functions deficits might not only reduce the burden of ADHD, but also improve the outcome of patients with a past history of weight loss failure. This is particularly relevant in terms of decreasing the stigma associated with obesity. Unfortunately, a common belief manifested not only by the lay public but also by some professionals is that individuals with obesity may fail to succeed at weight-loss programs due to their "laziness" [46]. Inattention and related impaired executive functions, as well as impulsivity that hamper the appropriate adherence to a regular diet regimen, might be mistakenly attributed to laziness and "character problems". Therefore, awareness that unsuccessful weight loss may be due, at least in part, to neurocognitive impairment could contribute to decrease the stigma associated with obesity.

Future research in the field

We believe that the relationship between ADHD/executive functions and obesity, as well as the impact of neurocognitive impairment on weight loss management, is still in a developing phase. While the cross-sectional relationship between ADHD and obesity starts being well characterized from a clinical descriptive standpoint, further longitudinal studies are needed to better assess the causal relationship. Studies aimed at elucidating common neurobiological and genetics underpinnings are still in their infancy (e.g., [47]) and need further attention. Perhaps even more important in terms of implementation science would be to assess, by means of rigorous randomized controlled trials, the effects of ADHD treatment or executive functions training on weight outcome in individuals enrolled in weight loss programs. In particular, it would be highly relevant to establish if early management of ADHD in young children leads to further better obesity outcome later on. However, given the challenges, from an ethical standpoint, of conducting long-term randomized controlled trials where participants are assigned either to an effective treatment for ADHD or to placebo, longitudinal studies comparing the weight outcome of obese children treated with ADHD medications vs those who opt for non pharmacological approaches or no treatment, matched for baseline BMI and socio economic status, could provide useful data. This design will likely require multi-center recruitment. Research in such area is worthy and could contribute to decrease the worldwide obesity epidemics.

Summary

Preliminary evidence suggests that comorbid ADHD and deficits in executive functions are a barrier to a successful weight loss in individuals involved in obesity treatment programs. If further methodologically sound evidence confirms this relationship, screening and effectively managing comorbid ADHD and/or executive functions deficits in individuals with obesity might have the potential to reduce not only the burden of ADHD but also the obesity epidemics.

Abbreviations

ADHD: Attention-Deficit/Hyperactivity Disorder; BMI: Body mass index; SES: Socioeconomic status.

Competing interests

Dr. Cortese has received financial support to attend medical meetings from Eli Lilly & Company (2008) and Shire Pharmaceuticals (2009-2010), and has

been co-investigator in studies sponsored by GlaxoSmithKline (2007), Eli Lilly & Company (2008), and Genopharm (2009). He has served as scientific consultant for Shire Pharmaceuticals (2009-2010). Drs. Comencini, Vincenzi, Speranza, and Angriman declare no competing conflict of interest.

Authors' contributions
Dr. Cortese conceived and drafter the manuscript and approved the final version to be submitted; Drs. Comencini, Vincenzi, Speranza, and Angriman critically revised the first draft, contributed to the literature search, and approved the final version to be submitted. All authors read and approved the final manuscript.

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Acknowledgments
Dr. Cortese was supported by a "Marie Curie" grant for Career Development, International Outgoing Fellowship, PIOF-253103 from the European Commission.

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Received: 31 March 2013 Accepted: 15 July 2013
Published: 7 November 2013

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doi:10.1186/1471-244X-13-286
Cite this article as: Cortese *et al.*: Attention-deficit/hyperactivity disorder and impairment in executive functions: a barrier to weight loss in individuals with obesity? *BMC Psychiatry* 2013 13:286.

