

2024 Tennessee Occupational Therapy Association Annual Meeting
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Pediatric Sleep Assessment & Intervention: Supports for Children and Families

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A significant number of therapists do not address sleep management with their clients and did not feel comfortable recommending interventions due to a lack of confidence, education, and preparedness. A reported lack of knowledge (33.98%) and training (33.83%) were major barriers for addressing sleep dysfunction despite 52.83% of therapists believing in its importance (Poole et al., 2023).

This presentation is linked to a secondary research study to determine if a sleep education program improves therapist knowledge, confidence, and utilization frequency of available sleep evaluations, and potential intervention recommendations, with children who have identified sleep disturbance.

For those occupational therapists who work in pediatric settings and who would like to support this additional research please complete this short survey prior to the presentation. At the end of the program, you will be asked to track your clinical practices for 4 weeks and re-take the survey with data collected. This research protocol has been approved by the UTC Institutional Review Board IRB # 24-103. If you have questions about the research study, you can contact Cindy-Poole@utc.edu or 423-425-5126.



SLEEP EDUCATION EFFICACY IN PEDIATRIC CLINICAL PRACTICE

Key Terms:

- **Sleep:** allows your body and mind to rest, repair, heal, and reorganize; scientifically complex.
- **Sleep Onset Latency-** the delay in going to sleep
- **Sleep Disruption-** night awakening
- **Sleep Diary:** tracking and reporting document for amount and components of sleep
- **Sleep Quality:** Based on ratings of the amount of time it took to go to sleep, # of awakenings, the amount of time awake after going to sleep, and calculated sleep efficiency
- **Sleep Hygiene:** Habits or routines that influence “sleep participation” from OTPF-4
- **NREM Sleep (Non-REM)-3** stages of sleep, each progressively deeper and longer, brain waves slow down but have bursts of electrical energy to organize memories and information. Stage 3 NREM is most important & determines perception of feeling rested. The deepest sleep that repairs injuries and reinforces your immune system. Required for growth in babies.
- **REM Sleep-**Characterized by rapid eye movements, where dreams occur, brain activity looks similar to an awake state, makes up about 25% of your total time asleep. Can last from 10 minutes to 1 hour with length progressing for each cycle.
- **Sleep Efficiency:** Sleep Time /Time in bed x 100= SE (6 hours/9 hours x 100= 67%)
- **Bedtime Resistance-**resistance to prepare for sleep

- **Parasomnias**- disturbing experiences that occur prior to, during, and upon awakening from sleep
- **CBT-I**- Cognitive Behavior Therapy-Insomnia is the most effective intervention
- **Polysomnography**-records your brain waves, the oxygen level in your blood, and your heart rate and breathing during sleep. It also measures eye and leg movements to diagnose sleep disorders.
- **Actigraph**-non-invasive way to measure activity and rest (a special watch)

The research:

- 25-50% of neurotypical children and 50-80% of neurodiverse children experience **sleep-related problems** throughout adolescence (Chen et al., 2021).
- Sleep disruption is one of the **most common comorbidities** in children with Autism Spectrum Disorder (ASD) (Waddington et al., 2020).
- Sleep dysfunction is a **common comorbidity** found in ASD, with a higher prevalence (50-80%) when compared to typically developing children (25%), and other neurodevelopmental disabilities (Down syndrome and Cerebral Palsy at 43%) (Galli et al., 2022).
- Galli et al., (2022) reported that the most common symptom of **sleep disturbances in autism** is insomnia and sleep maintenance. Other than insomnia, parasomnia actions such as sleepwalking, apnea, enuresis, nightmares, and daytime sleepiness are also heavily seen in the ASD population.
- Difficulties with sleep were most commonly **due to “bedtime resistance (25.6%), sleep anxiety (22.7%), sleep onset delay (17.9%) and daytime sleepiness (14.7%)”** (Chen et al., 2021).

