Interventions for Sleep Problems in Pediatrics

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Interventions for Sleep Problems in Pediatrics

May 2017

This evidence project, submitted by
Chelsea Rogers, Marie Trevisan, & Maureen Traxler, OTS

has been approved and accepted
in partial fulfillment of the requirements for the degree of
Master of Science in Occupational Therapy from the University of Puget Sound.

Project Chairperson: Renee Watling, PhD, OTR/L, FAOTA

OT635/636 Instructors: George Tomlin, PhD, OTR/L, FAOTA; Renee Watling, PhD, OTR/L, FAOTA

Director, Occupational Therapy Program: Yvonne Swinth, PhD, OTR/L, FAOTA

Dean of Graduate Studies: Sunil Kukreja, PhD

Key words: Sleep problems, Pediatrics, Sleep interventions
INTERVENTIONS FOR SLEEP PROBLEMS IN PEDIATRICS

Abstract

Julie Anderson, DrOT, OTR/L, will be conducting screenings and providing treatment for children with sleep problems in the Puyallup School District of Washington. To assist her in this emerging practice area, a systematic search and critical appraisal of research published between 2000 and January, 2017 was completed to address the question, “What is the current evidence regarding sleep intervention effectiveness in school-aged children?” The majority of research has investigated the use of behavioral interventions for improving child sleep. These studies included children with developmental disabilities (DD), attention deficit hyperactivity disorder (ADHD), autism spectrum disorder (ASD), oppositional defiant disorder (ODD), sensory modulation disorder (SMD), visual impairment, and typically developing children. Few studies addressed occupationally-based performance outcomes and thus it is recommended that future studies monitor these areas.

To translate the knowledge from this research into practice, an educational pamphlet and PowerPoint presentation were created for pediatricians on the importance of sleep health, how to screen for sleep problems, and intervention strategies beyond medication. These materials promote awareness of sleep health on occupational performance and describe the role of occupational therapy in this area. Monitoring of this translational project will be conducted by Dr. Anderson via survey when she begins advocating for sleep health in the community. Recommendations for future translation of information would be to create a manual for clinicians, parents, and educators with instruction regarding behavioral interventions.
Executive Summary

This project began in the fall of 2016 with the creation of the first critically appraised topic (CAT) paper. Together with a local pediatric occupational therapist, Dr. Julie Anderson, a research question was formulated to answer a question regarding pediatric sleep problems and evidence to support current sleep interventions. This was a problem the clinician was seeing in the field that was not being addressed by occupational therapists or other health professionals. The original question had three parts to it: how many children suffered from pediatric sleep problems, what was the best way to screen for these problems, and how were these issues being treated? In considering what research would be most beneficial for Dr. Anderson’s practice, the research question became “what is the current evidence regarding sleep intervention effectiveness in school-aged children?”

To collect data, a systematic search of databases was conducted to find articles that met the inclusion criteria. Journal archives searched included AJOT, CJOT, BJOT, OTseeker, ERIC, PsycINFO, PubMed, CINAHL, and NCEE. Search terms included, child, sleep, and intervention. Our search results yielded close to 10,000 articles, of which 21 were chosen to be included in the CAT paper. A CAT table was compiled using the 21 articles. Findings were reviewed by a supervising researcher and categorized by topic and analyzed to summarize implications for practice. Three meta-analyses, 8 randomized control trials, 2 controlled clinical trials, 3 single subject studies, 1 case control study, 2 one group pre-post study, 1 multiple case study, and 1 individual case study were analyzed for this review. Studies included in the CAT table used behavioral, sensory, school-wide policy, and media use interventions. Behavioral interventions consistently resulted in improved sleep performance and school-wide interventions also showed positive outcomes for participants. There was insufficient evidence for healthy media-use and
INTERVENTIONS FOR SLEEP PROBLEMS IN PEDIATRICS

sensory approaches in treating sleep problems but outcomes warrant further research in these areas.

Research indicates that sleep interventions can improve sleep in both typically developing children and those with developmental disorders (DD), autism spectrum disorders (ASD), sensory modulation disorders (SMD), attention deficit hyperactivity disorder (ADHD), oppositional defiant disorder (ODD), and visual impairments. Interventions were constantly tailored to consider the needs of both the child and the family and parents were consistently involved in treatment implementation. No matter the intervention, what seemed to be most important was that parents were supported in the implementation of intervention. For every study included in the CAT, parent education and parent implementation of intervention were part of the treatment. These findings are promising and suggest that pharmaceutical interventions are not always needed to treat sleep disorders in children. Further research and evidence is needed to determine the impact of sleep interventions on areas of performance beyond sleep and should be conducted within the field of occupational therapy.

Upon revisiting the topic with Dr. Anderson, she requested a pamphlet be created for pediatricians in the local area. We created a pamphlet to disseminate the findings of our research and to educate physicians on the prevalence of pediatric sleep problems, the importance of screenings, and the potential of non-pharmacological interventions for improvement of sleep problems in children. A presentation was also created that was meant to be a supplemental outline for her to use to advocate for sleep health within the community. Dr. Anderson has not yet utilized our product and thus outcomes have not been measured.
Focused Question:
What is the current evidence regarding sleep intervention effectiveness in school-aged children?

Collaborating Occupational Therapy Practitioner:
Julie Anderson, DrOT, OTR/L

Prepared By:
Chelsea Rogers, Marie Trevisan & Maureen Traxler

Chair:
Renee Watling, PhD, OTR/L, FAOTA

Course Mentor:
Renee Watling, PhD, OTR/L, FAOTA

Date Review Completed:
11/14/16

Clinical Scenario:
Dr. Anderson works as an occupational therapist (OT) in an elementary school that houses a preschool for children with developmental delays and other disabilities including autism, ADHD and Down’s Syndrome. Her district also utilizes the Response to Intervention (RTI) approach to implement general education programs for all the children at the school. She has a hypothesis that the general school population, particularly the preschoolers, does not get adequate or appropriate sleep each night, which impacts their academics and behavior. She is interested in screening her students and creating an intervention to address their sleep problems while collaborating with teachers and parents. This CAT outlines current sleep interventions and their effectiveness to inform Dr. Anderson of best practice as she creates an intervention focusing on her preschool population and then possibly expanding it to the broader public school district.

Review Process:
Procedures for the selection and appraisal of articles

Inclusion Criteria:
Limit to preschool and elementary aged children, articles including birth to age 13 if they include target population age, articles published after 2000, both children with and without developmental delays (comorbidities acceptable unless listed in exclusion criteria), interventions based in schools or homes, interventions that can be implemented by school or by caregivers in the home.

Exclusion Criteria:
Published in non-peer-reviewed journal, non-nighttime sleep (i.e. napping), medication interventions, children with serious sleep disorders requiring medical intervention (e.g. sleep apnea), articles with the majority (80%) of referenced articles published before 2000, children with a DSM-V diagnosis (except for ASD, learning disabilities, anxiety symptoms, sensory modulation disorder, ADHD and oppositional defiance disorder (ODD) which are acceptable as primary diagnoses or co-morbidities), articles reviewed by meta-analyses or systematic reviews that are already included in the CAT table, hospitalized children, children with chronic pain, persons older than 13, articles focusing only on children ages 0-3.

Search Strategy

<table>
<thead>
<tr>
<th>Categories</th>
<th>Key Search Terms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Client Population</td>
<td>School-aged children, preschool, children, school-based</td>
</tr>
<tr>
<td>Intervention</td>
<td>Sleep interventions available within current research, child sleep intervention, sleep intervention, sleep treatment, preschool sleep intervention, school sleep intervention, early intervention</td>
</tr>
<tr>
<td>Comparison</td>
<td>N/A</td>
</tr>
<tr>
<td>Outcomes</td>
<td>Efficacy and availability of sleep interventions for school-aged children</td>
</tr>
</tbody>
</table>

Databases and Sites Searched
Quality Control/Review Process:

Searching began by exploring databases, using a variety of pre-defined search terms such as, “school based sleep intervention,” and “preschool aged sleep intervention.” As the preliminary searches turned up few results, we began simplifying the search terms and expanding the inclusion criteria to include children of all elementary school ages. Inclusion and exclusion criteria were further updated after receiving feedback from peer members and the course mentor but the research question itself was not refined. After a large number of articles were found (19 through reference tracking alone), exclusion criteria were adjusted to ensure our information was the most recent possible. This specified exclusion of all articles of which the majority of references were written pre-2000, were also added to the exclusion criteria, which reduced the article count to its current number.

In total 24 articles were included in the CAT and 3,044 were excluded. Most articles were rejected because they included information on sleep, such as prevalence of sleep problems or descriptive research on typical sleep patterns, but did not provide primary evidence on specific sleep interventions. Other reasons for rejection included: publication prior to 2000, the article was
a review or meta-analysis of articles published prior to 2000, interventions included medicinal
treatments, subjects were older than 13 years of age, subjects had serious sleep disorders, the
article was already included from a previous search, the article was reviewed in an included meta-
analysis, subjects were hospitalized children, subjects had diagnosis listed in our exclusion criteria.

There were several mentors involved in the review process that informed the decisions of the
three student researchers. Renee Watling, PhD, OTR/L, FAOTA, is both the course mentor and
project chair. George Tomlin, PhD, OTR/L, FAOTA, helped focus the direction of the research
question during the preliminary stages of defining the CAT topic and provided access to numerous
resources throughout the search process. The team of peers that reviewed the proposal also
provided insightful critique that helped in refining the search strategy and defining the topic in
general.

