KING'S College LONDON
University of London

# ADHD in Children and Adolescents with Intellectual Disabilities

## Who is responsible and can we screen effectively?

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## Criteria for each condition

**ADHD**

- Inattention and hyperactivity/impulsivity

  AND

- Behaviour is more than expected based on age and intellectual functioning

**Intellectual disability**

- Severity of intellectual impairment

  AND

- Impairment in adaptive functioning in
  - communication
  - social skills
  - personal independence
  - school or work functioning

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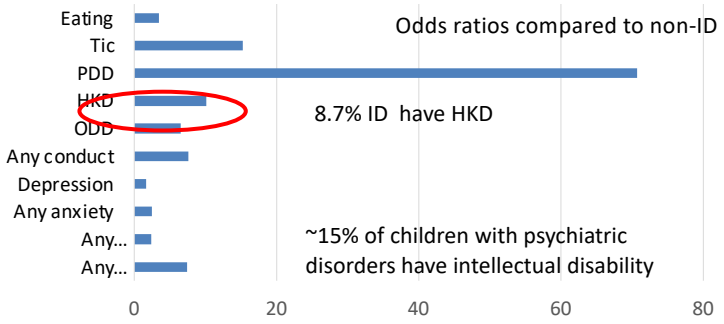
# Increased risk of disorder in intellectual disability




Emerson, E. (2003). Journal of Intellectual Disability Research 47: 51-58.

| Study | Criteria | Rate |
|---|---|---|
| Dekker & Koot (2003) | DSM-IV | 14.8 |
| Buckley 2020+ )5_ | DSM-5 | 30 |
| Platt et al (2019) | DSM=5 | 3.5 |

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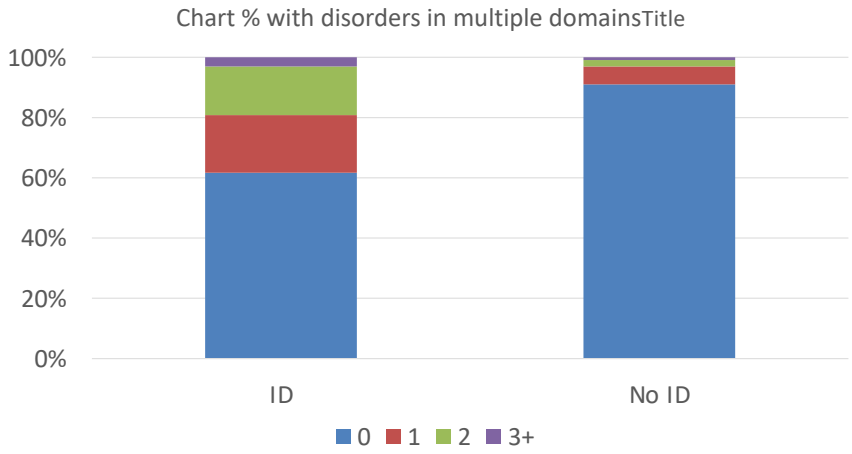
# Increased risk of multiple psychiatric disorders in intellectual disability




Emerson, E. (2003). Journal of Intellectual Disability Research 47: 51-58.

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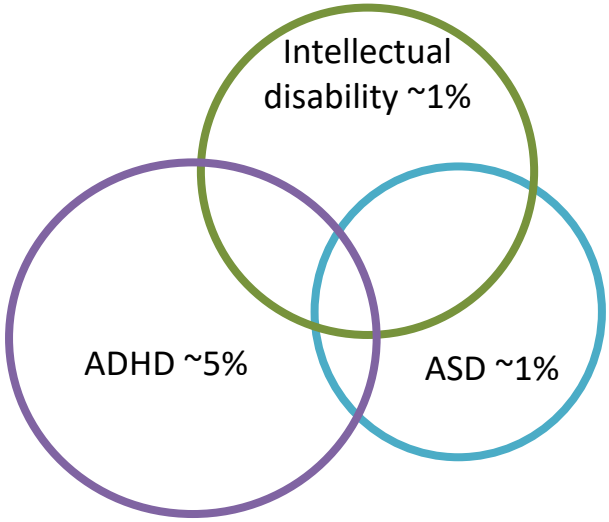
# Overlap with other neurodevelopmental conditions

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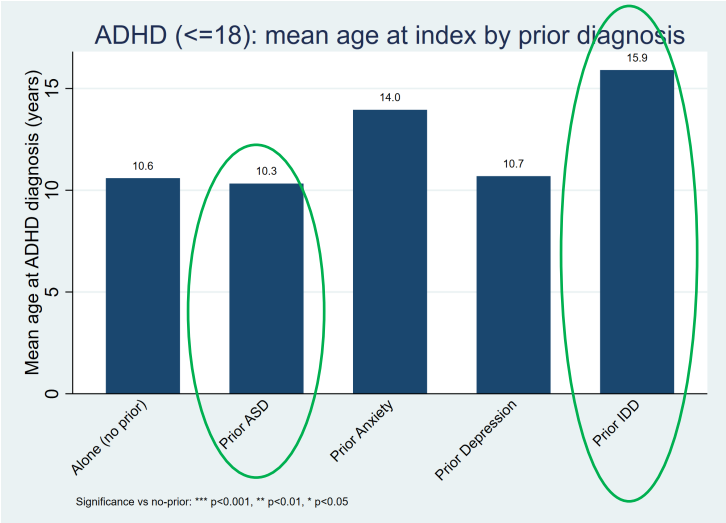
# Impact of prior Diagnoses on ADHHD Recognition