Impact of poor sleep:

- Inadequate REM sleep correlation between behavioral problems, permanent sleep disruption, decreased brain mass, and degree of neuronal destruction.
- Health- HBP, poor control of blood sugar, inflammation, obesity
- Daytime Sleepiness impacts occupational disruption
- Hyperactivity, poor impulse control & emotional dysregulation
- Sensory sensitivities, cognitive & executive functioning, learning, attention, school performance, emotional regulation, behavior, & altered family function (Meltzer, et al., 2013; Neumeyer et al., 2019).
- The **duration and quality of sleep** influences our whole well-being, including cognition, mood, memory, metabolism, cardiovascular, and cerebrovascular systems (Ramar et. al., 2021).
- Inadequate sleep can increase the **severity of negative behaviors** common in children with ASD, including decreased emotional and cognitive functioning, and increased incidence of behaviors such as self-injurious behavior, tantrums, and aggression (Waddington et al., 2020).
- Having a sleep disorder may **impact the child’s cognitive functions and emotional regulation abilities**, as well as amplify the core symptoms that present with autism (Posar & Visconti, 2020).

Types of Diagnosed Childhood Insomnia

Behavior Insomnia of Childhood

- Most common 0-5 years
- Must occur at least 3x/week for 3 mos. with significant impairment of function

Insomnia related to sleep onset associations

- Prolonged night waking
- Sleep-related to conditions/routines required to initiate sleep (associations)

Insomnia related to parental limit setting

- Active resistance, delayed onset, lack of rules

Insomnia related to excessive time in bed

- Time in bed exceeds need for sleep

Conditioned Insomnia

- Older child anxiety about sleep duration/quality/shut off the brain stress
- Misperception of actual sleep & predisposing factors that affect sleep

Medical Conditions

Mismatch of Circadian preferences and expected sleep routines

Transient Sleep disturbance- temporary diagnosis

Sleep is an Occupation as approached from a Person-Environment-Occupational Performance (PEOP) Framework

EVALUATIONS

Occupational Profile/unstructured interview (Person, Environment, & Occupational Performance)

Sleep Diary-most common assessment tool (Person, Environment, & Occupational Performance)

- Determine the baseline function
- Identify patterns & routines
- Sleep strategies currently in use
- Time to fall asleep
- Number of nighttime awakenings and duration
- Reasons for waking
- Determine Sleep efficiency

Wrist Actigraph “Watch”- measures motor activity during sleep (Person)

Formal Assessments

Pediatric Sleep & Autism Global Impressions Scale (Person & Occupational Performance)

Developed collaboration with Autism Speaks Autism Treatment Network (AS ATN).

Clinician completed scale used to measure insomnia within children with autism.

- Looks at indicators of insomnia in children with autism (2 parts with 7 questions each) specifically: the child’s ability to fall asleep and remain sleeping independently (e.g., apart from parents), bedtime resistance, sleep onset delay, night awakening, parental satisfaction with their child’s current sleep patterns, family functioning as affected by their child’s current sleep patterns, and clinician’s overall concern with the child’s sleep.
- Available for free online:
<https://depts.washington.edu/dbpeds/Screening%20Tools/Pediatric%20Sleep%20CGI.form.pdf>

Children's Sleep Habits Questionnaire (CSHQ) (Person & Occupational Performance)

- Retrospective, 33-item **caregiver questionnaire** of sleep behaviors for children ages 4-10, Short form 22 items
- 8 subscales used for screening for sleep disorders but not diagnosis
- Caregiver completed screening tool used by clinicians to identify sleeping problems or to study the sleep of children with ASD, ADHD or other mental or physical health difficulties, based on previous week behaviors
- Assesses bedtime resistance, sleep onset delay, sleep duration, sleep anxiety, night waking, parasomnias, sleep disordered breathing, daytime sleepiness
- Downloadable free form: <https://depts.washington.edu/dbpeds/Screening%20Tools/ScreeningTools.html>

Pediatric Sleep Questionnaire (PSQ) (Person)