**Results of Search:**

**Table 1. Search strategy of databases**

<table>
<thead>
<tr>
<th>Search Terms</th>
<th>Date</th>
<th>Database</th>
<th>Initial Hits</th>
<th>Articles Excluded</th>
<th>Total Selected for Review</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sleep</td>
<td>9/19/16</td>
<td>The National Center for Education Evaluation and Regional Assistance (NCEE)</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Child Sleep Intervention</td>
<td>9/22/16</td>
<td>Primo Library</td>
<td>644</td>
<td>643</td>
<td>1</td>
</tr>
<tr>
<td>Sleep intervention AND preschool</td>
<td>10/4/16</td>
<td>ERIC</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Sleep treatment AND preschool</td>
<td>10/4/16</td>
<td>ERIC</td>
<td>2</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Sleep intervention</td>
<td>10/4/16</td>
<td>ERIC</td>
<td>5</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Preschool sleep intervention</td>
<td>10/8/16</td>
<td>SLEEP</td>
<td>81</td>
<td>80</td>
<td>1</td>
</tr>
<tr>
<td>Child sleep intervention</td>
<td>10/8/16</td>
<td>Pubmed</td>
<td>1045</td>
<td>1044</td>
<td>1</td>
</tr>
<tr>
<td>sleep, tag: early intervention</td>
<td>10/13/16</td>
<td>AJOT</td>
<td>4</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>Sleep Intervention</td>
<td>Date</td>
<td>Database</td>
<td>Cited</td>
<td>Relevant</td>
<td>Duplicate</td>
</tr>
<tr>
<td>-----------------------------------------------------------------------------------</td>
<td>-----------</td>
<td>----------</td>
<td>-------</td>
<td>----------</td>
<td>------------</td>
</tr>
<tr>
<td>Child Sleep</td>
<td>10/17/16</td>
<td>BJOT</td>
<td>266</td>
<td>266</td>
<td>0</td>
</tr>
<tr>
<td>Child Sleep Intervention</td>
<td>10/17/16</td>
<td>BJOT</td>
<td>227</td>
<td>227</td>
<td>0</td>
</tr>
<tr>
<td>Preschool Sleep</td>
<td>10/17/16</td>
<td>BJOT</td>
<td>12</td>
<td>12</td>
<td>0</td>
</tr>
<tr>
<td>Sleep Intervention</td>
<td>10/17/16</td>
<td>CJOT</td>
<td>75</td>
<td>75</td>
<td>0</td>
</tr>
<tr>
<td>Child Sleep</td>
<td>10/17/16</td>
<td>CJOT</td>
<td>76</td>
<td>76</td>
<td>0</td>
</tr>
<tr>
<td>Preschool Sleep</td>
<td>10/17/16</td>
<td>CJOT</td>
<td>10</td>
<td>10</td>
<td>0</td>
</tr>
<tr>
<td>Sleep intervention; limiters: year (2000-2016), age (2-12), group (human)</td>
<td>10/17/16</td>
<td>PsycINFO</td>
<td>128</td>
<td>120 (*6)</td>
<td>2</td>
</tr>
<tr>
<td>Child Sleep Intervention</td>
<td>10/19/16</td>
<td>OTseeker</td>
<td>8</td>
<td>8</td>
<td>0</td>
</tr>
<tr>
<td>Child Sleep</td>
<td>10/19/16</td>
<td>OTseeker</td>
<td>13</td>
<td>12</td>
<td>1</td>
</tr>
<tr>
<td>Preschool Sleep</td>
<td>10/19/16</td>
<td>OTseeker</td>
<td>2</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>School Sleep</td>
<td>10/19/16</td>
<td>OTseeker</td>
<td>5</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>Child AND sleep intervention</td>
<td>10/19/16</td>
<td>CINAHL</td>
<td>101</td>
<td>98 (*2)</td>
<td>1</td>
</tr>
<tr>
<td>School sleep</td>
<td>10/19/16</td>
<td>CINAHL</td>
<td>149</td>
<td>146 (*3)</td>
<td>0</td>
</tr>
<tr>
<td>Child AND Sleep Treatment</td>
<td>10/19/16</td>
<td>CINAHL</td>
<td>165</td>
<td>162 (*3)</td>
<td>0</td>
</tr>
<tr>
<td>Child AND sleep AND treatment OR intervention; limiters: years (2016-2017), age (childhood)</td>
<td>1/20/17</td>
<td>PsycINFO</td>
<td>3,621</td>
<td>3,620</td>
<td>1</td>
</tr>
<tr>
<td>Child AND Sleep AND Treatment OR Intervention OR Therapy (11/2016-1/2017)</td>
<td>1/23/17</td>
<td>ERIC</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Child AND Sleep AND Treatment OR Intervention OR Therapy (11/2016-1/2017)</td>
<td>1/23/17</td>
<td>OT Seeker</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>
Table 2. Articles from reference tracking.

<table>
<thead>
<tr>
<th>Article</th>
<th>Date</th>
<th>Articles Referenced</th>
<th>Articles Excluded</th>
<th>Total Selected for Review</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corkum, Lingley-Pottie, Davidson, McGrath, Chambers, et al. (2016)</td>
<td>10/9/16</td>
<td>45</td>
<td>39</td>
<td>5</td>
</tr>
<tr>
<td>Persch, Braveman, Metzler (2013)</td>
<td>10/16/16</td>
<td>45</td>
<td>44</td>
<td>1</td>
</tr>
</tbody>
</table>

Total number of articles used in review from reference tracking = 9

Total number of articles used in review from database searches = 12

Total number of articles used in review from reference tracking = 9

Total number of articles used in CAT = 21

Summary of Study Designs of Articles Selected for the CAT Table

<table>
<thead>
<tr>
<th>Pyramid Side</th>
<th>Study Design/Methodology of Selected Articles</th>
<th>Number of Articles Selected</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental</td>
<td>_3_Meta-Analyses of Experimental Trials&lt;br&gt;_8_Individual Randomized Controlled Trials&lt;br&gt;_2_Controlled Clinical Trials&lt;br&gt;_3_Single Subject Studies</td>
<td>16</td>
</tr>
<tr>
<td>Outcome</td>
<td>Description</td>
<td>Count</td>
</tr>
<tr>
<td>------------------------------</td>
<td>-----------------------------------------------------------------------------</td>
<td>-------</td>
</tr>
<tr>
<td><strong>_3.Meta-Analyses of Related Outcome Studies</strong></td>
<td>Individual Quasi-Experimental Studies</td>
<td>6</td>
</tr>
<tr>
<td><strong>_1.Case-Control Studies</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>_2.One Group Pre-Post Studies</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Qualitative</strong></td>
<td></td>
<td>0</td>
</tr>
<tr>
<td><strong>_3.Meta-Syntheses of Related Qualitative Studies</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>_Small Group Qualitative Studies</strong></td>
<td>brief vs prolonged engagement with participants</td>
<td></td>
</tr>
<tr>
<td><strong>_triangulation of data (multiple sources)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>_interpretation (peer &amp; member-checking)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>_a posteriori (exploratory) vs a priori (confirmatory) interpretive scheme</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>_Qualitative Study on a Single Person</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Descriptive</strong></td>
<td></td>
<td>2</td>
</tr>
<tr>
<td><strong>_3.Systematic Reviews of Related Descriptive Studies</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>_Association, Correlational Studies</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>_1.Multiple Case Studies (Series), Normative Studies</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>_1.Individual Case Studies</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Comments:**
This count contains meta-analyses that reviewed multiple articles with different study designs.

**AOTA Levels**
I- 12
II- 1
III- 2
IV- 6
V-
### Table Summarizing the Evidence for School Based Interventions

<table>
<thead>
<tr>
<th>Author, Year, Journal Abbreviation</th>
<th>Study Objectives</th>
<th>Study Design/ Level of Evidence</th>
<th>Participants: Sample Size, Description, Inclusion, Exclusion Criteria</th>
<th>Intervention &amp; Outcome Measures</th>
<th>Summary of Results</th>
<th>Study Limitations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gruber, Somerville, &amp; Bergmame, 2016, SM</td>
<td>To evaluate a school based sleep intervention’s effectiveness at increasing sleep and academics in children.</td>
<td>Non-randomized controlled before-and-after study</td>
<td>Public school children in Montreal: N=74 children; girls=41; boy =33; ages=7-11 (mean=8.46). 71 remaining (tx=46, control=25) Inclusion: students from 3 English speaking public schools in Montreal (2 participant schools and 1 control) Exclusion: mental illness, sleep disorder or learning disability, or DD.</td>
<td>I: 6 wk developmentally appropriate, experiential learning based curriculum for children, tools and education for parent and teacher involvement, support for school principals to assess school design and policy O: actigraph for TST, efficiency, latency, and changes to grades.</td>
<td>There were no significant differences in demographics, baseline sleep measures (mean duration =9.4h, SD=58 min) or baseline academic performance b/w tx or control groups. Improvements in TST, efficiency, latency and academic performance for tx group, control group showed no change.</td>
<td>Study may be influenced by other variables, i.e. unequal levels of parent motivation/involvement; requirement for collaboration of parents, teachers, principals and other services providers may not be feasible for a single OT to coordinate.</td>
</tr>
<tr>
<td>Li et al., 2013, PLOS One</td>
<td>Efficacy of intervention on sleep outcomes and school performance for children of school age</td>
<td>Comparative cross-sectional analysis</td>
<td>N=525 children in Shanghai elementary schools aged 10. Tx group 1; N1=215; girls=104; boys=111, tx group 2; N2=152; girls=71; boys=81, control group; n=158; girls=79, boys=78 Inclusion: Children at chosen elementary schools of correct age whose parents returned the permission form</td>
<td>I: Delay school start time by 30 minutes (tx group 1), or 60 minutes (tx group 2). O: QSHQ, TSAF</td>
<td>Significant improvement in length of sleep and daytime sleepiness for both tx groups. Tx group 2 had greater than group 1 improvements but differences were not statistically significant. Control group showed decrease in TST and increase in daytime sleepiness.</td>
<td>Parent report subjective, no baseline data for TSAF or QSHQ, large sample size affects significance levels of small effect sizes</td>
</tr>
</tbody>
</table>
### Table Summarizing the Evidence for Behavioral Interventions

