

Sleep and ADHD: Incorporating Research into Clinical Practice (A Rapid Systematic Review of the Literature)

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Abstract

Sleep is a critically important topic for individuals with Attention Deficit/Hyperactivity Disorder (ADHD) as well as their therapists, coaches, and healthcare providers. A clear understanding of the interconnectedness between ADHD and sleep is critical as part of comprehensive services provided by practitioners in any setting. This rapid systematic literature review identified 13 studies (published in 2016) that examine the relationship between ADHD and sleep in young adults and adults.

Research Objective

Recent research indicates that the relationship between ADHD and sleep is both complex and bi-directional and can be mediated by a myriad of factors. Understanding the current research on ADHD and sleep helps to inform evidence-based practice and effective interventions. This poster outlines a rapid systematic literature review with the following main research objective: **What is the relationship between ADHD and sleep?**

Method

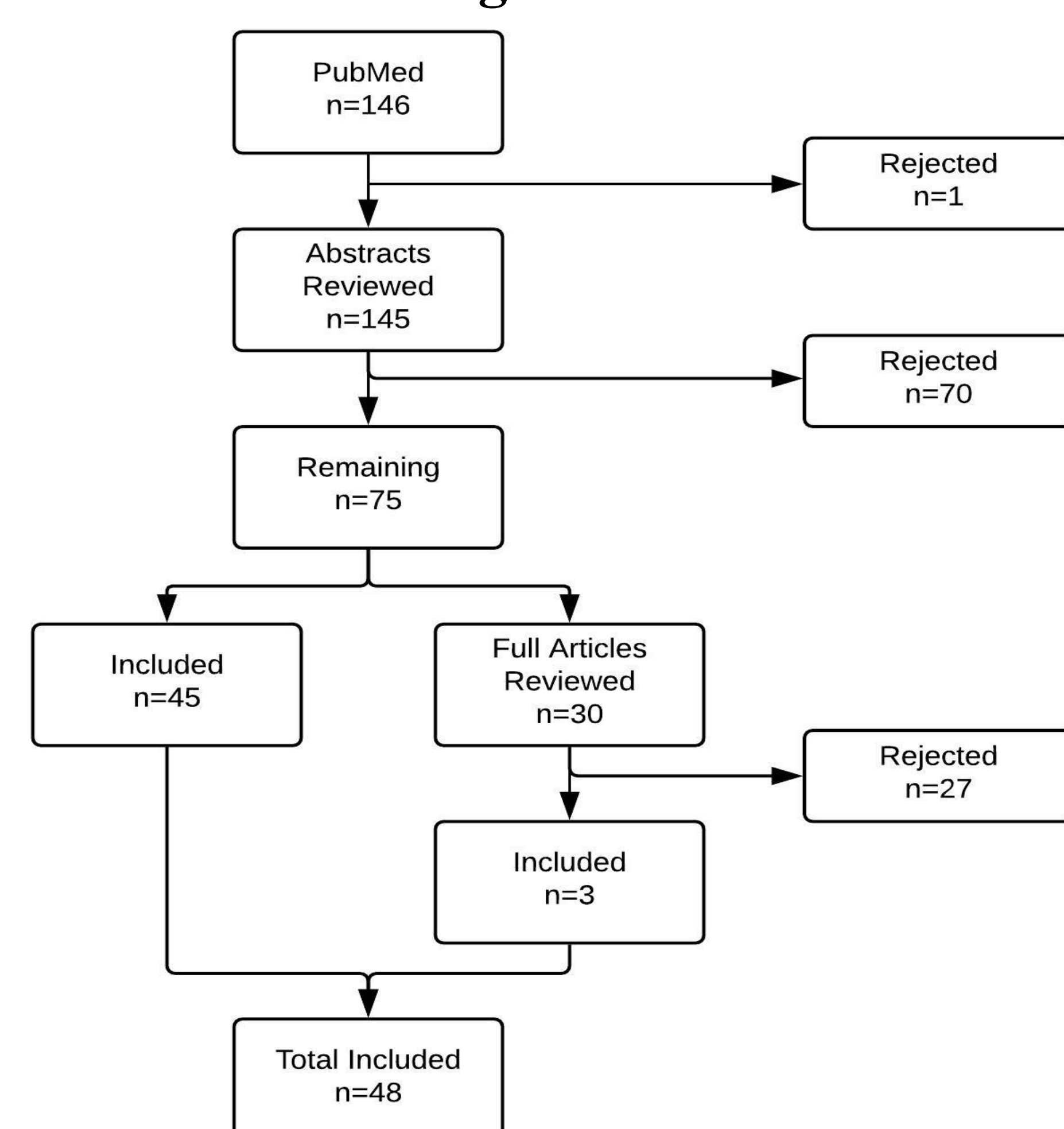
In mid-2017, a rapid systematic literature review was conducted in the PubMed database using the search terms "ADHD" and "Sleep" and "2016". Utilizing a clear, predetermined set of objectives (PICOS), identified studies were sorted in three waves (see Figure 1) based on set inclusion/exclusion criteria (see Box 1). The final group of "accepted" studies was then categorized according to chronological age groups, which were then sub-divided according to the International Classification of Sleep Disorders' (ICSD-3) six major categories of sleep disorders (AASM, 2014) and a seventh category of general findings related to ADHD and sleep (see Table 1 and its note).

Table 1.

