Objective measures of core ADHD symptoms in children and young people in naturalistic settings: A scoping review protocol

Authors

Charlotte Rose Kelman[1] Jo Thompson Coon [1] Obioha C Ukoumunne [1] Darren Moore [1] Rebecca Gudka [1] Eleanor F Bryant[1] Abigail Russell[1]

1. University of Exeter

Abstract

Objective: This scoping review aims to understand the range and type of objective measures for Attention-Deficit/ Hyperactivity Disorder (ADHD) in children and young people that could be applied in naturalistic settings.

Introduction: Clinicians predominantly rely on interviews and rating scales from multiple sources for ADHD assessment. This is considered the diagnostic "reference standard", but these are prone to issues such as informant bias and inconsistencies between different sources. Objective measures have been suggested to mitigate these issues. An objective measure is a method that assesses symptoms related to ADHD through non-opinion-based means (e.g., systematic behavioural observation and accelerometers). The data are thought to be less biased and opinion-based than subjective forms of assessment (e.g., interviews, teacher/parent rating scales). A plethora of objective measures have been put forward, with some researchers suggesting that assessments in naturalistic settings are most helpful in diagnosing children and young people. Previous studies have reviewed areas related to this question, but these need updating, focusing on objective measures in naturalistic settings.

Methods: Arksey and O'Malley's scoping review methodology framework will provide the structure of this scoping review. Electronic databases (MEDLINE, EMBASE, British Education Index (BEI), Education Resources Information Centre (ERIC), Education Research Complete, Education Abstracts, Child Development and Adolescent Studies, Psychology and Behavioural Sciences Collection, Cumulative Index to Nursing and Allied Health Literature (CINAHL), APA PsycINFO) and grey literature sources will be searched between 1st December 2021 and 28th February 2022 to identify papers relevant for inclusion. This will be followed by forward and backward citation searches of relevant reference lists.

Two reviewers will independently screen the titles, abstracts, and full text of papers. Any paper focusing on objective measures of ADHD that could be applied in naturalistic settings will be included. Sociodemographic characteristics of the participants, study characteristics and psychometric properties of the measures will be summarised and reported. Any unexpected data not captured by the data charting sheet may be included if valuable to the research questions.

Inclusion criteria: Participants are children and young people aged 18 years old or under, who have been measured for ADHD traits with an objective measure.

Introduction

Attention-Deficit/ Hyperactivity Disorder (ADHD) is a neurodevelopmental disorder affecting 4-8% of children (Danielson et al., 2018; Mohammad-Reza et al., 2021; Polanczyk et al., 2014; Sans et al., 2021), with up to an estimated 66% of cases persisting into adulthood (Simon, 2022). Common characteristics of ADHD include inattention, hyperactivity, and impulsivity. Although these traits can be found across all children and young people (CYP), they are more prominent in those with ADHD and can negatively impact functioning at home, school, or in social situations. Multiple studies have found ADHD to be a risk factor for adverse functional outcomes, such as educational underachievement, chronic health problems and criminality. These issues can create significant issues for families and societal burden on educational, criminal, health, and social care systems. Due to the issues associated with ADHD, early intervention can prevent problems from occurring. An assessment and diagnosis can help facilitate access to support and treatment that may mitigate the adverse effects of the condition.

However, the current ADHD assessment process is highly disputed. Over-diagnosis of ADHD is widely reported in the media, with one claim being that ADHD has become overly medicalised. This perspective implies that the symptoms of ADHD are simply part of normal human behaviour, and by classifying them as symptoms, it identifies non-harmful issues (Conrad & Bergey, 2014; Hinshaw, 2018; Lusardi, 2019). This is particularly pertinent with a predominantly childhood-onset disorder like ADHD, where the increase in CYPs acquiring these labels is associated with concerns about the "medicalisation of childhood" (Singh & Wessely, 2015).