From CPRD forthe Independent Prevalence Review

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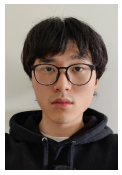
# Recognising ADHD in ID project

**AIM:1:** to identify and validate screening tools for ADHD to use with children and young people with intellectual disability

**AIM 2**: to understand how parents and professionals recognise and refer ADHD in CYP with ID

Dr Melanie Palmer



Mr Zhaonan Fang

Ms Rhiannon Bailey

Ms Joyce Vericio

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# Aim of our analysis of the accuracy of screening tools

- Psychometric characteristics of ADHD measures used in various studies from our group
- Are any fit for purpose as screening tools?

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# Psychometrics: Conners-3 and ABC Hyperactivity Scale

From Hyperactivity and Special Educational Needs (HSEN) randomised controlled trial. Simonoff et al., 2013

| Characteristic | N=122 |
|---|---|
| **Child** | |
| Mean age, range | 11years, 7–15 years |
| Sex | 70% male |
| School type | 27% mainstream, 69% specialist, 4% other |
| Mean IQ, range | 53, 31–71 |
| IQ groups | 68% mild, 32% moderate, severe/profound |
| **Parent** | |
| Informant | 86% mothers |
| Parental education | 56% GSCEs or lower |
| **Teacher** | |
| Informant | 78% teachers, 9% learning support assistant |
| Time known child | 93% more than one term |

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# Measures explored

**Conners' (hyperactivity scale, ADHD index)**

- Parent-reported
- Teacher-reported

**ABC (hyperactivity subscale)**

- Parent-reported
- Teacher-reported

**ANALYSIS OF:** Reliability, item performance using item response theory, and measurement invariance using multiple indicators, multiple causes (MIMIC) models.

Palmer, et al. (2024). *J Intellect Disabil Res, 68(12), 1408-1421.*

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# Descriptives and Reliability

| Measure | *M* (*SD*) | | | Cronbach's alpha | | |
|---|---|---|---|---|---|---|
| | IQ<50 | IQ>=50 | Total | IQ<50 | IQ>=50 | Total |
| P Conners' hyperactivity | 12 (4) | 12 (4) | 12 (4) | .80 | .76 | .77 |
| P Conners' ADHD Index | 28 (7) | 28 (6) | 28 (6) | .87 | .83 | .84 |
| P ABC hyperactivity | 33 (9) | 31 (9) | 32 (9) | .89 | .90 | .90 |
| T Conners' hyperactivity | 11 (6) | 10 (6) | 10 (6) | .92 | .90 | .91 |
| T Conners' ADHD Index | 22 (10) | 20 (9) | 21 (10) | .94 | .93 | .94 |
| T ABC hyperactivity | 24 (14) | 20 (13) | 21 (13) | .96 | .96 | .96 |
| P=Parent, T=Teacher | | | | | | |

**Less reliable items**

**P:** *attends if interested, constantly runs or jumps*

**T:** *runs or climbs excessively interrupts or intrudes*

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# Measurement invariance – factors that ↑ or ↓ item endorsement

**Parents**

**Higher IQ:**

- Conners' *Difficulty waiting* ↑

**Higher autism**

- Conners' *Difficulty waiting* ↓
- Conners' *Attends if interested* ↑
- ABC *No attention when spoken to* ↑

**Increased child age:**

- Conners' *Always "on the go"* ↓
- Conners' *Short attention span* ↓
- ABC *Disturbs others* ↑
- ABC *Constantly runs or jumps* ↓
- ABC *Excessively active* ↓

**Teachers**

**Higher IQ:**

- No effects

**Higher autism:**

- Conners' *Disturbs others* ↑

**Increased child age:**

- No effects

**All observed effects on item endorsement were small in size.**

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## ADHD screening in autistic young adults

- How do SDQ hyperactivity scale, ABC hyperactivity and Conners ADHD Rating Scale function against ADHD diagnosis in autistic young adults
- Diagnosis on parent-reported Young Adult Psychiatric Assessment
- From Special Needs and Autism Project (SNAP) cohort

Palmer et al. (2024). *J Autism Dev Disord, 54(12), 4674-4683*

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## Sample characteristics

| | N=122 |
|---|---|
| Mean age | 23 y |
| % male | 90% |
| % white ethnicity | 94 |
| Mean IQ | 84 |
| IQ<70 | 29% |
| YAPA ADHD diagnosis | 23% |

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# Receiver operating characteristics (ROC)

| | IQ<70 | IQ 70+ |
|---|---|---|
| Parent SDQ hyperactivity | .74 | .75 |
| Young adult SDQ hyperactivity | N/A | .65 |
| ABC hyperactivity | .77 | .66 |
| CAARS | .71 | .76 |