<table>
<thead>
<tr>
<th>Author, Year, Journal Abbreviation</th>
<th>Study Objectives</th>
<th>Study Design/ Level of Evidence</th>
<th>Participants: Sample Size, Description, Inclusion, Exclusion Criteria</th>
<th>Intervention &amp; Outcome Measures</th>
<th>Summary of Results</th>
<th>Study Limitations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Burke, Kuhn, &amp; Peterson, 2004, JPP</td>
<td>To evaluate efficacy and acceptability of using rewards and a social story to reduce negative bedtime behavior and night waking in children</td>
<td>Single-subject multiple-baseline design</td>
<td>4 Children aged 2-7 (mean age = 5.25); 2 males</td>
<td>I=Parents read <em>The Sleep Fairy</em> after bedtime routine; reward under child’s pillow if sleep through whole night O=Sleep diaries w/ bedtime data forms &amp; checklists</td>
<td>All children showed reduced disruptive behavior and NW during treatment retained at 3-month follow-up. Sleep onset improved for all children during tx. Only one maintained improvements at 3-month follow-up. TST was improved for 2 children at 3-month follow-up. CBC improved for 3 of 4 children which was retained at 3-month</td>
<td>Small sample size, lack of randomization, and no control group.</td>
</tr>
<tr>
<td>Author(s)</td>
<td>Efficacy of a sleep tx and increased point earnings on neutralizing sleep difficulty for a child w/ ODD on a contingency management system</td>
<td>Male child, aged 9 w/ ODD and mild cognitive impairment; no eligibility requirements included</td>
<td>1st baseline: mean sleep=6.81hrs/nt &amp; 20/36 points on token system; 1st tx: mean sleep=8.43hrs/nt &amp; 28/36 points; 2nd baseline: mean sleep=6.5hrs/nt &amp; 14.5/36 points; 2nd tx: mean sleep= 7.95hrs /nt &amp; 29.5/36 points on system; increased sleep correlated w/ better behavior per parent diary and author/teacher direct observation</td>
<td>Parent acceptability high.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
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<td>---</td>
<td>---</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cautilli &amp; Dziewolska, 2004, JEIBI</td>
<td>To determine the effectiveness of a distance intervention on children’s sleep and psychosocial functioning</td>
<td>N=61, tx=31, control=30; no dem. differences b/w groups Inclusion: ages 5-12, trouble falling asleep w/ or w/o resistance, sleep problems occur &gt;1 month, w/ impairment to daily functioning of child and/or parent Exclusion: mod to severe cognitive impairment, neuro or mental health dx, previous experience in behavior sleep tx, night enuresis, sleep apnea, child regularly sleeps w/ parent</td>
<td>Actigraphy: effectiveness but low adherence (45.2%); all outcome measures showed improvement at posttest and maintained at 6-month follow-up for tx group; parent satisfaction rated over 4.5/5 for all parents. No control group changes reported.</td>
<td>Unplanned study (began as a consulting case for the first author), small sample size, no direct measure of child’s behavioral performance, no control group</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Corkum, Lingley-Pottie, Davidson, McGrath, Chambers, Mullane, Laredo, Woodford, &amp; Weiss, 2016, JPP</td>
<td>To examine whether behavioral strategies for improving children’s sleep problems could</td>
<td>N=244, boys=208, tx=122, age=5-12yrs Inclusion: ADHD dx, onset pre-7yrs, impairment in 2+ settings, parent rated mod-severe sleep problems, met AASM criteria for 1+ dx</td>
<td>Family reports include improvements in ADHD symptoms, sleep, behavior, QOL, working memory, daily functioning, and fewer days late. Teachers reported improved class</td>
<td>Low adherence rate, parents unable to be blind to tx, primary outcomes based on parent report, no record of concurrent tx, potential low generalizability of study, posttest given too soon after tx, poor adherence to actigraphy lowers power for those analyses</td>
<td></td>
<td></td>
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<tr>
<td>Hiscock, Sciberras, Mensah, Gerner, Efron, Khano, &amp; Oberklaid, 2015, BMJ</td>
<td>2 face to face consultations, 1 phone follow-up, education materials regarding information on normal sleep, sleep cycles, sleep cues, sleep hygiene and</td>
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# Child Sleep Interventions

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<tr>
<th>Study</th>
<th>Design</th>
<th>Inclusion</th>
<th>Exclusion</th>
<th>Intervention</th>
<th>Outcome</th>
<th>Notes</th>
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<tbody>
<tr>
<td>Keshavarzi, Bajoghli, Mohamadi, Salmanian, Kirov, Gerber, et al., 2014, WIBP</td>
<td>Randomized case-control trial, pretest &amp; posttest</td>
<td>ADHD dx, 8-13, no serious medical or mental health dx, parent ADHD &amp; behavioral reports</td>
<td>hx of perinatal disorder or CNS disease, respiratory or inflammatory disease, somatic sleep disorder</td>
<td>Sleep schedules and routines altered for each child, wkly phone consults; control group attended 1 meeting on general sleep hygiene w/ wkly phone updates</td>
<td>i=Sleep schedules and routines altered for each child, wkly phone consults; control group attended 1 meeting on general sleep hygiene w/ wkly phone updates</td>
<td>No sleep assessments given, small sample sizes, limited information given on control outcomes, no cognitive or ADHD assessments given, potential rater bias based on outcome expectations, study included children on methylphenidate</td>
</tr>
<tr>
<td>Meltzer &amp; Mindell, 2014, JPP</td>
<td>Meta-analyses</td>
<td>published in peer-reviewed journal, primary aim use of behavioral tx involving behavioral principles, min sample of 12, in English, TD and special needs children. Articles of AOTA levels I, III, IV, and Pyramid levels E3, E2, O3, O4</td>
<td></td>
<td>I: behavioral or psychoeducational tx w/ behavioral principles. O: sleep-onset latency, # of NW, duration of NW, sleep efficiency. Articles analyzed using GRADE criteria</td>
<td>Interventions showed significant improvements on sleep-onset latency, NW frequency and duration w/ less evidence for school aged children; GRADE criteria shows majority of articles are low-quality</td>
<td>Beyond scope of review to assess non-sleep measures, lack of studies focusing on the non-TD population, not many longitudinal studies, reviewers discussed a need for standardized outcome &amp; objective measures</td>
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<tr>
<td>Mullane &amp; Corkum, 2006, JAD</td>
<td>Single-subject, nonconcurrent multiple baseline design</td>
<td>ADHD &amp; dyssomnias, aged 6-10, male=1</td>
<td></td>
<td>I: Randomly assigned to 1, 2 or 3wk baseline followed by 5wk tx, parents received chapter from BNBD each wk along w/ exercises and a phone follow-up</td>
<td>For all 3 children dyssomnia reduced from clinically significant to normal, also reduction in BD and co-sleeping patterns; no change in ADHD symptoms or TST;</td>
<td>Did not compare to control group or children who take medication for ADHD, small sample, incorporated multiple behavioral strategies</td>
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<tr>
<td>Study</td>
<td>Type</td>
<td>Pyramid</td>
<td>Study Design</td>
<td>Inclusion</td>
<td>Exclusion</td>
<td>Intervention</td>
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<tr>
<td>Papadopoulos, Sciberras, Hiscock, Mulraney, McGillivray &amp; Rinehart, 2015, JAD</td>
<td>Efficacy of behavioral sleep intervention on children with both ASD and ADHD</td>
<td>E4</td>
<td>Randomized controlled trial</td>
<td>N=61 children aged 5-13; n=28, ADHD, 86% male; n=33, ADHD and ASD, 91% male. Inclusion: dx of ADHD, ADHD diagnosed before age 7, ADHD rating scale IV, 6+ score on hyperactivity scale, meet criteria for behavioral sleep disorder. Exclusion: Serious medical condition, sleep apnea dx, intellectual disability, receiving specialized sleep intervention</td>
<td></td>
<td>I: Two sleep consultations two weeks apart with follow up phone call. First consultation; assessment of child sleep problems and parent goals, education on sleep and behavioral strategies. Second consultation; assess adherence, progress and troubleshoot problems. O: ADHD rating scale, CSHQ, PedsQL, DASS, SDQ</td>
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<tr>
<td>Richdale &amp; Wiggs, 2005, IJBCT</td>
<td>To review behavioral tx for sleep problems in children with DD, specifically addressing sleeplessness, sleep wake rhythm disorders</td>
<td>E1</td>
<td>Meta-analysis</td>
<td>N= 22 tx for sleeplessness Inclusion: empirical research of behavioral therapy in tx of sleep disturbance for children with DDs aged 2-13. Articles summarized include single case designs, AOTA level IV and nonrandomized group designs AOTA level II.</td>
<td></td>
<td>I=faded bedtime, extinction, graded extinction, fixed interval attention, stimulus fading, desensitization, sleep restriction, individually tailored tx, faded bedtime w/response cost, sleep scheduling, social stories, relaxation activities, parent education, O= sleep problems, daytime behavior (specific target behaviors and classroom conduct), TST, NW, settling behaviors, co-sleeping, parental satisfaction and approval, nighttime disturbances, mother’s sleep satisfaction, sleep</td>
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<tr>
<td>Sadeh, Gruber &amp; Raviv, 2003, CD</td>
<td>Assess the effects of moderate sleep duration changes on NBF in children</td>
<td>Randomized controlled experimental design</td>
<td>N=77 (N=72 final), 39 boys, 38 girls; Inclusion: participation in previous study, recruited from regular classes: fourth grade (n = 42, M age = 9.80 years, SD = .64) and sixth grade (N = 35; age: M = 11.58 years, SD =.50). Exclusion: acute or chronic physical illness, use of medication, reported developmental or psychiatric disability</td>
<td>I: 40 children put to bed 1 hour earlier and 37 put to bed 1 hour later than regular bedtime O: actigraphy; NBF</td>
<td>Children who went to bed earlier fell asleep earlier. Sleep extension led to increased sleep duration, night waking, and to decreased sleep % and fatigue. Opposite for sleep restriction. Sleep extension group improved performance on motor speed and reaction time, visual attention, response inhibition, motor reaction time, working memory, and attention compared to baseline, sleep restriction and no change groups.</td>
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<tr>
<td>Vervloed, Hoevenaars &amp; Mass, 2003, JVIB</td>
<td>Use of graduated extinction on night waking for 4-year old girl with visual impairment</td>
<td>AB single case-study design</td>
<td>4-year old girl with visual impairment</td>
<td>I: 3-month intervention: maximum 30 min bedtime routine, sleep in own bed alone, graded extinction O: Parent interview, sleep diary, Wiggs &amp; Stores Sleep Questionnaire for Children with Severe Learning Disabilities</td>
<td>Decrease in NW. No improvement in sleep latency. Parent report improved child daytime mood and behavior.</td>
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The results show that sleep problems may be a result of behavioral problems even if the child has existing medical or developmental diagnoses.
**CHILD SLEEP INTERVENTIONS**