On the other hand, some literature points towards under-diagnosis, especially in particular populations. For example, the difference between ADHD diagnosis in boys and girls falls in the range between 2:1 to 10:1 (Arnett et al., 2015; Biederman et al., 2002; Ramtekkar et al., 2010; Willcutt, 2012a). The higher ratios were found in clinical samples rather than community samples, which suggests girls may be underdiagnosed in clinical practice (Mowlem et al., 2019; Ramtekkar et al., 2010). It has been suggested that a young person's probability of receiving an assessment or diagnosis is dependent on individual characteristics (e.g., gender, socioeconomic status, where the young person lives) (Madsen et al., 2018; Sayal et al., 2018; Willcutt, 2012b). Furthermore, those assessed may be misdiagnosed with another

psychiatric condition (Mullet & Rinn, 2015; Thongseiratch & Worachotekamjorn, 2016). This highlights the possibility that some young people may have been missed.

Adding to these issues, ADHD is difficult to diagnose. Evidence suggests ADHD has biological causes, which can be alleviated or exacerbated by the environment. It can also be present in numerous ways. The heterogeneous nature of ADHD implies a singular test may not be able to capture all the possible impairments affecting a person. Although the National Institute for Health and Care Excellence (NICE) has provided guidelines for the diagnosis and management of ADHD in England and Wales (*Attention Deficit Hyperactivity Disorder: Diagnosis and Management NICE Guideline,* 2018), in practice there is unsurprisingly little consistency in assessment, diagnosis or management (Hall et al., 2022; Newlove-Delgado et al., 2019; NICE, 2013).

The range of presenting behaviours and lack of biological tests also means that subjective assessments have long been used to assess ADHD. A subjective measure of ADHD refers to methods used to evaluate symptoms related to ADHD that rely upon an assessor's interpretation which their opinions, assumptions or beliefs can influence. The 'reference standard' for ADHD diagnosis is a combination of measures, as one test may not encapsulate all the issues a person experiences.

Assessment process

The reference standard typically includes a clinical history and examination, rating scales and observations, as well as neuropsychological testing, aiming to gather information on their personal, family, and educational experiences (Gualtieri & Johnson, 2005). A clinician judges whether the child meets diagnostic criteria based on the evidence received from the parents, teachers, and the child themselves. This evidence can be in the form of clinician, parent, teacher, and self-reporting rating scales, utilising opinions of the young person's symptoms to put a numerical value on the severity. The clinical interview and rating scales will be combined, often with observations of the child. Most of this process relies on different perceptions of the young person's symptoms. Although this is considered the 'reference standard' method, it is prone to flaws.

Subjective measures rely on interpretations and are often vulnerable to informant bias, self-perception bias and "halo effects" (Alacha & Lefler, 2021; Hartung et al., 2010). If operating in line with NICE guidelines, a clinician will generally gather information from a combination of sources, including (a) interviews with parents, teachers and sometimes the child, (b) clinical and school observations, and (c) behaviour and neuropsychological functioning tests (NICE, 2018). The subjective nature of assessments can lead to significant inconsistencies in ratings across different sources, which could be overcome using measures that do not rely on opinion or interpretation.

An objective measure of ADHD is a method that assesses symptoms related to ADHD, which alleviates some issues of bias as it is not influenced by an individual's

opinion. Examples include continuous performance tests (CPT), systematic behavioural observations and psychophysiological tests, as well as more recent methods such as virtual reality and functional magnetic resonance imaging (fMRI). One study conducted by Esmer and colleagues found they were able to predict a child's ADHD diagnosis with 79% accuracy[1] solely using objective measures and with 86.7% accuracy when combined with subjective measures [Conners ADHD rating scales self- and observer rating long version (CAARS-L: S/O) and Conners-3 parent/teacher ratings], against the standard diagnostic procedure for ADHD at the participants' outpatient clinic (including clinical interviews, self and observer ratings and neuropsychological tests) (Emser et al., 2018).

This finding is significant when addressing the controversies surrounding ADHD. Emser et al. (2018) suggested that objective measures are an asset and should be an integral part of the assessment. However, without a formalised recommendation, it is difficult for practitioners to incorporate the most effective type of objective measure into their diagnosis and monitoring of the condition.

Our proposed scoping review will build on a systematic review conducted in 2018 (Minder et al., 2018) in several ways. Firstly, we will include all objective measures used in naturalistic settings rather than solely systematic behavioural observations. Secondly, we will also have data on acceptability, implementation, reliability and validity measures. And finally, our search dates will be from 1987 to 2022, extending the previous date range of 1990 to 2016.