- The PSQ is a 49 (or 22) item symptom **caregiver questionnaire** that is divided into behavioral, sleepiness, and snoring domains.
- Can be used for patients aged 2–18 years.
- Items ask about snoring frequency, loud snoring, observed apneas, difficulty breathing during sleep, daytime sleepiness, inattentive or hyperactive behavior, on a Likert 3-point scale and takes 20-30 minutes.
- Scores >0.33 are considered positive and suggestive of high risk for a pediatric sleep-related breathing disorder.
- Tool helps clinicians understand what kinds of sleep disorder symptoms that a client is experiencing and determine if further assessment/referral is needed.
- Free for academic or research purposes:
<https://www.thoracic.org/members/assemblies/assemblies/srn/questionnaires/psq.php>

Sleep Disturbance Scale for Children (SDSC) (Person & Occupational Performance)

- **Caregiver reported** 5-point Likert scale questionnaire on behavior frequency for children ages 6-15 including estimates of sleep quantity and onset time. The overall calculated score indicates level of disturbance.
- Evaluates for specific sleep disorders and screening measure of sleep disturbance in 6 categories: Initiating and maintaining sleep, sleep breathing disorders, arousal states and nightmares, sleep-wake transition disorders, excessive sleepiness, and night sweating.
- 10 -15 minutes to complete and found at: [www.med.upenn.edu/cbti/assets/user-content/documents/Sleep%20Disturbance%20Scale%20for%20Children%20\(SDSC\).pdf](http://www.med.upenn.edu/cbti/assets/user-content/documents/Sleep%20Disturbance%20Scale%20for%20Children%20(SDSC).pdf)

INTERVENTIONS: CONSISTENCY IS KEY!

Person: Interventions for night awakening, sleep onset delay, bedtime resistance, duration, & sleep anxiety

Identify the underlying impairment by keeping a sleep diary

- ❖ Sensory Diet/Modulation
 - ❖ Calming activities at bedtime to reduce anxiety & prepare for sleep (three to five quiet activities that take a total of 20 to 45 minutes)
 - ❖ Provision of preferred calming sensory input (brushing, deep pressure, warm bath, weighted blanket, fan, white noise)
 - ❖ Relaxation techniques/training

- ❖ Limitation of visually stimulating activities- “Screen curfew”
- ❖ Comfort clothing
- ❖ Limit liquids and go to the bathroom before bedtime
- ❖ Protein based light snack before bed to reduce night hunger awakening
- ❖ Physical Activity- ensure that child is “tired enough” to go to sleep!
- ❖ Identify, educate, and modify beliefs that contribute to insomnia (CBT-I principles)
- ❖ Association of bedroom for ONLY sleep
- ❖ Alarm set for same time everyday to establish circadian rhythm
- ❖ Time in bed needs to equal actual sleep time +30 minutes (gradual adjustment)
- ❖ Dietary selection-Caffeine (<8 hrs.), food dyes, spices, sugar, comfort foods
- ❖ Limit “awake time” in bed-get up, but do not stimulate brain
- ❖ Predictable bedtime routine (bath, dressing, story, bed)
- ❖ OTC sleep medications: talk to MD & know medication purposes (go to sleep vs. stay asleep)
- ❖ Talk to MD: re stimulant medication
- ❖ Mental Health
 - Increase participation in more meaningful activities
 - Reduce packed extracurricular routines for some down time
 - Physical Activities
 - Limit napping time and space before bedtime
 - Discuss stresses, concerns, worries to validate and correct fears (but not at bedtime)
 - Journal writing/drawing
 - Parent checks- short & simple, reinforce bed routine
 - Meditation, Mindfulness, Yoga, Guided Imagery, Massage
 - ❖ Controlled breathing
 - ❖ Body-scan sensory awareness
 - ❖ Progressive muscle relaxation
 - ❖ Visualization
 - ❖ Free phone applications-Meditation, sounds, etc.