Available online at www.sciencedirect.com
ScienceDirect
Comprehensive Psychiatry 56 (2015) 121–127
COMPREHENSIVE PSYCHIATRY
www.elsevier.com/locate/comppsych

The relationship between childhood history of ADHD symptoms and *DSM-IV* borderline personality disorder features among personality disordered outpatients: The moderating role of gender and the mediating roles of emotion dysregulation and impulsivity

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Abstract

A number of studies have reported data suggestive of a significant association between attention-deficit/hyperactivity disorder (ADHD) and borderline personality disorder (BPD). However, the nature of this relation is not fully understood. This study aimed to evaluate if the relation between retrospectively assessed ADHD symptoms and adult BPD features is moderated by participants' gender and mediated by emotion dysregulation and impulsivity. Two hundred seventeen outpatients meeting *DSM-IV* criteria for at least one personality disorder (PD) consecutively admitted to the Clinical Psychology and Psychotherapy Unit of the Scientific Institute H San Raffaele of Milan, Italy, were administered Italian versions of the following instruments: Structured Clinical Interview for *DSM-IV* Axis II Personality Disorders (SCID-II), Wender Utah Rating Scale (WURS), Difficulties in Emotion Regulation Scale (DERS), and the Barratt Impulsiveness Scale-11 (BIS-11). Moderation analyses revealed a significant association between ADHD and BPD symptoms among only female (vs. male) outpatients. Furthermore, in the female subsample, mediation analyses revealed that both impulsivity and emotion dysregulation fully mediated the relationship between retrospectively assessed ADHD symptoms and current BPD features.

1. Introduction

Borderline personality disorder (BPD) is characterized by a pervasive pattern of instability in emotions, behavior, interpersonal relationships, and self-image [1]. Since the publication of *DSM-III*[2], empirical data have greatly improved our knowledge of BPD. However, there is still a lack of consensus regarding the precise etiology and developmental precursors of BPD [1].

Based on the biosocial developmental model of BPD [3], which proposes that impulsivity and emotion dysregulation (ED) are the key features underlying the development of BPD, Burke and Stepp [12] hypothesized that childhood disorders that share features of impulsivity and ED may represent childhood precursors of adult BPD. One disorder that has received considerable attention in this regard is attention-deficit/hyperactivity disorder (ADHD). Indeed, researchers have proposed that ADHD and BPD share common genetic, behavioral, and neuropsychological impairments [3,4], which may explain the putative developmental links between these two disorders [5]. In addition to impulsivity, which is considered a central feature of both BPD and ADHD [6], shared features of these disorders include poor self-regulation, executive function, and inhibitory control (e.g., Philipsen [7]). Moreover, ADHD and BPD frequently co-occur (e.g., Biederman [8]), with rates of BPD among adults with ADHD ranging from 19% to 37% (e.g., Miller et al. [9]). Finally, there is evidence to suggest that childhood ADHD may be a risk factor for or precursor to

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http://dx.doi.org/10.1016/j.comppsych.2014.09.023
0010-440X/

adult BPD, with retrospective studies consistently finding a significant association between a childhood history of ADHD and adult BPD (e.g., Philipsen et al. [10]) and prospective studies finding that childhood ADHD predicts BPD features in adolescents and young adults [5,11,12].

Despite evidence of a significant association between ADHD and BPD, however, the nature of this relation is not yet fully understood, and moderators of this relation remain unclear. For example, although gender differences in the prevalence and overlap of childhood ADHD and adult BPD have been hypothesized [5], little research has examined the moderating role of gender in this relation. The relative dearth of research in this area is likely due to gender differences in the prevalence of these disorders, with a higher prevalence of ADHD among boys versus girls [13] and a higher prevalence of BPD among female versus male patients in clinical settings [14]. As a result, much of the work on childhood ADHD has focused on boys, whereas the majority of research on BPD has focused on adolescent girls and women (interfering with research on the developmental overlap of ADHD and BPD). Moreover, although Carlotta and colleagues [15] recently found that the combination of action-oriented personality traits and juvenile conduct problems completely mediated the relationship between retrospectively assessed ADHD symptoms and current BPD features in a sample of male and female psychiatric outpatients, no studies to date have examined the role of ED in the relationship between ADHD and BPD in adults (despite the proposed centrality of ED to both disorders; see Beauchaine et al. [16]; Crowell et al. [3]).