A naturalistic setting is an environment where the participant would be in day-to-day life; for example, for CYP, a naturalistic setting could be at home or school. Minder et al. (2018) argued that naturalistic settings are particularly exposed to "uncontrollable contextual factors", making them less reliable. However, in diagnosing individual CYP, practitioners need to be aware of the individual's experiences during everyday activities. Diagnosis would be more accurate if it included measures from naturalistic settings because CYP experience their symptoms of ADHD within those settings, and artificial environments (e.g., clinics) may evoke artificial responses. When isolated from their natural environment, the child may (consciously or unconsciously) change their behaviour when knowing they are being observed. Furthermore, the "uncontrollable contextual factors" will not be present. These distractions are a part of a person's everyday life and should not be discounted when considering child behaviour, as all behaviour is a product of interaction between a person and their environment. Furthermore, the clinical definition of ADHD specifies that symptoms should be present across settings; hence assessing symptoms in a lab will not help indicate symptom occurrence in the child's standard variety of settings.

This scoping review aims to understand the range and type of objective measures of Attention-Deficit/ Hyperactivity Disorder (ADHD) in CYP that could be applied in naturalistic settings.

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[1] An average percentage of sensitivity and specificity was formulated

Review question

The research questions are:

1. What are existing objective measures of ADHD in children and young people that could be applied in naturalistic settings?
2. What types of objective measures are there?
3. What populations have been included?
4. What is the reliability, validity and implementation of the objective measures?

Keywords

Objective measures, ADHD, Children, Young people, Naturalistic settings

Eligibility criteria

Participants

Eligible studies will include children and young people aged 18 years old or under presenting with any of the three main ADHD symptoms: hyperactivity, impulsivity and inattention. Either a clinical diagnosis or a research diagnosis, such as the Development and Wellbeing Assessment (DAWBA), may be reported, but the participant does not require any diagnosis, they need to present with symptoms of ADHD as indicated by a validated measure of symptoms.

Studies focused on adults, or non-human participants will not be included.

Concept

For this scoping review, a naturalistic setting is a child's everyday variety of settings. This could include home, school or community settings; however summer programs will not be included. If a study takes a child out of their everyday routine, it will not be eligible for inclusion. Any objective measure that could be applied in naturalistic settings to assess symptoms of ADHD will be considered, including behavioural observations, accelerometers, and rating scales that measure the frequency of ADHD behaviour. Rating scales that ask about perceptions of symptoms will be excluded. Subjective measures alone will not be considered, including rating scales that focus on the assessors' thoughts on the participants' behaviour. Studies with subjective measures will be considered when assessed with or against objective measures.

Context

Any eligible paper from any country will be included. Still, foundation studies such as those reporting the initial development of an objective measure will be located and included if published before 1987. Only papers written in English will be included to prevent any miscommunication when translating.

Types of Sources

Any study designs. Depending on the research question, systematic reviews that meet the inclusion criteria will be considered. Studies from relevant reviews that

don't fully meet inclusion criteria will be screened as additional finds (e.g., if a review includes adults and children, they will not be included).

Methods

We will use Arksey and O'Malley's scoping review framework and the Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews Checklist (PRISMA-ScR). The Joanna Briggs Institute (JBI) reporting guidance (Peters et al., 2020) has been used to inform the protocol report.

Search strategy

The search strategy will aim to identify published peer-reviewed journal articles and grey literature. An initial preliminary search of MEDLINE, APA PsycINFO and Embase via OVID was conducted to locate articles relevant to this area and to scope the size of the searches.

Electronic databases [MEDLINE, EMBASE, British Education Index (BEI), Education Resources Information Centre (ERIC), Education Abstracts, Education Research Complete, Child Development and Adolescent Studies, Cumulative Index to Nursing and Allied Health Literature (CINAHL), APA PsycINFO, Psychology and Behavioural Sciences Collection], reference lists and grey literature sources will be searched between 1st December 2021 and 28th February 2022. Forwards and backwards citation searching and grey literature searching will occur between 30th June 2022-31st August 2022.

Study/Source of Evidence selection

Following the search, all identified citations will be collated and uploaded into Endnote with any duplicates removed. We will use CADIMA software for screening. Two independent reviewers will undertake a pilot screen of titles and abstracts of 25 papers against the inclusion criteria to ensure consistency in understanding and interpretation between screeners. If necessary, the screening guide will be amended for clarity. After the pilot screen, the rest of the titles and abstracts will be screened.