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# Sensitivity and specificity on optimal cut-points

| | Sensitivity | Specificity | Correct classification | Optimal/standard cut-point |
|---|---|---|---|---|
| Parent SDQ | | | | |
| IQ<70 | .60 | .93 | .86 | 8/7 |
| IQ 70+ | .67 | .94 | .89 | 8/7 |
| ABC hyperactivity | | | | |
| IQ<70 | .96 | .55 | .73 | |
| IQ 70+ | ..86 | .39 | .47 | |
| CAARS | | | | |
| IQ<70 | .55 | .92 | .78 | 60/60 |
| IQ 70+ | .93 | .60 | .66 | 53/60 |

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## DBC as ADHD screener in young autistic children

- Based on sample
- Young children receiving clinical autism diagnosis by age 4 years in two London boroughs
- Screened with Developmental Behavior Checklist (DBC) – parent and teacher -and Profile of Neuropsychiatric Assessment (PONS)
- Diagnostic assessment with Preschool & Primary School Assessment (PAPA) for psychiatric diagnoses

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## DBC as ADHD screener in young autistic children

| | N=122 |
|---|---|
| Mean age | 6.8y |
| % male | 57% |
| % white ethnicity | 51% |
| Mean IQ | 66 |
| IQ<70 | 57% |
| PAPA ADHD diagnosis | 59% |
| % mainstream school | 70% |

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# DBC as ADHD screener in young autistic children

| | Cutpoint | AUC | Sens. | Spec | PPV | NPV | Correctly class. |
|---|---|---|---|---|---|---|---|
| Parent | | | | | | | |
| IQ<70 | 10 | .71 | .63 | .89 | .90 | .61 | 73% |
| IQ 70+ | 9 | .74 | .83 | .59 | .83 | .59 | 63% |
| Teacher | | | | | | | |
| IQ<70 | 7 | .50 | .50 | .58 | .67 | .42 | 52% |
| IQ 70+ | 8 | .54 | .28 | .89 | .74 | .59 | 56% |

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# Summary

- No screener has adequate psychometric properties to be used to determine criteria for referral
- This also applies to non-ID screening

**Systematic Review and Meta-analysis: Screening Tools for Attention-Deficit/Hyperactivity Disorder in Children and Adolescents**

Melissa Mulraney, PhD, Gonzalo Arrondo, PhD, Hande Musullulu, MPsych, Iciar Iturmendi-Sabater, MPsych, Samuele Cortese, MD, Samuel J. Westwood, PhD, Federica Donno, PhD, Tobias Banaschewski, MD, Emily Simonoff, MD, Alessandro Zuddas, MD, Manfred Döpfner, PhD, Stephen P. Hinshaw, PhD, David Coghill, MD

Drs. Mulraney and Arrondo shared first authorship of this article.

doi:10.1016/j.jaac.2021.11.031

- Optimal cut-points for general populations may not be accurate
- Using questionnaires may be appropriate for gaining information but clinical judgment essential

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# Aims

- Understand how parents, teachers, different clinicians think about whether ADHD may be problem over and above ID
- What tools are used and preferred in considering ADHD
- What strategies would increase diagnostic confidence

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# Parental views

- Finding information on ADHD was difficult, especially if child had other neurodevelopmental conditions
  - Often compared child's behaviour with other children or online resources
  - Recognising quality of online information varied – difficult to know what to trust
- Process for obtaining referral and diagnosis unclear
- Tended to rely on information from teachers or GPs for referral
- Further post-diagnostic support was requested (e.g. psychoeducation, parent groups, child groups)

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## Special schools: teacher views

- Recognised ADHD a separate condition, could co-occur with intellectual disability.
- Often viewed other needs as more important, e.g., autism
- Specialist education felt holistic approach managed ADHD in school context
- Less likely to raise as concern with parents if parents didn't raise
- Further support from health and educational psychology in identification/referral welcomed

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## Paediatrician and Psychiatrits views

- Diagnosis should be made on the basis of chronological and developmental age. Verbal ability should be considered alongside level of intellectual ability.
- Importance of screener with broad coverage of development as well as ADHD-specific
- Better to 'over-screen' than not at all
- Clinicians needing to make own adaptations

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## Paediatrician and Psychiatriss views

- Barrier: lack of knowledge of co-occurring NDD amongst referrers
- Barrier: early identification and referral from GPs
- Barrier: changing neurodevelopmental pathways and disorder-specific pathways

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## General Practitioner views

- Do not have skills to recognise ADHD in presence of ID
- Felt population that they saw as being held by community paediatricians (although not always the case in practice) and their responsibility to recognise/refer/diagnose (not GP)
- Saw their role as signposting to paediatrics/CAMHS
- Barriers of complicated, varying and changing care pathways
- Means parents need to drive forward referral process with implications for those less able to do this

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# Summary

- Psychiatrists/paediatricians confident in ability to identify and diagnosis ADHD

HOWVEVER

- Gaps in process for identifying/referring CYP specialist services
  - Current screening measures not psychometrically valid
  - Key professionals in pathway do not have skills/prioritise referral
  - Parents do not have enough information to advocate

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