Sleep Disturbances in Children with ASD: Topography and Treatment Strategies

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Clinical Approach: Pragmatism and Parsimony

- Behavior change plans should be:
 - Simple and reasonable
 - Match context
 - Resources
 - –Time, \$, staff, emotional investment (hope!), etc.
 - Child & Caregiver Factors
 - -Temperament
 - -Cognitive and adaptive skills
 - Motivation

Learning Objectives

- Identify the topography and prevalence of sleep problems in ASD.
- Develop an understanding of the medical, developmental and behavioral factors that contribute to the emergence and maintenance of these concerns.
- Identify assessment procedures and behavioral treatment strategies for common sleep disturbance in ASD.
 - This will include a primer on behavioral assessment and intervention

Autism Spectrum Disorder (ASD)

• DSM – 5:

Neurodevelopmental disorder(s) of unknown genetic origin where symptoms unfold over the first few years of life:

- Persistent deficits in social communication and social interaction
- -Restrictive, repetitive patterns of behavior, interests, or activities

Rates of Co-Morbid Behavior Concerns

- As many as 70% of children with ASD present with challenging behaviors, including aggression, self-injury, and disruptive behavior (Lesack et al., 2014)
- Up to 90% of children with ASD might experience some type of feeding problem (Ledford & Gast, 2006)
- 50% of children with ASD experience toileting issues (Whiteley, 2004)
- 50-80% of children with ASD display sleep problems (Richdale & Schreck, 2009 ; Souders et al., 2009)

Communication

- Children with ASD often present with limited verbal communication
- As a result, problem behaviors may:
 - Function as a means to express wants/needs
 - Serve to avoid unpleasant event that are seemingly innocuous to others
 - Emerge without clear environmental influence
 - Underlying medical concerns?

Adaptations for ASD

 By constructing treatments that involving persisting with a reasonable demand, the use of antecedentbased interventions allows for consideration to the unique cognitive and behavioral profile associated with ASD (e.g. resistance to change and heightened sensory defensiveness).

Overarching Goal

- 1) Increasing the likelihood of the child making contact with _____(remaining in bed) + reinforcement
- 2) While concurrently reducing the probability of an extreme behavioral response associated with intervention
- 3) Increasing the likelihood of implementation in the home/school environment

Evidenced-Based Practices in ASD

BEHAVIORISM 101

Behavioral Intervention

- 1) Environmental Events Critical in Shaping Behavior
 - Unit of Analysis is Behavior
 - Importance of Context: Three-Term Contingency
- 2) Systematic Data Collection Guides Decision Making
 - Use of Operational Definitions
 - Direct Observation of Target Behaviors

What does this mean?

- Learning involved in most behaviors
 - -Behavior should be viewed as *functional*
 - "It works" to get something
 - Problem behaviors (e.g., hitting, screaming, elopement) serve a function
 - Not an issue of "good" or "bad"
 - Best viewed: Adaptive or maladaptive

4 Possible Functions of Behavior

Socially Mediated-

- 1) Escape: "Get away" From aversive event or stimuli
 - Task, people, place
- 2) Tangible: "Give me" Preferred item
 - Toy, food, video
- 3) Attention: "Pay attention to me"
 - Peer, caregiver, parent

4 Possible Functions of Behavior

Automatic-

- 4) Sensory: "I like the way that feels" Not person, location, or event specific
 - Movements or activities of your body that produce a feeling that makes the behavior that produced it more likely.
 - May present in children with ASD as:
 - Self-stimulatory behavior (a.k.a., stimming)
 - Self-injury

Focus of intervention is on changing behavior

- Positive and negative reinforcement/punishment refer to the impact on behavior versus:
 - Social appropriateness
 - Type of consequence

Focus of intervention is on changing behavior

- Punishment Decrease Behavior
- Reinforcement Increase Behavior
- "I reinforced Ryan"
 - Not increasing or decreasing children

Behavior

- Anything the organism does
- Includes:
 - Actions
 - Responses
 - Thoughts and feelings
 - Verbal and non-verbal events





Extinction



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- Reduction in behavior after reinforcement is removed
- Behavior stops or occurs much less frequently because it is no longer reinforced

Sleep



- Behavioral insomnia in childhood (International Classification of Sleep Disorders, 2nd edition)
 - "Repeated difficulty with sleep initiation, duration, consolidation, or quality that occurs despite age-appropriate time and opportunity for sleep, and results in daytime functional impairment for the child or family"

Topography and Prevalence

- Trouble:
 - Falling sleep
 - Staying asleep
 - Poor quality of sleep -> Daytime sleepiness
- Results in behavioral, academic, and/or other daytime function
- Co-sleeping

Typical Sleep Patterns/Requirements

Sleep requirements and distribution of sleep stages vary by age:

- Total hours needed declines:
 - Newborns: 13.2 hours (range: 10 to 18)
 - 2-year olds: 11.4 hours (range: 10 to 13)
 - Adults: 9 10 hours/night
- Napping:
 - Vary among individuals, cultural, and social factors
 - Most children stop napping by 5; few children require a nap past 6-7 years

Development of Sleep Patterns

- Sleeping through the night (midnight to 5 AM)
 - Occurs for most babies by 12 weeks
 - Failure to develop nighttime sleeping predictive of night waking
- Nocturnal awakenings normal part of the sleep process:
 - Infants (3 to 12 months) = 1.3 times per night
 - Toddlers (12 months to 3 year) = .73 times per night
- Infants fall into 2 general categories:
 - "self-soothers" Return to sleep on their own
 - "signalers" Require parental intervention

Antecedent Aspects of Sleep

- Routine
- Bedroom
- Caregivers
- Hunger / Thirst
- Sleepiness

Bedtime Behaviors

- Stay in bed
- Fall asleep
- Remain asleep / in bed until morning

- Crying
- Disruptions
- Elopement

Consequences

- Escape
 - Bed
 - Room
- Attention
 - Caregivers remain in room
- Co-sleeping

Sleep - Assessment

- Clinical interview:
 - Bedtime routine
 - Timing and consistency of bedtime activities
 - Child's behavior
 - Bedroom environment Temp, cleanliness, co-sleeping, light and noise
 - Nocturnal behavior
 - Frequency, duration, and parent response to awakenings
 - Enuresis, nightmares, or night terrors

Sleep Chart/Diary

DAY	Mid night	2 AM	4 AM	6 AM	8 AM	10 AM	Noon	2 PM	4 PM	6 PM	8 PM	10 PM	
	_												
SAT													
SUN													
MON													
TUES													
WED													
THURS													
FRI													

Sleep Chart/Diary

- Provides a detailed, often visual, tracking of a 24 hour sleep-wake cycle
- Directions:
 - 1.) Put an X to mark the time you put your child to bed or to nap
 - 2.) Shade the time your child was asleep
 - 3.) Leave blank the times when he/she was awake
 - 4.) Put a U to mark the time your child got up in the morning or after a nap.

Caregiver worksheet - Routine

Bedtime Problems: Tracking the Bedtime Routine



We start getting ready for bed at: __:__ PM

Then we.....

1.)	
2.)	
3.)	
4.)	
5.)	
6.)	
7.)	
8.)	
	falls asleep by: PM

BEARS (Owens & Dalzell, 2005)

- The questions vary for age and accordingly are directed at the parent, child, or both.
- Examples of items :
 - 1.) <u>Bedtime problems</u>: Does your child have any problems at bedtime?
 - 2.) <u>Excessive daytime sleepiness</u>: Does your child have difficulty waking in the morning, seem sleepy during the day or take naps?
 - 3.) <u>A</u>wakenings during the night: Does your child wake up a lot at night? Any sleepwalking or nightmares?
 - 4.) <u>R</u>egularity and duration of sleep: What time does your child go to bed and get up on school days? Weekends? Do you think he/she is getting enough sleep?
 - 5.) <u>S</u>leep-disordered breathing: Does your child have loud or nightly snoring or any breathing difficulties at night?

Actigraph



Device resembling a wristwatch that records activity patterns and can estimate sleep parameters

Behavioral Intervention for Sleep Problems in ASD



Table 1: Behavioral Interventions for Sleep Problems in Children and Adolescents

- Extinction: elimination of parental attention as a reinforcer for undesired behaviors (i.e., protesting at bedtime)
 - Unmodified extinction ("cry it out" approach): parents put the child to bed at a designated bedtime, and then ignore protest behaviors such as tantrums until a preset time the next morning
 - Modified or "graduated" extinction ("Ferber method", "sleep training"): a variety of techniques in which parents are typically instructed to ignore bedtime crying and tantrums for specified periods of time and which involve gradual shaping of appropriate behaviors and fading of interventions
- Positive routines: parents develop a set and consistent bedtime routine quiet and calming activities that the child enjoys; last portion is preferred activity and takes place in sleeping environment
- Bedtime fading: temporarily delay of bedtime to ensure rapid sleep initiation; bedtime is then moved earlier by small increments (i.e., 15 minutes) over successive nights ("fading") until pre-established bedtime goal is achieved
- Sleep restriction: limits the amount of time in bed to actual sleep time
 - Define optimal sleep length as goal
 - Set initial time in bed to current average total sleep time
 - Get up at the same time every day
 - Increase time in bed by small increments (15 20 minutes/week) when sleep efficiency (total sleep time/time in bed) is greater than 90%
- Stimulus control: reinforcement of the association between bed and bedtime with sleep rather than with wakefulness
 - Use bed for sleep only
 - Go to bed only when sleepy
 - If sleep onset (or waking during the night) is greater than 20-30 minutes, get out of bed and engage in a non-stimulating activity (i.e., reading a boring book) until drowsy
 - Avoid naps