Thus, this study aimed to extend extant research in this area by testing the following hypotheses in a mixed-gender sample of consecutively admitted psychotherapy outpatients with at least one personality disorder (PD) diagnosis:

1. Do retrospectively assessed childhood ADHD symptoms and observer-rated adult BPD features show significant associations with measures of ED and impulsivity among personality disordered outpatients?
2. Is there a significant relationship between retrospectively assessed childhood ADHD symptoms and observer-rated adult BPD features among personality disordered outpatients?
3. Is the relationship between childhood ADHD symptoms and adult BPD features moderated by gender?
4. Do ED and impulsivity mediate the association between childhood ADHD symptoms and adult BPD features in female and/or male outpatients?

2. Methods

2.1. Participants

This study included 217 adult outpatients who met *DSM-IV*[17] diagnostic criteria for at least one PD consecutively admitted to the Clinical Psychology and Psychotherapy Unit of San Raffaele Turro Hospital in Milano, Italy from January 2011 to May 2013. The study was approved by a human research review committee, and all subjects provided written informed consent. Inclusion criteria were meeting *DSM-IV* criteria for at least one PD and being at least 18 years of age. Exclusion criteria were: IQ less than 75; diagnosis of schizophrenia, schizoaffective disorder, schizophreniform disorder, or delusional disorder according to *DSM-IV* diagnostic criteria; diagnosis of dementia or organic mental disorder according to *DSM-IV* diagnostic criteria; and education level lower than elementary school. 97 (42.7%) participants were male and 120 (55.3%) were female; mean age of participants was 38.98 years (SD = 10.65).

2.2. Measures

Participants were administrated the Italian versions of the instruments described below; the questionnaires were administered in random order. For all measures, the adequacy of the Italian translations to their respective original versions was controlled by English mother-tongue professional translators through back-translations.

2.2.1. Structured Clinical Interview for DSM-IV Axis II Personality Disorders, version 2.0 (SCID-II [18])

The SCID-II is a semi structured interview that provides both categorical and dimensional (i.e., the number of criteria found) assessments of ten *DSM-IV* PD, as well as depressive PD, passive-aggressive PD, and not otherwise specified (NOS) PD. The SCID-II was administered approximately one week after questionnaire completion by trained raters who were blind to the aims of the study and the participants' personality traits data. Participants with an Axis I disorder were administered the SCID-II interview at acute symptom remission, according to the judgment of the clinicians who were following them in treatment. Although *DSM-IV* conceptualizes mental disorders as distinct categories, several studies have provided data suggesting that PDs may be best represented as dimensional constructs rather than discrete categories (e.g., Edens et al. [19]); thus, in our statistical analyses, we relied only on dimensional scores of PD features (i.e., the number of criteria rated as present for each disorder).

In the present study, the inter-rater reliability of both the categorical PD diagnoses and the dimensional PD scores were acceptable, with a median intra-class correlation (ICC) value of .84 (SD = .15) for the dimensional PD scores and a Cohen κ value for any PD diagnosis of κ = .88. For BPD in particular, the ICC value for the dimensional BPD score was .88 and the Cohen κ value for a BPD diagnosis was .90.

2.2.2. Wender Utah Rating Scale (WURS [20])

The WURS is a self-report questionnaire designed to retrospectively assess the severity of ADHD symptoms during childhood. Ward [20] reported adequate split half reliability of the WURS; the scale also showed a moderate convergence with parent retrospective reports and efficiently

discriminated individuals with adult ADHD from controls. In Ward's study [20], a cut-off score of 46 was proposed. A recent review of extant adult ADHD rating scales rated the WURS, together with the Conners' Adult ADHD Rating Scale (CAARS [21]), as having the best psychometric properties of the fourteen scales identified [22]. The Italian translation of the WURS showed adequate reliability and validity [23]. In the present study, the Cronbach's α value of the WURS total score was .93.