Study	Design	n	Control (n)	ADHD Diagnosis	Sleep Measure	ICSD-3
Bioulac et al. (2016)	Prospective study with matched control group	39	18	DSM-IV	PSG ^a , MWT ^b , driving simulation task	3
Bogdan & Reeves (2016)	Cross sectional analysis of NHIS ^c data	1,100	29,130	Self-reported ADHD	Self-reported hours of sleep in a 24 hour period	7*
Bumb et al. (2016)	Cross sectional with control group	74	86	DSM-IV	MRI ^d and Morningness-Eveningness Questionnaire (circadian typology)	4
Cadman et al. (2016)	Longitudinal study (6-year follow up)	85	221	DSM-IV	Sleep disturbance assessed via subscales of the Clinical Interview Schedule-Revised	3
Gregory et al. (2016)	Longitudinal twin cohort study	359 combined total	1,681	DSM-IV, using mother & teacher reports	Pittsburgh Sleep Quality Index	7*
Instanes et al. (2016)	Systematic literature review	126 studies		DSM-5	ICD-10	1, 2, 3, 4, 6
Langberg et al. (2016)	Prospective longitudinal (one school year)	59		DSM-IV	Pediatric Daytime Sleepiness Scale ^e	3
Lin, Yang, & Gau (2016)	Cross sectional with predictive analysis	214	174	DSM-5	Clinical diagnostic interview/self-report	7*
McGowan, Voinescu, & Coogan (2016)	Cross sectional/correlational		396 healthy adults	Adult ADHD Self-Report Scale	Pittsburgh Sleep Quality Index, Munich Chronotype Questionnaire	4
Rogers et al. (2016)	Cross sectional between subjects design	243	86 (CFS ^f); 211 (healthy)	DSM-IV	Chalder Fatigue Scale & Jenkins Sleep Evaluation Questionnaire	3
Snitselaar et al. (2016)	Literature review	19 studies		Varied	Varied	1, 4
Snitselaar, Smits, & Spijker (2016)	Cross sectional/observational	29		ADHD-Rating Scale	Holland Sleep Disorders Questionnaire	1, 2, 3, 4, 5, 6, 7*
Sobanski et al. (2016)	Cross sectional with control group	13	26	DSM-IV, ADHD-Diagnostic Checklist	Epworth Sleepiness Scale, PSG ^a , MSLT ^g	3

Notes: ^aPolysomnography; ^bMean Wakefulness Test; ^cNational Health Interview Survey; ^dMagnetic resonance imaging; ^eValidated self-report measure of daytime sleepiness and academic functioning that has been used in multiple studies with adolescents/young adults; ^fChronic Fatigue Syndrome; ^gMultiple Sleep Latency Test
International Classification of Sleep Disorders (ICSD-3): 1–Insomnia; 2–Sleep Related Breathing Disorders; 3–Central Disorders of Hypersomnolence; 4–Circadian Rhythm Sleep-Wake Disorders; 5–Parasomnias; 6–Sleep Related Movement Disorders; 7*–General findings related to ADHD & Sleep (not an ICSD-3 category)

Figure 1.



Box 1.

Inclusion Criteria:

- English-language publications
- Peer reviewed (most journals indexed for PubMed are peer-reviewed or refereed, but peer review criteria and reviewer or referee qualifications vary)
- All research study designs excluding case studies
- Human subjects
- ADHD & Sleep (or sleep disorder) are the key study variables (independent and dependent)

Exclusion Criteria:

- Independent or dependent variable is ADHD treatment
- Independent/dependent variable a combination of ADHD and other neuropsychiatric disorders or other comorbid mental health conditions

Note: References for this review and for preschool, child, and teenage studies are available upon request.

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Results

A total of 146 studies were identified in this rapid review. After all three waves of review, 48 articles were retained, spanning six age-group categories. Only adult and young adult studies (n=13) were selected to summarize and report on in detail (see Table 1) for three primary reasons: an increasing number of adults are being diagnosed with ADHD, less research has been done in these age groups, and sleep is not as age-dependent in these groups as it is for children and adolescents.

Conclusions

Practitioners will benefit from understanding at least five key findings emerging from these recent research studies: (1) sleep problems can both mimic and exacerbate ADHD symptoms; (2) ADHD may cause or contribute to sleep problems; (3) the impact of ADHD treatment on sleep should be considered; (4) a thorough assessment of sleep is critical for individuals diagnosed with ADHD; and (5) available evidence-based treatment approaches for supporting sleep deserve increased attention. Continued research further examining the physiological and behavioral interconnections between ADHD and sleep will refine and enhance available approaches to intervention and treatment.

Clinical Implications

US & European guidelines:

- Primary sleep disorders should be ruled out before initiating ADHD medication.

Canadian guidelines:

- Attend to sleep concerns when assessing and/or developing treatment plans for ADHD.

Also, a number of strategies can be particularly useful when exploring sleep concerns with a client:

Document:

Gather data about sleep hygiene/patterns via:

- Sleep scales
- Sleep diaries
- Sleep lab studies, if indicated

Educate:

- Educate clients about good sleep hygiene
- Educate about the ADHD/sleep connection
- Educate about the potential impact of medications on sleep and sleep quality

Consider Referrals:

- Refer to managing psychiatrist regarding sleep concerns
- Refer to sleep center for a sleep study to look for potential comorbid sleep disorders (e.g. obstructive sleep apnea)

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