<table>
<thead>
<tr>
<th>Author, Year, Journal Abbreviation</th>
<th>Study Objectives</th>
<th>Study Design/ Level of Evidence</th>
<th>Participants: Sample Size, Description, Inclusion, Exclusion Criteria</th>
<th>Intervention &amp; Outcome Measures</th>
<th>Summary of Results</th>
<th>Study Limitations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vriend, Corkum, Moon &amp; Smith, 2011, JOPP</td>
<td>To examine behavioral interventions for sleep problems in children with ASD</td>
<td>Meta-analysis AOTA: I Pyramid: O1, E1</td>
<td>N=15 Inclusion: written in English and reported efficacy of behavioral intervention for sleep problems in children with ASD aged 3.5-12 years. Articles of single subject design AOTA levels I, II, IV</td>
<td>I: Sleep hygiene, extinction, schedule awakenings, faded bedtime, sleep restriction, faded bedtime, stimulus fading, chronotherapy, multi-component behavioral tx O: NW, self-settling, co-sleeping, sleep onset latency, waking related self-injurious behavior, daytime behavior, bedtime disturbances, parent satisfaction</td>
<td>No interventions classified as well established. Only standard extinction and scheduled awakenings met criteria for probably efficacious. Sleep hygiene is a commonly included tx considered necessary but not sufficient component of sleep tx. Insufficient evidence of efficacy on faded bedtime, graduated extinction, stimulus fading and chronotherapy</td>
<td>Overall very thorough documentation of research process and included research. Could be improved by including articles published in non-English languages.</td>
</tr>
<tr>
<td>Williams, Sears, &amp; Allard, 2006, JDPD</td>
<td>Establish parent report of most effective sleep interventions they have tried with their children</td>
<td>Descriptive survey AOTA: IV Pyramid: D3</td>
<td>N=500 parents of children with ASD. Inclusion: families with children with ASD who had tried sleep tx for child Exclusion: none listed</td>
<td>I: Survey of behavioral sleep interventions and sleep medications. O: Sleep survey</td>
<td>Behavioral sleep tx tried by at least 65%. Most effective behavioral tx regular bedtime. Other txs rated most helpful by &gt; 60%=child placed in parents bed, wrap child in blanket, noise maker.</td>
<td>No description of sampling method, only 40% survey return rate, survey data subjective parent report</td>
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</table>

**Table Summarizing the Evidence for Sensory Approaches**

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<tbody>
<tr>
<td>Spira, 2015, DAI</td>
<td>Investigate sensory intervention on sleep behaviors and social participation of children with SMD; characterize association of sleep problems</td>
<td>Random experimental design AOTA: I Pyramid: E3</td>
<td>N= 50 children with SMD and sleep difficulties, ages 6-11; Inclusion: sleep and sensory difficulties; Exclusion: dx of ASD, mental retardation, genetic, orthopedic, neurological and psychiatric disorders; use of meds; other OT</td>
<td>I: nightly moderate pressure massage from parents for 20 min, 5-7x/wk for 3 wks O: TST, onset delay, duration &amp; anxiety, NW, parasomnias, bedtime resistance, sleep disordered breathing, daytime sleepiness, anxiety,</td>
<td>Weak link between SMD and behavioral sleep disorders. Significant improvement in sleep behaviors, improvements lost with cessation of tx. No influence on total sleep time.</td>
<td>Geographically, culturally limited participants, convenience sampling, non-blinded, variability of pressure of touch during tx could confound results, additional diagnoses</td>
</tr>
<tr>
<td>Author, Year, Journal Abbreviation</td>
<td>Study Objectives</td>
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<td>Malow et al., 2014, JADD</td>
<td>Determine whether group or individual parent education is more effective for sleep improvements in children with ASD</td>
<td>Randomized Controlled Study</td>
<td>N=80; males=39, white=33; individual tx= 47, group tx=33. Inclusion: Aged 2-10, ASD dx, sleep onset latency of 30 mins 3/7 nights/wk, tolerate actigraphy, English speaking, screened for medical conditions. Exclusion: Children with co-occurring disabilities</td>
<td>I: Group (2 2-hour sessions) or individual (1 1-hr. session) parent education sessions. Parents given homework and two follow-up phone calls. O: QSHQ, FISH, CBC, RBS-R, PedsQL, PSOC, post-intervention survey, actigraphy, sleep diary</td>
<td>No significant difference in outcomes between group and individual tx groups. Significant improvements in sleep latency and behavioral subscales in both tx groups.</td>
<td>No group not receiving tx, no check-up to see if parents made changes, behavioral outcome data subjective,</td>
</tr>
<tr>
<td>Malow, et al., 2016, CPPP</td>
<td>Pilot research examining effectiveness of mailed home program on sleep in children with ASD</td>
<td>One group pre/post-test</td>
<td>N=10 children, ages 3-9 w/ ASD and insomnia, tx group=8, following 2 dropouts</td>
<td>I: mailed home sleep program w/ 5 weeks of incremental interventions including sleep education manual and behavioral specific tools O: parent education, NW, co-sleeping, sleep resistance, SOD, actigraphy, CSHQ, FISH, PAS</td>
<td>8 of 10 completed program; Parent most frequently implemented strategies included bedtime routine w/ visual schedule (n=9); reducing use of electronic device before bed (n=5); and optimizing interactions with the child at bedtime or during NW (n=5). 6 of 8 children improved in at least one sleep domain</td>
<td>Unclear why 2 families dropped program; small sample size; no indication of which families will respond to self-directed program</td>
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</table>
Table Summarizing the Evidence for Healthy Media Use

<table>
<thead>
<tr>
<th>Author, Year, Journal Abbreviation</th>
<th>Study Objectives</th>
<th>Study Design/ Level of Evidence</th>
<th>Participants: Sample Size, Description, Inclusion, Exclusion Criteria</th>
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<th>Summary of Results</th>
<th>Study Limitations</th>
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<tbody>
<tr>
<td>Garrison &amp; Christakis, 2012, PEDS</td>
<td>Efficacy of a program promoting healthy media use on sleep quality of preschool children</td>
<td>Randomized controlled trial</td>
<td>AOTA: I Pyramid: E2</td>
<td>565 children aged 3-5 from 1 geographic area. Treatment group, N= 276; female=45%; minority ethnicity=18%; low income=18%. Control group n=289; female=46%; minority ethnicity=19%; low income=13%. Inclusion: Media users, English-speaking parents, age 3-5 Exclusion: None given</td>
<td>I: In-home discussion of child’s media use, education to replace violent/age inappropriate media use educational media. Monthly letter promoting appropriate shows based on family’s available networks. Monthly phone call to track progress and problem solve. Control group received nutritional intervention to promote healthy eating. O: CSHQ subtests: sleep latency, nightmares, NW, morning waking, daytime tiredness</td>
<td>Intervention group showed improvement in sleep outcomes compared to control group but not statistically significant</td>
</tr>
</tbody>
</table>
Key to Abbreviations:

Abbreviation, Full Phrase

AASM, American Academy of Sleep Medicine
ABA, Applied behavior analysis
AJOT, American Journal of Occupational Therapy
ACARD, Albany Center for Autism and Related Disorders
ADHD, Attention deficit hyperactivity disorder
ASD, Autism Spectrum Disorder
BD, Bedtime disturbances
BI, Behavioral Interventions
BMJ, British Medical Journal
CBC, Child Behavior Checklist
CD, Child Development
CPPP, Clinical Practice in Pediatric Psychology
CPRS, Conners’ Parent Rating Scale
CSHQ, Child Sleep Habits Questionnaire
DAI, Dissertation Abstracts International
DASS, Depression Anxiety Stress Scale
DD, Developmental disabilities
Dem, Demographics
Dx, Diagnosis
ECBI, Eyberg Child Behavior Inventory
FADD, Focus on Autism and other Developmental Disabilities
FISH, Family Inventory of Sleep Habits
I, Intervention
ISQ, Intervention Satisfaction Questionnaire
JABA, Journal of Applied Behavior Analyses
JAD, Journal of Attention Disorders
JDPD, Journal of Developmental and Physical Disabilities
JEIBI, Journal of Early and Intensive Behavior Intervention
JIA, Journal of Intellectual Disabilities
JPBI, Journal of Positive Behavior Interventions
JPP, Journal of Pediatric Psychology
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JPR, Journal of Psychosomatic Research
JSN, The Journal of School Nursing
Min, Minimum
NBF, Neurobehavioral functioning
NES, Neuropsychological Evaluation System
NJD, Nordic Journal of Psychiatry
NW, Night waking
O, Outcome
ODD, Oppositional Defiant Disorder
OT, Occupational therapy
PAS, Parent absorption scale
PEDS, Pediatrics
Peds-QL, Parent Report of Pediatric Quality of Life Inventory
PRBM, Psychology Research and Behavior Management
PSOC, Parenting Sense of Competence Scale
PSSQ, Parent Sleep Satisfaction Questionnaire
RBS-R, Repetitive Behavior Scale Revised
QOL, Quality of life
SDSC, Sleep Disturbances Scale for Children
SDQ, Strengths and difficulties Questionnaire
Sig, Significant
SM, Sleep medicine
SMD, Sensory modulation disorder
SOD, Sleep onset delay
SPM, Sensory Processing Measure
SSP, Short Sensory Profile
SSR, Self-Sleep Report
TD, Typically developing
Tx, Treatment
TSAF, Teacher School Achievement Form
TST, Total sleep time
W/, With
WJBP, The World Journal of Biological Psychology
Wk, wks, Week, weeks
**Summary of Key Findings:**

**Summary of Studies Taking Place in Schools**

<table>
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<tr>
<th>Study</th>
<th>Outcome</th>
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<tr>
<td>Three studies implemented sleep interventions in schools. Significant improvements were found in:</td>
<td>Sleep duration, parent self-knowledge, self-efficacy and attitudes, and academic scores. Interventions included delaying school by 30 or 60 minutes (Li et al., 2013), education to parents, and curriculum given to students within the classroom using pre-developed programs addressing sleep routines, sleep hygiene, lifestyle to promote healthy sleep, and sleep needs (Wilson Miller, Bonuck, Lumeng &amp; Chervin, 2014; Gruber, Somerville, &amp; Bergmane, 2016).</td>
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<tr>
<td>These studies show that school based sleep interventions may result in improved sleep duration, parent knowledge, academic performance, and that the whole family can be positively influenced by child sleep interventions. These results demonstrate the effectiveness of Tier I interventions within the school community to improve not only sleep quality for the children but their academic performance as well. All studies reported the limitation of reliance on subjective parent data that may not be reliable.</td>
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**Summary of Studies Implementing Behavioral Approaches**

The majority of studies assessed the effectiveness of behavioral approaches. Almost all interventions resulted in positive outcomes for the children and families regardless of the behavioral strategies used as long as the parents were active in implementation (Burke, Kuhn, & Peterson, 2004; Cautilli & Dzwolska, 2004; Corkum, et al., 2016; Hiscock, et al., 2015; Keshavarzi, et al., 2014; Meltzer & Mindell, 2014; Mullane & Corkum, 2006; Papadopoulas, et al., 2015; Richdale & Wiggs, 2005; Sadeh, Gruber & Raviv, 2003; Vervloed, Hoevenaars & Mass, 2003; Vriend, Corkum, Moon & Smith, 2011; Williams, Sears & Allard, 2006). These approaches can be delivered with direct professional-to-parent training (Meltzer & Mindell, 2014), as well as with phone consultations with explicit training resources (Corkum et al., 2015). Outcomes include improved child sleep, decreased problem settling behaviors, decreased night waking, decreased co-sleeping, increased psychosocial functioning (emotions and behaviors), increased mother’s sleep, and decreased daytime napping. Most study participants
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maintained improvements in post-intervention follow up measures; however, few studies assessed maintenance after 6 months or looked directly at changes in daytime function, and if it was included, it was assessed via parent report without direct or objective assessment.

Meta-analyses of behavioral approaches conclude that extinction interventions have the most evidence for improving sleep for typically developing children (Meltzer & Mindell, 2014), those with DD (Richdale & Wiggs, 2005) and those with ASD (Vriend, Corkum, Moon & Smith, 2011). Other types of strategies used include social stories, faded bedtime with response cost, graded extinction, fixed interval attention, stimulus fading, positive reinforcement, social, sleep restriction, and response cost. Few studies looked at introduction of sleep hygiene (including routines) separate from behavioral approaches, though limited evidence suggests it may be insufficient to improve sleep in children with DD (Richdale & Wiggs, 2005) or children with ASD (Vriend, Corkum, Moon & Smith 2011).

Summary of Studies Implementing Sensory Approaches

Only one study that fit the inclusion criteria utilized a sensory approach to treating sleep challenges in school aged children. In a randomized control trial done by Spira, (2015), nightly moderate pressure massage was implemented by parents to their children aged 6-11 who had a diagnosis of sensory modulation disorder (SMD) and reported sleep difficulties. Spira found the children in the treatment group had significant improvements in sleep related outcomes of sleep onset, sleep anxiety, parasomnia, sleep duration, daytime sleepiness, total sleep scores and social participation on all measures of the social sub-section of the CBC, except for withdrawal.

The findings of this study show that moderate pressure massage may be useful for improving sleep and social participation of children with sensory difficulties (Spira, 2015). This also shows that there may be a link between sleep and social participation in children with SMD. Limitations of this study included convenience sampling, subjective parent report and non-blinding of conditions.
Summary of Studies Implementing Parent Education

Although the majority of the articles included in this review included an aspect of parent education, only three articles discussed parent education as the primary focus of intervention (Malow, Adkins, Reynolds, Weiss, Loh, Fawkes, ... & Clemons, 2014; Malow, MacDonald, Fawkes, Alder, & Katz, 2016; Wooster, Gwin, Gwin, Hargis, Papania, Register, & Rood, 2015). Outcome measures included parent knowledge, subjective measures of quality of life (Wooster et al., 2015), and parent report of child sleep outcomes (Malow et al., 2014; Malow, MacDonald, Fawkes, Alder, & Katz, 2016). These studies also looked at the mode of delivery of parent education, including effectiveness of providing sleep information to individual parents or parents of children with ASD in a group setting (Malow et al., 2014) and mail delivered home sleep programs for children with ASD (Malow et al., 2016).

These studies showed that there is no difference in outcomes between individual and group education interventions (Malow et al., 2014), and that educators may not always be a necessary delivery model (Malow et al., 2016). Parent sleep education can significantly improve parent sleep knowledge. Improvements in parent reported child sleep outcomes suggest that parent education alone can have a positive impact on improving child sleep quality, however the level of impact these have had on the sleep of their children remains unclear.

Summary of Studies Implementing Healthy Media Use

One unique approach by Garrison and Christakis (2012), focused on the reduction of violent media use with preschool aged children. In comparison to the control group, the study results indicated that sleep behaviors improved among the intervention group but they did not report statistically significant improvements in the findings, and the improvements gained were not maintained at the 18 month follow-up (2012). The authors suggested results can still be considered useful as sleep disturbance preventative measures to supplement another intervention with more statistical power (Garrison & Christakis, 2012).
Implications for Consumers:

The consumers of this research are children ages birth to 13 with sleep problems, their parents, and their teachers. This information regarding interventions could inform best practice techniques for treating specific sleep problems among school aged children. Medication is often the first line of treatment for children with sleep problems despite the lack of research on its effects and the controversy regarding prescribing pharmaceuticals to children (Vriend et al., 2011). However, the findings reviewed suggest effective non-pharmaceutical options.

Despite the fact that there is less research available for children with specific diagnoses, the research indicates that sleep interventions can be effective for most children. Behavioral approaches in particular may be suitable for adapting to the specific needs of the family and feasibly implemented by parents with the consultation of professionals. Improved sleep due to sleep interventions can result in a variety of improvements in quality of life, behavior, and academic outcomes for the consumers. As many interventions showed improvements on a variety of outcome measures, sometimes even symptoms related to specific diagnoses, sleep interventions may receive insurance coverage.

Implications for Practitioners:

Research indicates that sleep interventions can improve sleep in both typically developing children and those with DDs, ASD, SMD, ADHD, ODD and visual impairments. What is consistent across findings for these children is that interventions are tailored to consider the needs of both the child and the family and that parents are involved in implementation.