2.2.3. Difficulties in Emotion Regulation Scale (DERS [24])

The DERS is a 36-item measure that provides a comprehensive assessment of overall ED, as well as six specific dimensions: nonacceptance of negative emotions, difficulties engaging in goal-directed behaviors when distressed, difficulties controlling impulsive behaviors when distressed, limited access to effective emotion regulation strategies, lack of emotional awareness, and lack of emotional clarity. The DERS has demonstrated good test-retest reliability and adequate construct and predictive validity [24,25], and is strongly correlated with an experimental measure of emotion regulation among BPD patients ($r = -.63$; see Gratz et al. [26]). In the present study, the DERS total score was used as an index of the overall level of ED; its Cronbach's α value was .91.

2.2.4. Barratt Impulsivity Scale-11 (BIS-11 [27])

The BIS-11 is a 30-item self-report questionnaire that measures three subtypes of impulsivity: motor impulsivity, attention impulsivity, and nonplanning impulsivity. The three scores are summed to produce a total impulsivity score. The Italian version demonstrated psychometric properties (including internal consistency, test-retest reliability, and construct validity) almost identical to those reported for the English version [28]. The present study used the BIS-11 total score; its Cronbach's α value was .80.

2.3. Statistical analyses

Hayes and Matthes' [29] procedure was used to test interactions between gender and WURS scores in predicting DERS and BIS-11 total scores and the dimensional BPD score, as well as interactions of gender with both DERS total score and BIS-11 total score in predicting the dimensional BPD score. The diagnosis of any mood disorder was coded as a dummy variable (0 = absent, 1 = present) and entered as covariate in each moderation analysis. Focal predictors and moderators were mean centered before multiplication [30].

Mediation analyses were carried out according to Shrout and Bolger's [31] and Preacher and Kelley's [32] methods. In order to evaluate the strength of mediation, we computed Preacher and Kelley's [32] κ^2 index; when it was not possible to compute the κ^2 index, we used both the completely standardized indirect effect coefficient (ab_{cs} [32]) and P_M [31] measure. Normal-theory significance tests were used to assess the statistical significance of all path coefficients except indirect effect path coefficients (for which 95% bias corrected confidence intervals (CIs) were computed based on 10,000 bootstrap replications [32]). Mediation and bootstrap analyses were carried out using Hayes' [33] PROCESS macro for SPSS.

3. Results

Descriptive statistics, gender comparisons, variable inter-correlations, and reliability coefficients for the SCID-II BPD dimensional score and the WURS, DERS and BIS-11 total scores are summarized in Table 1.

The most frequently diagnosed *DSM-IV* PD were NOS PD ($n = 60$, 27.6%), narcissistic PD ($n = 60$, 27.6%) and BPD ($n = 29$, 13.4%). 127 (58.5%) patients received at least one *DSM-IV* Axis I diagnosis; the most frequently diagnosed *DSM-IV* Axis I disorders were mood disorders ($n = 69$, 31.8%). No significant effect of any Axis I diagnosis (present vs. absent) was observed; however, participants who received a mood disorder diagnosis scored significantly higher than participants without a mood disorder diagnosis on the BIS-11 total score, $t(215) = 2.51$, $p < .05$, $d = 0.37$, DERS total score, $t(215) = 3.19$, $p < .01$, $d = 0.47$, and SCID-II BPD dimensional score, $t(215) = 2.13$, $p < .05$,

Table 1
Descriptive statistics, gender comparisons, variable inter-correlations (Pearson r coefficients) and reliability coefficients (on the main diagonal) in the whole sample (N = 217).

	Whole sample ($N = 217$)		Male participants ($n = 97$)		Female participants ($n = 120$)		Correlation and reliability coefficients ($N = 217$)				
	M	*SD*	*M*	*SD*	*M*	*SD*	*d*	1	2	3	4
1.WURS	23.95	17.88	27.32	18.09	21.22	17.31	0.34*	.93[a]			
2. DERS	107.07	24.20	102.00	24.26	111.17	23.46	−0.38**	.38***	.91[a]		
3. BIS-11	66.70	10.48	65.50	9.80	67.67	10.96	−0.21	.43***	.42***	.80[a]	
4. BPD	1.73	2.24	1.26	1.88	2.12	2.43	−0.40**	.31***	.44***	.39***	.84[b]

WURS: Wender Utah Rating Scale total score; DERS: Difficulties in Emotion Regulation Scale total score; BIS-11: Barratt Impulsiveness Scale-11 total score; BPD: SCID-II Borderline Personality Disorder dimensional score (i.e., number of BPD criteria); d = Cohen d.