Environment: Interventions for night awakening, sleep onset delay, bedtime resistance, & duration

- Establish safe sleep environment
- Babies: Back to Sleep Guidelines
- Get at least 30 minutes of natural light early in the day
- Sleeping alone vs co-sleeping
- Mattress/pillows & bedding selection
- Sleep position- elevated head, prone vs. supine
- No pets in the bed
- No TV in the bedroom
- No use of bedroom for “time out” or punishment
- Dimming indoor lights as bedtime approaches
- Temperature- 65 degrees
- Sensory Considerations:
 - Light- affects circadian rhythms (sleep- wake cycle)
 - Black out curtains and night lights
 - Eye masks
 - Bedtimes to adjust to Daylight Savings Time
 - Sound-
 - White noise
 - Television in other rooms
 - Noise cancelling headphones

- Olfactory- Lavender, essential oils, diffuser
- Proprioceptive- weighted blanket, compression bed sheets, compression garments
- Tactile- soft stuffed animals, ribbons to rub
- Vestibular- gentle rhythmical rocking

Occupational Performance Considerations: Interventions for night awakening, sleep onset delay, bedtime resistance, duration, & sleep anxiety

- The impact of other occupations on sleep
 - School demands (nighttime activities, homework, early mornings)
 - Social/Leisure – night practices, games, etc.
 - Positive and negative influences for healthy sleep routines
- Nap appropriately (times and length)
- Reward systems
- Task sequence cards
- Social stories to alleviate fears
- Consistency in implementation of previous interventions
- Family dynamics
- The impact of child’s sleep on the family and their occupations
 - Parents or sibling schedule
 - Co-sleeping with siblings or parents

Parent Education: Topics for Training and Education

- ❖ Prevalence: You are not alone!
- ❖ Effects of poor sleep on function
- ❖ Components of healthy sleep habits
- ❖ Consistent Bedtime
- ❖ Sleep promoting pre-bedtime routines
- ❖ Consistency in rules/routines at bedtime/inadvertent reinforcement
- ❖ Avoiding reinforcement of bedtime delay behaviors
- ❖ Expectation of escalation of bedtime resistance
- ❖ Positive reinforcement of desired responses
- ❖ Bedtime Fading: Set bedtime to meet sleep needs
- ❖ Avoid use of light emitting screens for 1 hour prior to bedtime
- ❖ Caregiver education on how to track sleep routines
- ❖ Importance of pre-bedtime organization/sensory diet
- ❖ Environmental modifications for comfort and safety
- ❖ The effect of light on circadian rhythms
- ❖ Relaxation techniques
- ❖ Work on regulation skills during the day first
- ❖ Diagnosis-specific recommendations available on internet
 - ❖ Autism: Stanford (<https://med.stanford.edu/csasd/education/parent-toolkit/parent-interventions.html>)
 - ❖ Cerebral Palsy guidance from NIH- <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4928749/>

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Resources:

National Sleep Foundation <https://www.thensf.org/what-is-sleep-quality/>

Stages of sleep: <https://my.clevelandclinic.org/health/body/12148-sleep-basics>

CBT-I Training:

1. CBT for OT: Colorado State University: <https://www.chhs.colostate.edu/ot/research/restoring-effective-sleep-tranquility/cognitive-behavioral-therapy-for-insomnia-for-occupational-therapy/>
2. PESI Online Course: https://catalog.pesi.com/sales/bh_c_001249_cbti_041718_organic-85242?utm_term=&utm_campaign=US+%7C+BH+%7C+NB+%7C+N/A+%7C+Dynamic+%7C+Performance+Max+%7C+US+%7C+RET&utm_source=google&utm_medium=cpc&hsa_acc=7268932594&hsa_cam=20947151930&hsa_grp=&hsa_ad=&hsa_src=x&hsa_tgt=&hsa_kw=&hsa_mt=&hsa_net=adwords&hsa_ver=3&gclid=Cj0KCQjwlvW2BhDyARIsADnle-I6VCclons8AqDMcoaOtX3Thi9QVpMfsnCJLwOqWj1_eD0K_uiJ6v0aAnqFEALw_wcB&gclid=aw.ds

Thank you! We are hopeful to gain valuable research data to demonstrate the effectiveness of education as a powerful tool to improve outcomes for children with sleep dysfunction and Occupational Therapy Pediatric clinical practices.

Stay tuned....

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