Practitioners should begin by considering using screening tools to identify children who may benefit from sleep intervention. Sleep diaries have been widely used to track sleep and have been shown to correlate with actigraphy measures of performance. Many of the studies reviewed implemented behavioral approaches as intervention. Behavioral strategies are enhanced when data on child behavior is taken. This behavioral tracking lends itself to single-subject design research as a method for evaluating
the effectiveness of the intervention and improving outcomes.

For children presenting with sleep difficulties, school based or outpatient practitioners may implement a variety of interventions to address their needs. These interventions may include programs for parents with manuals and consultations to support the parent’s understanding of child sleep difficulties and ways to mitigate them. Practitioners at schools that utilize RTI practices could create unique approaches to working with teachers, children and parents on sleep hygiene education and interventions. A home health practitioner may have an advantage by being able to work directly with the family to adapt their environment to facilitate better sleep hygiene, while an inpatient therapist may create a parent education handbook and home program to hand out to families before discharge. No matter the setting, what seems to be most important is that parents are supported in the implementation of intervention. For every study included in the CAT, parent education and parent implementation of intervention were part of the treatment. Individual face-to-face consultations, group face-to-face consultations, and phone consultations between parents and practitioners were all found to be effective delivery models.

**Implications for Researchers:**

There is limited literature on sleep interventions for children. To gain sufficient evidence there needs to be an increase in replicated, experimental research with careful control of confounding variables. There is a need for more studies addressing sleep problems for both typically developing children, as well as those with specific diagnoses. In addition, many studies implement sleep routines alongside other interventions, but few studies analyzed sleep routines alone. Only three of the studies found were based in school settings. There is a clear need for more research on school based interventions. No studies were conducted by occupational therapists and there is almost no literature that looks at the impact of sleep intervention on directly measured functional outcomes. There is a need for researchers to report on the socioeconomic or racial demographic information of participants.
Many of the studies did not include this information or there was an overrepresentation of white families. It is also important to measure changes in outcome measures over a longer period of time, up to 2 years. Many of the studies used behavioral intervention with follow-ups limited to 6-months post-intervention, despite evidence that parent implementation and child responses to intervention may take extended time to result in changes in sleep.

**Bottom Line for Occupational Therapy Practice/ Recommendations for Better Practice:**

Sleeping problems may be present in both typically developing children and those with identified diagnoses who commonly receive special services. The breadth of interventions yielding positive results suggests that sleep problems emerge from a variety of factors. Interventions can target client factors such as sensory function, specific sleep related behaviors, and the social and temporal environments. No studies focused exclusively on the child; at the very least, interventions include parents as an integral component of improving a child’s sleep through education on sleep hygiene, or by having the parent carry out a sensory or behavioral treatment. The three studies that implemented intervention at the school-wide level also found significant improvements in sleep for the children studied. Based on these findings, occupational therapists are encouraged to consider using interventions that support the child’s environment, such as including parents, teachers and school administrators in the implementation of environmental modifications, behavioral, and sensory treatments. Having administrators consider changing the start time of school, helping teachers implement sleep hygiene education and supporting parent investment in learning behavioral interventions and sleep routines, are all interventions worthy of consideration for practice.
References


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*and Consultation Therapy, 1, 165-190.


Involvement Plan

Research is fundamental to ensuring best practice and improved health outcomes for communities that occupational therapists serve. However, knowledge generated from research must be communicated to practitioners and implemented into strategies, techniques and interventions in order to have an impact on communities. For our process of knowledge translation, we chose the Reach, Efficacy/Effectiveness, Adaptation, Implementation, Maintenance, (RE-AIM) model to guide and frame our work (Palinkas & Soydan, 2012). The RE-AIM model (Palinkas & Soydan, 2012) focuses the process of knowledge of translation through five questions:

1) “How do I reach those who need intervention?”
2) “How do I know my intervention is effective?”
3) “How do I develop organizational support to develop my intervention?”
4) “How do I ensure this intervention is delivered properly?”
5) “How do I incorporate this intervention so it is delivered over the long-term?” (p. 67).

To begin the implementation of our knowledge translation process we emailed Dr. Julie Anderson a list of potential ideas for translating the research we compiled. Our first idea was to contact the researchers who used manuals as their primary delivery method and who also found improvements in sleep outcomes. We would, with permission, then utilize these manuals, either as is or with modification, for Dr. Anderson to implement in her sleep intervention program. Another idea we had was to create an informational pamphlet for parents that would give an overview of sleep problems, child sleep needs, and potentially useful interventions.

Dr. Anderson thought sourcing manual information could provide her with helpful material; however, she was not yet ready to create extensive educational materials for families in her program and informed us that she had already begun a pamphlet for parent education. In
addition, Dr. Anderson informed us that she had only recently submitted her plan to implement a sleep intervention program with her preschool students to the Puyallup School District’s institutional review board. She had also spoken with preschool teachers about her plan and was providing an in-service for daycare workers.

After analyzing the list and considering how the translation of our work could best serve her and her clients, Dr. Anderson decided that she wanted us to create a pamphlet for pediatric primary care physicians. This focus moved the project away from the public-school program and towards her work as a private pediatric therapist. The pamphlet provides an overview of sleep problems in children as well as best practices describing the prevalence, symptoms, ways to screen and assess the problems, referral information to her private clinic, and potential intervention strategies. In addition, she wanted us to create presentation materials that she could utilize while disseminating information to physicians. After interacting with many local pediatricians, Dr. Anderson feels that physicians often do not understand or screen for sleep problems in children and that this information could help them in identifying these problems and either treating or referring them to get services.

Pediatric and family primary care physicians may work in private practices, nonprofits, or government organizations. Each organizational structure will possess different characteristics that could enhance or inhibit the translation of our findings into improved outcomes for child sleep. Some physicians, especially in private practice, may have more autonomy in deciding whether to accept the educational materials, as well as making decisions related to pursuing the topic with their client, whereas those in public institutions may not.

Dr. Anderson explained that inviting local pediatricians to a presentation, such as this one, is a rare occurrence, but she believes that there is an interest among local physicians
regarding the topic of pediatric sleep. Dr. Anderson has personal connections with pediatricians and family care physicians in her community due to personal and professional networking. She is in a good position to promote the spread of information gathered in this research due to the breadth of her role in the community, her awareness of sleep as a valuable occupation, and her enthusiasm for addressing this emerging practice. Her connections and the local interest could be the largest facilitators to translating our research of pediatric sleep interventions into practice.

Barriers still remain, such as physician’s limited time and limited knowledge on the billing processes and implications and prevalence of pediatric sleep problems. There are also many physicians in the surrounding area that are still unaware of this common problem among children and may not consider addressing sleep deficits as important. Without further education, many physicians may not think they have adequate knowledge and training in order to address sleep problems in children beyond prescribing medication or knowing who to refer children to for treatment. Another potential barrier to her success in implementing our findings, is her limited experience addressing sleep in children, as well as the lack of detailed protocols that would provide support for implementation of specific behavioral plans.

**Tasks and Scheduled Dates**
The following table describes the tasks that were completed for Dr. Anderson and the time frame in which we completed them:

<table>
<thead>
<tr>
<th>Product</th>
<th>Deadline Date</th>
<th>Steps and dates of final outcomes</th>
</tr>
</thead>
</table>
| Pamphlet on pediatric sleep designed for pediatricians | 3/27/17       | • 3/3/17 - Prevalence numbers and additional research for new client focus completed (pediatricians vs. school)  
• 3/10/17 - Format for pamphlet finalized with section headings  
• 3/17/17 - Rough draft completed with basic sections filled out |
| PowerPoint on pediatric sleep designed for Julie to present to | 4/7/17        | • 3/24/17 - Format with slide titles completed  
• 3/31/17 - Rough draft of Power |
Outcomes of activities to be monitored/evaluated
Following distribution of pamphlets, we will survey physicians to monitor the following outcomes:

1. Perceived improvements in knowledge of non-pharmaceutical pediatric sleep interventions.
2. Estimate of frequency of consultation with clients regarding child sleep in past 6 months.
3. Perceived utility of pamphlet on client care.
4. Frequency of use of provided knowledge with clients following receiving pamphlet.

Knowledge Translation Activities
To begin the process of knowledge translation, a number of different options regarding ways to use the information for implementing sleep screenings and treatments were compiled to assist Dr. Anderson. Several different options for knowledge translation projects were prepared, including 1) contacting researchers to ask if they would be willing to share their materials, 2) compiling protocols into materials specifically for clients, 3) putting together a presentation for parents and/or the district, 4) completing any materials Dr. Anderson had already begun working on, 5) investigating and implementing strategies to make educational materials accessible to parents by taking into account a variety of educational and cultural backgrounds, and 6) compiling a list of the techniques found, defining them, outlining how to implement them, and describing what population would benefit most from the intervention. In order to assess the utility of these various plans, Dr. Anderson was informed of these ideas and her input was gathered. When meeting with her, she stated that she was not at a stage to begin implementing interventions and had yet to conduct sleep screenings.
Dr. Anderson informed us that her efforts to improve sleep among local children would most benefit from resources to educate and inform other health professionals and families on sleep health and intervention. This change in audience provided an unforeseen turn in direction for the knowledge translation of the research. Based on her request, a pamphlet was created to inform pediatricians of sleep problems in children and ways to treat them. To begin the process, an outline was created based on information from the findings that would be most relevant to doctors. The categories outlined in the pamphlet included prevalence of sleep disorders in children, consequences of common sleep problems, ways to screen and treat, and how occupational therapy can address sleep concerns. Information was pulled from the original CAT table and paper to inform the topics covered in the pamphlet. Additionally, further resources were sought and utilized to supplement the original data in order to tailor the information in the pamphlet to meet the needs of the new audience. Once the pamphlet was completed, the same outline was used to inform the creation of a presentation that could be delivered to doctors in a presentation led by Dr. Anderson. The presentation can be customized and further developed as Dr. Anderson develops and alters her sleep intervention program and as her expertise in this area grows. After completing the process of creating the pamphlet and presentation, it was sent to the mentor and chair for review. Upon receiving feedback, revisions were made to the presentation and pamphlet and they were then sent to Dr. Anderson for her input and recommendations. A survey was also created and given to Dr. Anderson for her to use when she presents the material in order for her to track outcomes. After she had a chance to review these items, she gave us requests and suggestions for edits and additions to the pamphlet, presentation and survey. These documents have been updated based on Dr. Anderson’s suggested edits and are attached to this paper in Appendix A and B.
Implementation Schedule
The following table describes dates that completed drafts and final products were delivered to supervising chair (Renee Watling, PhD, OTR/L, FAOTA) and community clinician (Julie Anderson, DrOT, OTR/L).