[a] Cronbach alpha coefficient.

[b] Single-rater intraclass correlation coefficient based on random effects one-way ANOVA (i.e., inter-rater reliability estimate).

* $p < .05$.

** $p < .01$.

*** $p < .001$.

d = 0.31. No other between group differences as a function of Axis I diagnoses were significant. In this sample, the number of BPD criteria showed positive, significant correlations with the number of antisocial, $r = .19$, $p < .01$, and histrionic, $r = .25$, $p < .001$, PD criteria, and negative, significant correlations with the number of avoidant, $r = -.17$, $p < .05$, and obsessive-compulsive, $r = -.22$, $p < .01$, PD criteria.

3.1. Moderation analysis results

In all moderation regression analyses, mood disorder diagnosis was entered as a covariate. As expected, both participant gender, $\beta = .19$, $p < .01$, and the WURS total score, $\beta = .17$, $p < .05$, significantly predicted the BPD dimensional score. Further, results revealed a significant interaction between gender and WURS scores in predicting BPD dimensional scores, gender-by-WURS $\beta = .15$, $p < .05$; R^2 change = .02, $p < .05$ (model adjusted $R^2 = .09$, $p < .001$). Whereas no significant association was observed between the WURS total score and the number of BPD traits in male participants, $\beta = .00$, $p > .50$, the WURS total score was significantly associated with the dimensional BPD score among female participants, $\beta = .30$, $p < .01$. Conversely, although both the WURS total score and participant gender were significantly associated with the DERS total score (βs = .34 and .21, respectively; $ps < .01$) and the BIS-11 total score (βs = .37 and .13, respectively; $ps < .05$), the gender-by-WURS interaction was not significant for either the DERS and BIS-11 total scores.

As for the moderating role of gender in the relations between the DERS and BIS-11 scores and the BPD dimensional score, the DERS total score significantly predicted the number of BPD criteria, $\beta = .36$, $p < .001$, with a marginal contribution of participant gender, $\beta = .12$, $p < .10$. Further, results revealed a significant gender-by-DERS interaction, $\beta = .15$, $p < .05$ (model adjusted $R^2 = .19$, $p < .001$), such that the relation between the DERS total score and the dimensional BPD score was stronger among female participants, $\beta = .49$, $p < .001$, than male participants, $\beta = .20$, $p < .05$. Finally, although both the BIS-11 total score, $\beta = .37$, $p < .001$, and participant gender, $\beta = .14$, $p < .05$, emerged as significant predictors of the dimensional BPD score, no significant gender-by-BIS-11 interaction was observed, $\beta = -.02$, $p > .20$; the overall model adjusted R^2 value was .17, $p < .001$.

3.2. Mediation analysis results

Because moderation analyses indicated a significant association between WURS and BPD dimensional scores only among female participants, mediation analyses were conducted for the female participants only. Among the female participants, the WURS score demonstrated a moderate, positive, significant relation to the number of BPD criteria, $\beta = .30$, $p < .001$. Based on Shrout and Bolger's [31] approach to mediation analysis, the WURS was a significant predictor of the DERS total score (standardized path coefficient = .27, $p < .01$), which, in turn, significantly predicted the number of BPD criteria (standardized path coefficient = .44, $p < .001$). The indirect effect of the WURS total score on the dimensional BPD score through the DERS was significant (ab_{cs} = .12, 95% bias corrected CI = .05, .23), although the direct effect of the WURS on the dimensional BPD score remained significant with the DERS in the model (standardized path coefficient = .19, $p < .05$). Thus, findings suggest that the DERS partially mediated the relation between the WURS and BPD dimensional scores. Notably, the indirect effect of the WURS on the dimensional BPD score through the DERS was moderate in size ($\kappa^2 = .11$, 95% bias corrected CI = .04, .19). When a mood disorder diagnosis was entered in the model as a covariate, the mediation analysis results remained almost unchanged (ab_{cs} = .12, 95% bias corrected CI = .05, .23, $P_M = .40$).