Vriend et al. (2011)

- 15 studies identified
- All involved establishing good sleep hygiene/parent education + other behavioral elements:
 - Standard extinction (3 studies)
 - Graduated extinction (2 studies)
 - Scheduled awakenings (1 study)
 - Fading bedtime / sleep restriction (5 studies)
 - Stimulus fading (1 study)
 - Chronotherapy (1 study)
 - Multi-component (2 studies)

Sleep hygiene and Positive Bedtime Routines

- Recommendations to set the stage for sleep:
 - Bedtime routine
 - Length
 - Activities (to do / avoid)
 - Consistency
 - Prompts
 - Bedroom environment
 - Clean room
 - Night light
 - White noise maker
 - Sense of possession

Routine and Consistency

- Same time
- Same activities
- Calm and peaceful
- Avoid potential conflicts
- Have a set response for getting out of bed
- Routine checks (10 minute) are recommended

Standard extinction

- A.k.a. "letting the child cry out"
 - Promotes self-soothing
- Steps: Put the child in bed/crib and ignore all crying and misbehavior
- Pros:
 - Demonstrated to eliminate bedtime tantrums and/or night time waking
 - Increased likeability, security, and emotionality
- Cons:
 - Protocol drift
 - Difficult to ignore
 - Parental stress

Graduated extinction

- A.k.a. Progressive approach, Ferber (1985) method
- Steps:
 - Place child in bed
 - If child is crying/fussy, check back for brief period after 5 minutes
 - Do not pick up the child or try to console
 - Increase the length of time between check-ins
 - Each night, gradually increase the length of time before the initial check and between checks

Check-In Schedule

		If your child is still crying								
Day	At First Wait	Second Wait	Third Wait	Subsequent Wait						
1	5	10	15	15						
2	10	15	20	20						
3	15	20	25	25						
4	20	25	30	30						
5	24	30	35	35						
6	30	35	40	40						
7	35	40	45	45						

Source: Ferber (1985)- Solve Your Child's Sleep Problems

Graduated extinction

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- Steps:
 - Place child in bed
 - If child is crying/fussy, check back for brief period after 5 minutes
 - Do not pick up the child or try to console
 - Increase the length of time between check-ins
 - Each night, gradually increase the length of time before the initial check and between checks
- Pros:
 - May increase adherence, parental satisfaction, treatment acceptability
- Cons:
 - May initially teach a child to cry longer (extinction burst)

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Fading bedtime / sleep restriction

Steps:

- Select a bedtime when your child is likely to fall asleep with little of no difficulty within about 15 minutes.
- If your child falls asleep within 15 minutes of being put to bed at this new bedtime and without resistance for two consecutive nights, then move back bedtime 15 minutes (e.g., from 1:30 AM to 1:15 AM).
 - _____ PM 15 minutes = _____ PM New Bedtime
- Repeat step #3-- Continue to move back the bedtime by 15 minutes (e.g., from 1:15 AM to 1:00 AM) as directed under #3 until the desired bedtime is reached.
- Child also awakened at the same time each morning and not allowed to sleep outside proscribed sleep times.
- Pros :
 - Potential for few problem behaviors
- Cons:
 - Time consuming

Stimulus fading

- Parent remains in the room with the child
- May involve:
 - Increasing distance from child
 - Fading time in room
 - Sleeping in a separate bed
- Pros:
 - Potential for few problem behaviors
- Cons:
 - Time consuming

Bedtime Pass

Can be used for one more snuggle, kiss, cup of water, or extra tuck-in

Safety Concerns







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Case Example #1



- R.E.
 - 7 year old male with ASD
 - History of difficulty falling asleep, as well as frequent waking
 - Established (Rigid) bedtime routine:
 - Soothing activities Bath, books
 - Parent would then lie next to R.E. in bed until he fell asleep
 - Extreme tantrums: Crying, whining, disruption, and leaving the bed when parent attempted to leave the room
 - When he woke at night, he would go and wake parent and request that she return to his room or would request breakfast or play (if light – approximately 5 AM)
 - Impact on child and parent functioning throughout the day

Case Example #2

- E.S.
 - E.S. is a 4 year old girl who often does not fall asleep until 10:30 pm, although her bedtime begins around 7:30 pm each night.
 - Activities before bed vary and sometimes include watching TV, eating a snack, and taking a bath. Sometimes her parents stay and talk to her for up to 30 minutes.
 - E.S. willingly gets into bed and remains there for about 10 minutes before getting up and looking for her parents.
 - When her parent take her back to her room, she often tantrums before settling back into bed. This pattern often repeats 4 to 5 times per night.

Designing the Intervention

- Possible function
- Initial treatment target
- Treatment elements
- Steps
- Data
- Decision rule

Reference - Sleep

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