<table>
<thead>
<tr>
<th>Item</th>
<th>Rough Draft to Chair</th>
<th>Rough Draft to Clinician</th>
<th>Final Draft to Chair</th>
<th>Final Draft to Clinician</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pamphlet</td>
<td>3/28/17</td>
<td>4/10/17</td>
<td>4/26/17</td>
<td>5/7/17</td>
</tr>
<tr>
<td>PowerPoint Slides</td>
<td>4/5/17</td>
<td>4/10/17</td>
<td>4/26/17</td>
<td>5/7/17</td>
</tr>
<tr>
<td>Post-Presentation Survey</td>
<td>4/9/17</td>
<td>4/10/17</td>
<td>4/26/17</td>
<td>5/17/17</td>
</tr>
</tbody>
</table>

Outcome Monitoring and Effectiveness

The current student researchers will be unable to monitor the translation of this knowledge into the community due to conflicts in researcher and clinician timelines. Therefore, the effectiveness of the products cannot be directly measured at this time. Outlined below is a tentative plan for Dr. Anderson to conduct her own measurements of effectiveness and further ideas for evaluation once this research is incorporated into practice.

The effectiveness of the two translational products could be monitored in a variety of ways. The pamphlet was created to inform community physicians of sleep problems in children and ways to screen for and treat these problems. It was also meant to provide physicians with resources to connect with Dr. Anderson or do their own research if they became interested in the topic. The PowerPoint presentation was created to give interested physicians more information in order to impact their practice and interaction with clients. In order to monitor a change in physician awareness of child sleep problems, sleep assessments, and sleep interventions, a survey was constructed to be administered to physicians after the in-services that Dr. Anderson intends to give. She was provided with a survey (see Appendix C) to hand out at her presentation to receive immediate feedback anonymously at the end of the session via a covered box located
at the exits of the room. Questions included on the survey are meant to focus on physician interest and intent to incorporate the new information into practice.

If there was more time allotted for this project the student researchers had planned to mail out a follow-up survey approximately three months after Dr. Anderson provided her in-service to the local physicians to measure how effective her presentation was over time and to collect data on how many physicians were using the information and in which ways. This would take the form of either a mailed survey with a pre-posted return envelope or an emailed survey for ease of completion; both forms would provide anonymity. Another potential way to monitor the effects of the products would be to gather data on outcome measures in the children that Dr. Anderson intends to treat for sleep problems either within her school district or her private practice. A survey or sleep questionnaire would be given to gather baseline data on child sleep quality and behavior on those children selected. These measurements would be taken again post intervention to provide a comparison and help identify outcomes.

**Process Reflection**

We were fortunate to have team members who worked well together. We each have complementary strengths which allowed us to delegate tasks efficiently. Having three team members helped to balance out the workload and promoted effective communication between all group members. One group member is a relationship builder who efficiently communicated with team members and supervisors, organized deadlines and kept us on track. A second team member was a strategist who developed ideas and inspiration. A third member is an executor who made sure work was generated and completed.

We faced one challenge during the process of creating knowledge translation products. The clinician had not had the time she hoped for to start screening children in the school system.
Thus, she was open to alternative ways, outside of her school-based practice, in which we could translate our findings that would still be beneficial for occupational therapy practice in general, and support her goals. Due to this change in direction there was a period of lag time between knowledge generation and implementation of product development. Our efficiency at meeting deadlines was not what we had hoped but we enjoyed taking our research in a different direction to further our learning of the topic. In addition, the clinician’s schedule was not aligned with the course timeline for optimal product completion. However, our clinician was enthusiastic about our work and clearly saw the utility of our findings.

Producing the educational material for physicians regarding sleep health in children provided an interesting change in direction for us because our original research had been focused on non-medical treatments with schools and occupational therapists in mind. Treatment ended up being one portion of what was included in the pamphlet in addition to further supplemental research.

**Feasible Future Projects**

The information that has been gathered is most relevant for the creation of intervention guidelines and protocols. The work could be translated into a manual describing step-by-step protocols for parents or clinicians. Further efforts could be made to contact lead researchers in order to inquire about accessing educational materials used in studies to inform the manual. Based on permission from the researchers and information gathered, a more succinct manual would be created using multiple sources to provide a tool for parents and clinicians to assist their sleep intervention processes.

The knowledge could also be used to inform pamphlets and other educational materials
CHILD SLEEP INTERVENTIONS

and resources for parents and teachers. The pamphlets would be used to introduce teachers and parents to prevalence, implications and resources regarding sleep problems and ways they can manage and reduce the effects of caffeine, lighting, sugary foods, and parenting styles on sleep problems.

If Dr. Anderson proceeds with gathering baseline data and implementing sleep interventions within her school district, future student researchers could help collect outcome measures following sleep interventions. This information could be analyzed for statistical significance. It could also be analyzed for outcome measures that go beyond sleep quality to measure other areas of occupational performance, such as educational participation and social engagement.

Some of the studies found in the investigation of interventions looked at the impact of changes to school wide policies on sleep and corresponding academic performance outcomes. Future knowledge translation could focus on providing information to school administrators to promote consideration of policies that promote or inhibit sleep in their students and ways this affects school performance. This information could be provided in the form of educational materials or in-service presentations.
References


Appendix A
Pamphlet for Physicians

How occupational therapy can help:

According to the American Occupational Therapy Association, sleep is an important occupation that falls under the profession’s practice domain. More specifically, the occupational therapy practice framework outlines that practitioners are well suited to help clients manage sleep preparation and sleep participation itself based on their client-centered practice and course of study. Sleep is a vital occupation throughout the lifespan. From infancy into old age, we spend around 1/3 of our time sleeping. Occupational therapists specialize in helping individuals improve their performance in sleep and other areas of life in order to maximize quality of life. Occupational therapists are well suited to address sleep hygiene and behaviors and order to improve sleep performance and the many other areas of function that sleep can impact.

1. Poor sleep can impact performance and function, which are both vital areas OT addresses in treatment

2. OT’s are trained in using behavioral approaches in treatment. Due to the closeness with which we work with families, we are well poised to implement sleep specific behavioral interventions and help families understand how to use behavioral tools and monitor outcomes.

3. OT’s can work with clients in the home, which is the most successful place to address sleep problems and building a family routine

4. OT’s are skilled in addressing habits and routines as well as adapting to meet the needs of clients, which are important aspects related to working with clients suffering from sleep problems.

5. OT’s can modify the sleeping environment based on the individual’s need

References
**Prevalence of Sleep Problems:**

Sleep problems is a term that covers any behavior that impacts a child's sleep or parent's perception of sleep. Types of sleep problems or disruptive sleep behaviors include: delayed sleep onset, frequent night wakeings, and night terrors. The prevalence of sleep problems in American children may be surprising, as approximately 25% of typically developing children are found to have sleep problems, and up to 80% of children with diagnoses such as ADHD, ASD, and ADHD experience sleep problems. Many children may be impacted by poor sleep behaviors and the risk increases with developmental or behavioral diagnoses. Sleep problems are common throughout early childhood and early elementary years, impacting many aspects of the child's life as well as the family of the child experiencing sleep problems.

**The Consequences of Poor Sleep**

Early identification and treatment of sleep problems is important because problems can lead to negative outcomes. Lack of sleep in children can contribute to problems with:

- Cognitive, emotional, and behavioral regulation
- Poor school performance and changes in grades
- Obesity
- ADHD and many psychiatric disorders

**Ways to Screen**

Different tools have been developed to assess sleep in children, each with benefits and drawbacks, including direct observation, actigraphy, video polysomnography, polysomnography (PSG) and subjective reports. PSG is considered the gold standard for sleep evaluation; however, PSG requires monitoring in a laboratory setting and is usually unnecessary for the identification of sleep troubles. PSG is necessary to diagnose specific sleep disorders. Subjective measures can provide sufficient information for identification of children who could benefit from intervention. Parent and team provided sleep logs can provide descriptive information about the nature of sleep and daytime functioning.