In the second mediation model, the WURS significantly predicted the BIS-11 total score (standardized path coefficient = .40, $p < .001$), which, in turn, significantly predicted the dimensional BPD score (standardized path coefficient = .29, $p < .01$). Further, the indirect effect of the WURS on the dimensional BPD score through the BIS-11 total score was significant (ab_{cs} = .12, 95% bias corrected CI = .04, .23), and the direct effect of the WURS on the BPD dimensional score was not significant when the BIS-11 was included in the model. Thus, findings suggest that the BIS-11 fully mediated the relation between the WURS and dimensional BPD scores. The κ^2 value for the indirect effect was .10 (95% bias corrected CI = .04, .18). Notably, when a mood disorder diagnosis was entered in the model as a covariate, we obtained almost identical mediation findings (ab_{cs} = .11, 95% bias corrected CI = .04, .23, $P_M = .37$).

Finally, we simultaneously examined the mediating role of both the DERS and BIS-11 total scores in the relationship between the WURS total score and the dimensional BPD score, controlling for the effect of a mood disorder diagnosis. The results of this mediation analysis are summarized in Fig. 1. The indirect effects of the WURS on the dimensional BPD score through both the DERS (ab_{cs} = .11, bias corrected 95% CI = .03, .22) and BIS-11 (ab_{cs} = .08, bias corrected 95% CI = .02, .18) total scores were significant, and the difference between the two indirect effects was non significant ($\Delta = .03$, bias corrected 95% CI = −.08, .15). Thus, results suggest that the DERS total score and the BIS-11 total score accounted for a comparable amount of the relation between the WURS total score and the dimensional BPD score. Furthermore, the direct effect of the WURS on the BPD dimensional score became non-significant when the DERS and BIS-11 total scores were included in the model (standardized path coefficient = .10, $p > .30$; $P_M = .65$).

4. Discussion

Consistent with previous findings (e.g., Philipsen [7]), results of this study revealed a significant association

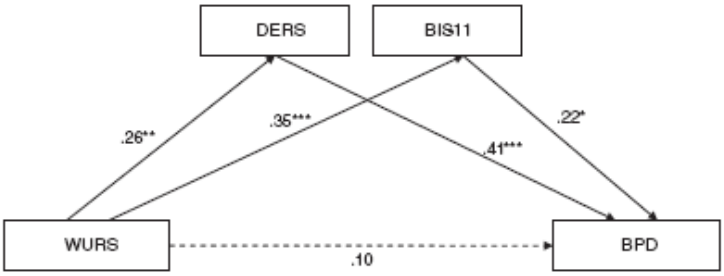

Fig. 1. Path diagram showing completely standardized mediated effect (through Difficulties in Emotion Regulation Scales and Barratt Impulsiveness Scale-11) and direct effect of the Wender Utah Rating Scale on SCID-II BPD Dimensional Scores. The model included the presence of any mood diagnosis as control variable. For ease of presentation residual terms were omitted. Note. WURS: Wender Utah Rating Scale total score; DERS: Difficulties in Emotion Regulation Scale total score; BIS-11: Barratt Impulsiveness Scale-11 total score; BPD: SCID-II Borderline Personality Disorder dimensional score. * $p < .05$. ** $p < .01$. *** $p < .001$.

