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An Interprofessional, Tailored Behavioral Intervention for Sleep Problems in Autism: Use of Sensory Data to Inform Intervention

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**Background**

Prevalence of ASD has increased to 1 in 68 children (CDC, 2014). Chronic severe insomnia (sleep disturbance) is one of the most common co-occurring conditions in children with ASD (60-80%) (Liu et al., 2006; Souders et al., 2009; Wiggs & Store, 2004).

Causes are multifactorial including behavioral, biological and cultural mechanisms (Kotagal & Broomall, 2012; Malow & McGrow, 2008). Parents report that both sensory sensitivities (to the environment) and anxiety may be contributing factors (Souders et al., 2009).

OCCUPATIONAL THERAPY: Interprofessional sleep interventions for two participants as part of an interprofessional, tailored behavioral intervention for sleep problems in autism: chronic severe insomnia (sleep disturbance) as one of the most common co-occurring conditions in children with ASD (60-80%) (Liu et al., 2006; Souders et al., 2009; Kotagal & Broomall, 2012; Malow & McGrow, 2008).

Parents report that both sensory sensitivities (to the environment) and anxiety may be contributing factors (Souders et al., 2009). Occupational therapists can address these factors and help improve sleep quality by implementing sensory and environmental strategies.

**Purpose**

The purpose of this poster is to demonstrate how Sensory Profile data informed occupational therapy sleep interventions for two participants as part of an interprofessional, tailored behavioral intervention study.

**Methods**

Comparative Effectiveness Design

Eligibility Criteria:

- Autism Dx (ADOS)
- Insomnia (CSHQ, Actigraphy)
- Ages: 6-10

Consent & Administer Measures:

- Assessed for Eligibility
- ATN Sleep Tool Kit Education (Mallow, 2008)
- Medical Assessment & Sleep History
- Randomized 1:10

Tailored Behavioral Intervention (TARI) + ATN Sleep Tool Kit (8 Home Visits + Follow up)

1. Behavioral Strategies
2. Calming Module Activities Selected
3. Additional Environmental Adaptations & Calming Strategies

**Measures:**

- Anxiety Measures: Pediatric Anxiety Rating Scale
- Sensory Measures: Sensory Profile
- Sleep Measures: Sleep Diary, Child Sleep Habits Questionnaire (CSHQ), Actigraphy

**Case 1: Male, 9 years-old**

<table>
<thead>
<tr>
<th>Sensory Profile Subscale</th>
<th>Typ. Perf.</th>
<th>Prob.</th>
<th>Def.</th>
<th>Diff.</th>
<th>Specific behaviors noted from parent report on Sensory Profile</th>
<th>Strategies used to improve sleep</th>
</tr>
</thead>
<tbody>
<tr>
<td>Auditory Processing</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td>Sensitivity; Distracted around high levels of noise</td>
<td>Quiet sleep environment</td>
</tr>
<tr>
<td>Visual Processing</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td>Heavy blanket; Calming Module activities during hour before bed: Observing Your Breath, Yoga Poses for Insomnia, Progressive Muscle Relaxation</td>
<td></td>
</tr>
<tr>
<td>Vestibular Processing</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td>Movement seeking behaviors</td>
<td></td>
</tr>
<tr>
<td>Touch Processing</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td>Earlier nighttime hygiene routine to offset arousal</td>
<td></td>
</tr>
<tr>
<td>Multisensory Processing</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td>Sensitivity to tooth brushing and some fabrics; Seeking behaviors for certain textures</td>
<td></td>
</tr>
<tr>
<td>Oral Sensory Processing</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td>Attention difficulties; Unaware in busy environment; Hangs on people or objects</td>
<td>Decrease stimuli in sleep environment (minimal toys)</td>
</tr>
<tr>
<td>Sensory processing related to endurance/ tone</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td>Decreased endurance; Tires easily</td>
<td>Increase activity level during day/after school</td>
</tr>
<tr>
<td>Modulation related to body position and movement</td>
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<td></td>
<td></td>
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<td></td>
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<tr>
<td>Modulation of movement affecting activity level</td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>Modulation of sensory input affecting emotional responses</td>
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</tr>
<tr>
<td>Modulation of visual input affecting emotional responses and activity level</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Emotional/social response</td>
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<td></td>
<td>Parent education</td>
<td></td>
</tr>
<tr>
<td>Behavioral outcome of sensory processing</td>
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<td></td>
<td></td>
<td></td>
<td>Difficulties with changes in routine</td>
<td>Use of visual schedule &amp; bedtime pass</td>
</tr>
<tr>
<td>Items indicating thresholds for response</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td>Use of visual schedule and behavioral intervention</td>
<td></td>
</tr>
</tbody>
</table>

**Case 1 Outcomes**

**Pre Intervention Sleep Behavior**

- Sleeps with parents
- Increased sleep latency (28 minutes to fall asleep)
- Wakes during night/restless (47 sleep minutes; 117 wake minutes)
- Wakes at 5am

**Post Intervention Sleep Behavior**

- Sleeps in own room
- Decreased sleep latency (21 minutes)
- Decreased waking during night (585 sleep minutes; 65 wake minutes)
- Wakes at 5-6am with dad

**Actigraphy Example**

![Image of actigraphy example with data from case 1 participant.

**Case 2: Male, 8 years-old**

<table>
<thead>
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<td></td>
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<td>Quiet sleep environment</td>
</tr>
<tr>
<td>Visual Processing</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td>Some difficulty with visual discrimination</td>
<td>Simple visual schedule; Use of verbal cues</td>
</tr>
<tr>
<td>Vestibular Processing</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td>Movement seeking behaviors</td>
<td>Increase activity level/ heavy work exercises after school; Deep pressure massage before bed; Calming Module activities during hour before bed: Observing Your Breath, Yoga Poses for Insomnia; Quiet Reading</td>
</tr>
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<td>Touch Processing</td>
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<tr>
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<td></td>
<td></td>
<td></td>
<td>Use of visual schedule and behavioral intervention</td>
<td></td>
</tr>
</tbody>
</table>

**Case 2 Outcomes**

**Pre Intervention Sleep Behavior**

- Sleeps in own room
- Increased sleep latency (47 minutes to fall asleep)
- Wakes during night/restless (209 sleep minutes; 65 wake minutes)
- Early bedtime/early wake time

**Post Intervention Sleep Behavior**

- Sleeps in own room
- Decreased sleep latency (12 minutes)
- Decreased waking during night (51 sleep minutes)
- Later bedtime/later wake time
References