There are a number of different psychometrically validated questionnaires available for assessing child sleep that can be easily administered by a physician or other health professional. Two popular tools include:
1. The Sleep Disturbance Scale for Children (SDSC)
2. The Children's Sleep Habits Questionnaire (CSHQ)

**Ways to Treat**

Medication is typically the first approach to addressing sleep problems in children. However, research into effectiveness, side effects, and long term consequences of prescribed medication or over the counter melatonin use in children is inconclusive. Furthermore, non-medication interventions have been shown to be an optimal treatment and minimize risk of potential detrimental side effects. Sleep interventions have led to improvements in a variety of outcomes including sleep onset time, total sleep time and number of night wakeings. Occupational therapists are well qualified to implement all the intervention approaches discussed in this section.

**A. Evidence based approaches: Behavioral interventions**

- Almost all behavioral approaches researched resulted in positive outcomes for the children and families regardless of the specific behavioral strategies used. Behavioral interventions showing improvements in sleep outcomes include:
  1. Extinction: avoid reinforcement of waking behaviors by withholding from entering a crying child's room to offer comfort during designated sleeping times.
  2. Faded bedtime: over time gradually move bedtime earlier or later depending on desired bedtime.

- Response cost: desired stimulus is taken away when negative sleep behaviors occur to reduce their occurrence.
  a. Example: If child leaves room after being put to bed, restrict access to electronics or dessert.

- Fixed Interval attention: Offer comfort to distressed child during sleeping times at consistent intervals.

- Stimulus fading: slowly removing yourself from child's room during sleeping times.

- Positive reinforcement: offering a reward for positive sleep behaviors.

**B. Approaches showing moderate effect: Sleep hygiene and sensory approaches**

- Sleep hygiene interventions alone have shown to be insufficient to treat sleep disorders in children with developmental disorders and autism spectrum disorders, but can be beneficial when utilized in conjunction with behavioral approaches. Examples of sleep hygiene approaches include:
  1. Routines: establish predictable, consistent pre-bedtime activities that occur at the same time every day such as taking a bath, brushing teeth, reading a book.
  2. Stimulus removal: avoid caffeine, sugar, high energy activities, stimulating medications and screen time before bed.
  3. Relaxation: begin calming down by participating in relaxing activities before bed such as reading a book, doing a puzzle, coloring.

- Studies regarding the efficacy of sensory approaches on treating sleep disorders are limited, however positive outcomes with isolated studies warrants further research in the area. Examples of effective sensory approaches include:
  1. Pressure massage: children sensory modulation disorder given nightly pressure massage by parents.
Prevalence of Sleep Problems

Sleep problems are common.

The prevalence of sleep problems in typically developing children is approximately 20%.1

This number increases to 80% in children with behavioral, developmental, or psychological diagnoses such as ADHD, ASD, PDD, or DD.2

These children and their families are appropriate candidates for non-pharmacological interventions to improve sleep.

General Sleep Guidelines

Infants four to 12 months should sleep 12 to 16 hours per 24 hours (including naps) on a regular basis to promote optimal health.

Children one to two years of age should sleep 11 to 14 hours per 24 hours (including naps) on a regular basis to promote optimal health.

Children three to five years of age should sleep 10 to 13 hours per 24 hours (including naps) on a regular basis to promote optimal health.

Children six to 12 years of age should sleep nine to 12 hours per 24 hours on a regular basis to promote optimal health.

Teenagers 13 to 18 years of age should sleep eight to 10 hours per 24 hours on a regular basis to promote optimal health.

What are sleep problems in childhood?

- Insomnia: persistent difficulty falling asleep, staying asleep, or waking too early
- Sleepwalking: waking up during the night, often in a confused state
- Night terrors: waking up in a panic

- Sleep apnea: a sleep disorder characterized by pauses in breathing during sleep

- Delayed-onset sleep phase disorder: a condition where a person's circadian rhythm is shifted later than normal

- Shift work disorder: a condition where a person's circadian rhythm is shifted due to the need to work shifts
CHILD SLEEP INTERVENTIONS

Consequences of Sleep Problems in Children
Early identification of sleep problems is important because they can lead to negative long-term outcomes and consequences. Lack of sleep in children can contribute to problems of:
- Cognitive, emotional, and behavioral issues
- Poor school performance and changes in grades
- Obesity
- ADHD and other psychiatric disorders

Ways to Screen for Pediatric Sleep Problems
Although adipometry, polysomnography, and actigraphy are non-invasive, screening tools are found to be highly accurate and reporting questionnaire and objective sleep measures, they may not always be necessary for identifying sleep problems.
The following tools can be used easily and quickly to screen for pediatric sleep problems:
- Palmieri's UCSD Sleep Questionnaire

Subjective reports:
- Parent or teen provided sleep logs can provide useful descriptive information about the nature of sleep and sleep dysfunction

Treatment of Pediatric Sleep Problems
Medication is typically the first approach to addressing sleep problems in children. However, research reveals that interventions, such as behavior therapy, and sleep habits contribute to the treatment of sleep problems. Non-medicated treatments have been shown to be an effective intervention and reduce the risk of potential health risks associated with sleep disorders.

Treatment of Pediatric Sleep Problems
The following slides will define several intervention strategies that the research has found to be effective. It is important to remember that every family and every child is different. The most successful studies chose tailored treatments based on the unique circumstances of each family and client.

Treatment of Pediatric Sleep Problems
Evidence Based Behavioral Interventions:
Almost all behavioral approaches included in the literature review resulted in positive outcomes for the children and families. Regardless of the specific behavioral strategies used, behavioral interventions showing improvements in sleep outcomes include:
- Distraction
- Parent bedtime
- Response cost
- Fixed interval attention
- Sleep limiting
- Positive reinforcement

Evidence Based Behavioral Interventions
Extinction: avoid reinforcing negative bedtime behaviors (e.g., crying), or night feedings once the child has fallen asleep by withholding entering a child's room to offer comfort.
Evidence Based Behavioral Interventions

Fixed bedtime: over time gradually move bedtime earlier or later depending on desired bedtime.

Evidence Based Behavioral Interventions

Response cost: desired stimulus is taken away when negative sleep behaviors occur to reduce their occurrence.

Evidence Based Behavioral Interventions

Fixed internal attention: Offer comfort to distressed child during sleep times at consistent intervals.

Evidence Based Behavioral Interventions

Stimulus fading: slowly removing yourself from child’s room during sleeping times.

Evidence Based Behavioral Interventions

Positive Reinforcement: offering a reward for positive sleep behaviors.

Ways to Treat Common Pediatric Sleep Problems

Sleep Hygiene Interventions:

Sleep hygiene interventions alone have shown to be insufficient to treat sleep disorders in children with attention-deficit disorders and autism spectrum disorders, but can be beneficial when allied in conjunction with behavioral approaches. Examples of sleep hygiene include:

- Bedtime
- Stimulus removal
- Relaxation
CHILD SLEEP INTERVENTIONS

Sleep Hygiene

Routines: establish consistent pre-bedtime activities such as taking a bath, brushing teeth, reading a book.

Sleep Hygiene

Stimulus removal: avoid caffeine, sugar, high energy activities, stimulating medications, and screen time before bed.

Ways to Treat Common Pediatric Sleep Problems

Studies regarding the efficacy of sensory approaches on treating sleep disorders are limited; however, positive outcomes with isolated studies warrant further research in the area. Examples of effective sensory approaches include:

Pressure massage before bed.

Occupational Therapy and Sleep

According to the American Occupational Therapy Association, sleep is an important occupation that falls under the profession's practice domain.

Occupational therapists are well suited to help clients manage sleep through the use of multiple approaches to improve performance, including through addressing sleep hygiene and problem behaviors.

Occupational Therapy and Sleep

The research included in this review resulted in positive outcomes when interventions when were tailored to each individual's unique needs. Other caregivers can assess behavioral approaches, focusing on finding the right path may not consider the client and family as a whole. Occupational therapy utilizes a client centered view when treating individuals, pacing them in the optimal position to treat sleep problems.
Appendix C

Pediatric Sleep Problems & Treatment PPT Feedback

Please fill this out and place in the basket by the door on the way out.

1. On a scale from 1 to 5, how adequately prepared did you feel addressing sleep concerns with your clients prior to this presentation?
   a. not at all prepared
   b. a little prepared
   c. somewhat prepared
   d. prepared
   e. extremely prepared

2. Within the last 6 months, how often have you discussed sleep with families of pediatric patients? For example, have you discussed sleep at every visit, at well child check-ups, only when parents voice concerns, or other?

3. What is one thing that you learned today that was new? What is one thing that you learned today that you can apply to your practice?

4. In what ways will you use this information to address sleep with your patients? Circle all that apply:
   a) I will ask parents about concerns with their child’s sleep
   b) I will regularly perform sleep screenings
   c) I will defer pharmacological interventions until first referring families to psychologists or occupational therapists to address sleep problems

5. On a scale of 1 to 5, how likely is it that you will bring up the topic of sleep in with your clients following your participation in today’s presentation?
   1: no chance  2: unlikely  3: unsure  4: likely  5: certainly

6. Is there information that was not addressed in this presentation that you have questions about regarding pediatric sleep problems? If so, what information are you still interested in learning about?
Acknowledgements

This project would not have been possible without the step-by-step guidance and sound advice of Renee Watling PhD, OTR/L, FAOTA, the inspiration and real-world experience provided by Julie Anderson DOT, OTR/L, and the infinite wisdom of George Tomlin PhD, OTR/L, FAOTA.
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Name: ________________________________________________  Date: ______________________

Signature of MSOT Student

Name: ________________________________________________  Date: ______________________

Signature of MSOT Student

Name: ________________________________________________  Date: ______________________

Signature of MSOT Student