between a childhood history of ADHD symptoms (retrospectively assessed using the WURS) and *DSM-IV* BPD criteria in adult outpatients with a PD. Importantly, however, this relation was found to be moderated by gender and significant among only the female participants. These findings suggest that gender may be an important factor to consider in understanding the relation between childhood ADHD and adult BPD, at least in clinical populations. Consistent with Philipsen [7], our findings suggest that childhood ADHD symptoms may not invariably progress toward adult BPD, evidencing a significant relation to adult BPD features only among women. Thus, the developmental progression of childhood ADHD to adult BPD may depend on the presence of additional vulnerability and risk factors that have different rates of occurrence (or different implications) across gender [7]. For instance, several studies have reported that attachment disturbances (e.g., Fossati [34]) and, to a lesser extent, sexual abuse (e.g., Fossati et al. [35]) in childhood may represent serious risk factors for adult BPD. However, both sexual abuse and attachment disturbances have been found to vary as a function of gender [36,37]. Further research should investigate how developmental risk factors, such as childhood abuse/neglect and attachment disturbances, may differently interact with childhood ADHD symptoms in influencing the developmental trajectory of BPD in females versus males.

Confirming and extending previous findings [26], both ED and impulsivity were significantly associated with *DSM-IV* BPD criteria in both male and female outpatients with a PD diagnosis. Indeed, consistent with the biosocial developmental model of BPD, findings from this study suggest that ED and impulsivity represent dissociable constructs that are both central to BPD psychopathology [3,26]. Specifically, both ED and impulsivity emerged as unique predictors of BPD criteria and unique mediators of the relation between childhood ADHD and adult BPD symptoms in women. Indeed, consistent with past research [15], mediation analyses revealed that ED and impulsivity fully mediated the relation between childhood ADHD symptoms and *DSM-IV* BPD criteria in female PD outpatients. These findings suggest that the persistence into adulthood of marked difficulties in both emotion regulation and behavioral control/planning may represent a critical element in the relation between a childhood history of ADHD and BPD features in women. In addition, our results are consistent with those from a recent meta-analytic paper [38] suggesting that emotion dysregulation is prevalent in ADHD throughout the lifespan and is a major contributor to impairment. Moreover, these findings are particularly interesting in light of research on the clinical course of ADHD from childhood to adulthood, which indicate that although the inattentive symptoms of ADHD persist over time, the impulsivity and hyperactivity symptom clusters of ADHD tend to remit over time [39]. Thus, findings of an indirect relation between childhood ADHD and adult BPD symptoms through impulsivity are unlikely to be a by-product of the simple persistence of ADHD symptoms into adulthood. Further research is needed to investigate the factors that may interfere with the typical course of ADHD and lead to the persistence of emotion dysregulation and impulsivity over time (thus increasing the risk for adult BPD features).

Of course, the results of this study should be considered in the context of several limitations. The main limitation of the present study concerns the retrospective nature of the assessment of childhood ADHD symptoms; as a result, the risks of memory and other retrospective biases cannot be completely ruled out [40]. In addition, we did not perform a formal assessment of *DSM-IV* adult ADHD; this prevented us from definitively rule out the effects of a current ADHD diagnosis on the relation between a history of childhood ADHD and adult BPP features. A second major limitation of this study is its cross-sectional design; results of the mediation analyses need to be interpreted with caution, as alternative models of the direction and temporal ordering of the relations of interest cannot be ruled out. In addition, the moderate sample size prevented us from using multivariate logistic models with a BPD diagnosis as the dependent variable in moderation and mediation analyses. Furthermore,

although our sample consisted of consecutively admitted patients, participants were not randomly selected from the relevant population as whole; thus, this sample may be more accurately conceptualized as a convenience sample of outpatients than a representative sample. This sampling procedure raises questions about the generalizability of our findings to different clinical samples, as well as community and nontreatment-seeking samples. Further research is needed to replicate these findings in both clinical and nonclinical samples. Additionally, no measures of general psychiatric symptom severity were included in this study and, thus, we were not able to control for the potential influence of psychiatric symptoms in general on the relations of interest. Finally, the exclusive reliance on self-report measures of impulsivity, ED, and childhood ADHD symptoms has well-documented limitations and may have biased the associations among the measures of these constructs. Future research examining this model would benefit from the use of behavioral and laboratory measures of ED and impulsivity (see, e.g., Dougherty et al. [41]; Gratz et al. [26,42]).