The full texts of papers with potentially relevant titles/abstracts will be retrieved and assessed in detail against the inclusion criteria by two independent reviewers. Reasons for exclusion of papers at full text will be recorded and reported. Any disagreements that arise between the reviewers at each stage of the selection process will be resolved through discussion between reviewers. If it cannot be resolved between the two reviewers, a third opinion will be obtained. The results of the search and the study inclusion process will be reported in full and presented in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-analyses extension for scoping review (PRISMA-ScR) guidelines.

Data Extraction

Data will be extracted from papers by lead author with 10% extraction checked with a second member of the team. This will be completed using a data charting tool developed by the primary reviewer; all data extraction will be checked. The data extracted will include specific details about the participants, context, study methods and key findings relevant to the review question.

The draft data charting tool will be piloted. After piloting studies, the reviewers will discuss any amendments. Modifications will be detailed in the scoping review. Any disagreements that arise between the reviewers will be resolved through discussion. If appropriate, authors of papers will be contacted to request missing or additional data, where required.

Data Analysis

Due to the descriptive nature of the research questions to be answered by this scoping review, a narrative synthesis will be the most appropriate way to analyse the data. Narrative synthesis involves making a coherent narrative from multiple study findings often using tables and graphs to display results. For this study, it is anticipated that there will be a wide range of papers, so the studies will be grouped and synthesised based on commonalities (e.g., type of objective measure, age group tested, core symptom tested).

Table 1- Table of Anticipated Comparison Characteristics -

Type of objective measure	Type of diagnosis
Core symptom tested	Comparison measure
Country of origin	Duration of measure
Age group	Inter-rater reliability
Gender	Construct validity
Ethnicity	Sensitivity
Specificity	

The data will be cross-tabulated, using the research questions to inform the characteristics being compared (see table 1). It is anticipated that possible key groups being cross-tabulated will include characteristics identified in table 1. Following on from this, emerging relationships within and between studies will be reported and explored through idea webbing and concept mapping (Clinkenbeard, 1991; Mulrow et al., 1997). To test the robustness of the synthesis, the reviewers will reflect critically on the synthesis process(Busse et al., 2002).

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Conflicts of interest
All authors declare no conflicts of interest

References

Alacha, H. F., & Lefler, E. K. (2021). Negative Halo Effects in Parent Ratings of ADHD, ODD, and CD. *Journal of Psychopathology and Behavioral Assessment*, *43*(3), 466–477. https://doi.org/10.1007/S10862-020-09860-1/TABLES/4

Arnett, A. B., Pennington, B. F., Willcutt, E. G., Defries, J. C., & Olson, R. K. (2015). Sex differences in ADHD symptom severity. *Journal of Child Psychology and Psychiatry*, *56*(6), 632–639. https://doi.org/10.1111/JCPP.12337

Attention deficit hyperactivity disorder: diagnosis and management NICE guideline. (2018). www.nice.org.uk/guidance/ng87

Biederman, J., Mick, E., Faraone, S. v., Braaten, E., Doyle, A., Spencer, T., Wilens, T. E., Frazier, E., & Johnson, M. A. (2002). Influence of gender on attention deficit hyperactivity disorder in children referred to a psychiatric clinic. *American Journal of Psychiatry*, *159*(1), 36–42. https://doi.org/10.1176/APPI.AJP.159.1.36/ASSET/IMAGES/LARGE/J09F1.JPEG

Busse, R., Orvain, J., Velasco, M., Perleth, M., Drummond, M., Jørgensen, T., Jovell, A., Malone, J., & Wild, C. (2002). BEST PRACTICE IN UNDERTAKING AND REPORTING HEALTH TECHNOLOGY ASSESSMENTS Working Group 4 Report Prepared for and in close collaboration with the working group by. *International Journal of Technology Assessment in Health Care*, *18*(2), 361–422.