Despite these limitations, the results of the present study contribute to the extant literature on the relation between childhood ADHD and adult BPD features, as well as the roles of both impulsivity and ED in BPD.

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IV CONVEGNO REGIONALE "ATTENZIONE BAMBINI A SCUOLA!"

Sabato 31 Gennaio 2015

Prato, Palazzo Vescovile – Piazza Duomo

Destinatari: psicologi, neuropsichiatri infantili, pediatri, pedagogisti, logopedisti, terapisti della neuropsicomotricità, assistenti sociali, educatori, insegnanti, genitori.

Programma:
8.30-9.00 - Registrazione dei partecipanti
9.00-9.30 - Saluti delle Autorità
Mariagrazia Ciambellotti - Assessore all'Istruzione Pubblica e Pari Opportunità Comune di Prato
Sara Pezzica – Presidente Aidai Toscana
Moderatore: Letizia Rosati – Psicologa Aidai Toscana, referente per la provincia di Prato
9.30-10.30 - Lezione magistrale - La prevenzione dei disturbi del comportamento in ambito scolastico
Ersilia Menesini - Professore ordinario Dipartimento Scienze Formazione e Psicologia, Università di Firenze
10.30-11.15 – Un modello di trattamento in rete dei disturbi dirompenti del comportamento: il servizio "Al di là delle nuvole"
Annarita Milone - Neuropsichiatra infantile, IRCCS Fondazione "Stella Maris"- Pisa
11.15-11.30 - coffee break
11.30-12.15 - I processi cognitivi nel DDAI: valutazione e intervento
Stefano Taddei – Psicologo Psicoterapeuta, Dip. Scienze della Salute Università di Firenze
12.15-13.00 - Alleanza scuola-famiglia: costruire una rete
Sara Pezzica - Psicologa Psicoterapeuta, Dip. Psicologia dello Sviluppo e dell'Educazione Univ. Di Firenze, Presidente AIDAI Toscana
Simona Caracciolo – Psicologa Psicoterapeuta, AIDAI Toscana Moderatore: Luciano Luccherino – Direttore UOC Neuropsichiatria Infantile ASL 8 Arezzo
14.30-15.00 - La psicomotricità funzionale nei bambini con DDAI
Letizia Bulli – Pedagogista, Psicomotricista Funzionale
15.00-15.30 - Training neuropsicologici
Giovanni Squitieri, Psicologo-Psicoterapeuta, specialista in Neuropsicologia dell'età evolutiva, Presidente Agoretis, Aidai Toscana
15.30-16.30 - Seguire i bambini nei compiti a casa: l'Home Tutoring
Gianluca Daffi – Dip. Psicologia Università Cattolica del Sacro Cuore, Spedali Civili di Brescia
16.30-17.00 - Il training matacognitivo in classe
Gianluca Perticone – Insegnante, Pedagogista, Dip. Scienze della Formazione, Aidai Toscana
17.00-17.30 - discussione e conclusioni
17.30-18.30 - assemblea dei soci AIDAI Toscana

Quota di iscrizione: entro il 15 gennaio 2015: € 35,00 per tutte le categorie.
Dopo il 15 gennaio: € 50,00 per tutte le categorie.

Partecipazione gratuita per i soci Aidai.

Per partecipare al convegno è necessario compilare la **SCHEDA DI ISCRIZIONE** e inviarla, unitamente alla copia del pagamento, all'indirizzo mail aidai.infoprato@gmail.com.

Per Info e aggiornamenti relativi al programma:
www.aidaiassociazione.com
aidai.infoprato@gmail.com
Tel. 366 1959748

Per ricevere la newsletter iscriversi al seguente indirizzo:
http://crc.marionegri.it/bonati/adhdnews/subscribe.html

Iniziativa nell'ambito del Progetto di Neuropsichiatria dell'Infanzia e dell'Adolescenza
(Delibera n. 406 - 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)
Capofila Progetto: UONPIA Azienda Ospedaliera "Spedali Civili di Brescia"
"*Percorsi diagnostico-terapeutici per l'ADHD*".

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