Clinkenbeard, P. R. (1991). *Beyond summary: Constructing a review of the literature. - PsycNET*. https://psycnet.apa.org/record/1991-98247-002

Conrad, P., & Bergey, M. R. (2014). The impending globalization of ADHD: Notes on the expansion and growth of a medicalized disorder. *Social Science & Medicine*, *122*, 31–43. https://doi.org/10.1016/J.SOCSCIMED.2014.10.019

Danielson, M. L., Bitsko, R. H., Ghandour, R. M., Holbrook, J. R., Kogan, M. D., & Blumberg, S. J. (2018). Prevalence of Parent-Reported ADHD. *Diagnosis and Associated Treatment Among U.S. Children and Adolescents*, *47*(2), 199–212. https://doi.org/10.1080/15374416.2017.1417860

Emser, T. S., Johnston, B. A., Steele, J. D., Kooij, S., Thorell, L., & Christiansen, H. (2018). Assessing ADHD symptoms in children and adults: Evaluating the role of objective measures. *Behavioral and Brain Functions*, *14*(1), 1–14. https://doi.org/10.1186/S12993-018-0143-X/TABLES/4

Gualtieri, C. T., & Johnson, L. G. (2005). ADHD: Is Objective Diagnosis Possible? *Psychiatry (Edgmont)*, *2*(11), 44. /pmc/articles/PMC2993524/

Hall, C. L., Taylor, J. A., Newell, K., Baldwin, L., Sayal, K., & Hollis, C. (2022). *The challenges of implementing ADHD clinical guidelines and research best evidence in routine clinical care settings: Delphi survey and mixed-methods study*. https://doi.org/10.1192/bjpo.bp.115.002386

Hartung, C. M., Lefler, E. K., Tempel, A. B., Armendariz, M. L., Sigel, B. A., & Little, C. S. (2010). Halo effects in ratings of ADHD and ODD: Identification of susceptible symptoms. *Journal of Psychopathology and Behavioral Assessment*, *32*(1), 128–137. https://doi.org/10.1007/S10862-009-9135-3/TABLES/4

Hinshaw, S. P. (2018). Attention Deficit Hyperactivity Disorder (ADHD): Controversy, Developmental Mechanisms, and Multiple Levels of Analysis. *Https://Doi.Org/10.1146/Annurev-Clinpsy-050817-084917*, *14*, 291–316. https://doi.org/10.1146/ANNUREV-CLINPSY-050817-084917

Lusardi, R. (2019). Current trends in medicalisation: Universalising ADHD diagnosis and treatments. *Sociology Compass*, *13*(6). https://doi.org/10.1111/SOC4.12697

Madsen, K. B., Ravn, M. H., Arnfred, J., Olsen, J., Rask, C. U., & Obel, C. (2018). Characteristics of undiagnosed children with parent-reported ADHD behaviour. *European Child and Adolescent Psychiatry*, *27*(2), 149–158. https://doi.org/10.1007/S00787-017-1029-4/TABLES/5

Minder, F., Zuberer, A., Daniel Brandeis, ·, & Drechsler, R. (2018). A Review of the Clinical Utility of Systematic Behavioral Observations in Attention Deficit Hyperactivity Disorder (ADHD). *Child Psychiatry & Human Development*, *49*, 572–606. https://doi.org/10.1007/s10578-017-0776-2

Mohammad-Reza, M., Hadi, Z., Khaleghi, A., Ahmadi, N., Hooshyari, Z., Seyed-Ali, M., Ameneh, A., Seyyed-Salman, A., Alia, S., & Maryam, S. (2021). Prevalence of ADHD and Its Comorbidities in a Population-Based Sample. *Journal of Attention Disorders*. https://doi.org/10.1177/1087054719886372

Mowlem, F., Agnew-Blais, J., Taylor, E., & Asherson, P. (2019). Do different factors influence whether girls versus boys meet ADHD diagnostic criteria? Sex differences among children with high ADHD symptoms. *Psychiatry Research*, *272*, 765–773. https://doi.org/10.1016/J.PSYCHRES.2018.12.128

Mullet, D. R., & Rinn, A. N. (2015). Roeper Review Giftedness and ADHD: Identification, Misdiagnosis, and Dual Diagnosis. *Roeper Review*, *37*(4), 195–207. https://doi.org/10.1080/02783193.2015.1077910

Mulrow, C., Langhorne, P., & Grimshaw, J. (1997). Systematic Review Series Series Editors: Cynthia Mulrow f MD f MSc Deborah Cook, MD f MSc Integrating Heterogeneous Pieces of Evidence in Systematic Reviews. *Ann Intern Med*, *127*, 989–995. http://www.acponline.org.

Newlove-Delgado, T., Blake, S., Ford, T., & Janssens, A. (2019). Young people with attention deficit hyperactivity disorder in transition from child to adult services: A qualitative study of the experiences of general practitioners in the UK. *BMC Family Practice*, *20*(1), 1–8. https://doi.org/10.1186/S12875-019-1046-0/TABLES/2

NICE. (2013). *Attention deficit hyperactivity disorder Quality standard*. www.nice.org.uk/guidance/qs39

NICE. (2018). *Attention deficit hyperactivity disorder: diagnosis and management NICE guideline*. www.nice.org.uk/guidance/ng87

Peters, M., Godfrey, C., McInerney, P., Munn, Z., Trico, A., & Khalil, H. (2020). Chapter 11: Scoping Reviews. *JBI Manual for Evidence Synthesis*. https://doi.org/10.46658/JBIMES-20-12

Polanczyk, G. v., Willcutt, E. G., Salum, G. A., Kieling, C., & Rohde, L. A. (2014). ADHD prevalence estimates across three decades: an updated systematic review and meta-regression analysis. *International Journal of Epidemiology*, *43*(2), 434–442. https://doi.org/10.1093/IJE/DYT261

Ramtekkar, U. P., Reiersen, A. M., Todorov, A. A., & Todd, R. D. (2010). Sex and Age Differences in Attention-Deficit/Hyperactivity Disorder Symptoms and Diagnoses: Implications for DSM-V and ICD-11. *Journal of the American Academy of Child & Adolescent Psychiatry*, *49*(3), 217-228.e3. https://doi.org/10.1016/J.JAAC.2009.11.011

Sans, J. C., Hidalgo, P. M., Castellvi, J. R., Moreso, V., & Martinez, H. C. (2021). *Prevalence and Epidemiological Characteristics of ADHD in Pre-School and School Age Children in the Province of Tarragona, Spain*. https://journals.sagepub.com/doi/pdf/10.1177/1087054720938866

Sayal, K., Prasad, V., Daley, D., Ford, T., & Coghill, D. (2018). ADHD in children and young people: prevalence, care pathways, and service provision. *The Lancet Psychiatry*, *5*(2), 175–186. https://doi.org/10.1016/S2215-0366(17)30167-0

Simon, V. (2022). *Prevalence and correlates of adult attention-deficit hyperactivity disorder: meta-analysis*. https://doi.org/10.1192/bjp.bp.107.048827

Singh, I., & Wessely, S. (2015). Childhood: a suitable case for treatment? *The Lancet Psychiatry*, *2*(7), 661–666. https://doi.org/10.1016/S2215-0366(15)00106-6

Thongseiratch, T., & Worachotekamjorn, J. (2016). Impact of the DSM-V Attention Deficit Hyperactivity Disorder Criteria for Diagnosing Children With High IQ. *Psychological Reports*, *119*(2), 365–373. https://doi.org/10.1177/0033294116662662

Willcutt, E. G. (2012a). The Prevalence of DSM-IV Attention-Deficit/Hyperactivity Disorder: A Meta-Analytic Review. *Neurotherapeutics*, *9*(3), 490–499. https://doi.org/10.1007/S13311-012-0135-8/TABLES/3

Willcutt, E. G. (2012b). The Prevalence of DSM-IV Attention-Deficit/Hyperactivity Disorder: A Meta-Analytic Review. *Neurotherapeutics*, *9*(3), 490–499. https://doi.org/10.1007/S13311-012-0135-8/TABLES/3

Appendices

Appendix I: Search strategy

Child* OR Youth* OR Adolescen* OR Juvenile* OR Teen* OR Infant* OR Boy* OR Girl* OR Student* OR Pupil*

AND

"ADHD" OR "Attention Deficit/ Hyperactivity Disorder" OR "Hyperactiv*" OR "Inattenti*" OR "Hyperkinetic Disorder" OR "Impulsiv*"

AND

"Behavio* Observation*" OR "Objectiv* Measur*" OR "Objective Assessment" OR "Acceleromet*" OR "Actigraph*" OR "Time Sampling" OR "Systematic Observation*" OR "Classroom Observation*" OR "Direct Observation*" OR "Ecological Momentary Assessment"