

A SLEEP INTERVENTION FOR CHILDREN WITH AUTISM: A PILOT STUDY

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STATUS: *The complete study is being submitted for publication, which precludes release of the full data at this point in time. The following is a summary.*

OBJECTIVE: The aim of this study was to examine the immediate, short-term effects of Integrated Listening Systems' (iLs) Dreampad™ on the sleep behaviors of children with Autism Spectrum Disorder (ASD). In addition, this study examined the effects of changes in sleep patterns on parent and family measures of stress and quality of life.

RATIONALE/BACKGROUND: Sleep problems have been reported in children/individuals with ASD for many years (Sung, Hiscock, Sciberras, & Efron, 2008; Vriend, Corkum, Moon, & Smith, 2011). Prevalence estimates of sleep problems for children with ASD range from 44- 83% (Konofal, Lecendreux, & Cortese, 2010; Reed et al., 2009; Weiss & Salpekar, 2010). Common problems include, difficulties initiating sleep, maintaining sleep, short night sleep duration, early morning waking, tiredness upon waking and daytime sleepiness.

It is likely that sleep problems in children with ASD exacerbate their daytime behavior problems. Reports indicate more stereotypical behaviors, social difficulties and emotional problems in ASD show greater impairments in social and academic functioning (Bendz & Scates, 2010; Reynolds & Malow, 2011). Additionally, their parents are at greater risk of sleep deprivation resulting in an increased rate of clinical depression or anxiety compared to caregivers of children without sleep problems (Sung, et al., 2008).

Given the association between sleep problems, reduced behavioral performance and parental stress, there is a need for effective sleep intervention programs for these populations. Behavioral methods and medications have some reported success but these approaches are time consuming and can produce negative side effects (Reed, et al., 2009; Weiss & Salpekar, 2010). Multiple case studies from parents using the Dreampad report changes in sleep behavior within days of initiating use; however, there is no published literature systematically examining this as a treatment for children with ASD.

METHOD: An ABA design was employed in this study. It is an experimental design in which participants are first introduced to a baseline condition (A). In the baseline condition, no treatment is initiated. Next participants receive the treatment (B), after which they return to the baseline condition (A). This study employs a 1-2-week baseline period, which precedes the intervention (A). Following the treatment condition, using the Dreampad is introduced daily for a period of 1-4 weeks (B). Effects are measured immediately following the intervention. The Dreampad intervention is then discontinued for the next 1-2 weeks (A) allowing for observation of a possible carry-over effect from the intervention.

PARTICIPANTS: A total of 15 children with ASD and their families participated in this study. They completed questionnaires at the start of the study, after use of the Dreampad and again after the Dreampad was returned to the clinic. Criteria include: age 3-18 years, diagnosis of ASD provided by a

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qualified clinician (e.g. pediatrician, neurologist, psychologist), sleep disorder confirmed by parent report and completion of sleep screening questionnaire.

SETTING: The Dreampad was used in the child's home every night for a total of 3 weeks. The program was monitored by an occupational therapist.

DESIGN: An ABA multiple baseline repeated measures single subject design was employed with a 3-4 week no-treatment baseline, 3 weeks of nightly use of the Dreampad and a 2 week return to baseline period. Visual depiction was used to display and analyze the data.

MEASURES: The repeated measure used during baseline, intervention and return to baseline was the pediatric sleep diary. The pre/post outcome measures were the Pediatric Quality of Life Inventory (PedsQL) and the Child's Sleep Habits Questionnaire (CSHQ).

INTERVENTION: The Dreampad program delivers ambient sounds and music via transducers imbedded in the pillow. Families participating in the study were instructed in its use by a trained therapist. Each participant used the Dreampad for 2 hours at night when going to bed (the device can be programmed to turn off automatically), on consecutive nights for 3-4 weeks.

RESULTS/LIMITATIONS/CONCLUSIONS: Improvements were noted in sleep initiation, duration of sleep, reduction in night waking and improved daytime behavior. All 15 children showed a decrease in sleep problems as noted in response to the sleep diary or the CSHQ. Similarly all 15 families had improved scores on the PedsQL, some of which persisted beyond the time they were actively using the Dreampad. Changes were most notable in emotional, social and school functioning.

All of the parents reported a positive reaction to using the Dreampad and were interested in continuing its use. Many said their children were going to bed/sleep more quickly, sleeping more soundly, waking up more easily and generally seemed more relaxed.

PROPOSAL IS IMPORTANT TO PRACTICE AND SCIENCE: This study suggests that the Dreampad may be an effective intervention for children with ASD who have sleep problems, either in conjunction with a comprehensive OT program or on its own. Given the association between sleep problems, reduced behavioral performance and parental stress, this may be an effective sleep intervention program for ASD populations.

REFERENCES:

- Bendz, L. M., & Scates, A. C. (2010). Melatonin treatment for insomnia in pediatric patients with attention- deficit/hyperactivity disorder. *Annals of Pharmacotherapy, 44*(1), 185-191.
- Konofal, E., Lecendreux, M., & Cortese, S. (2010). Sleep and ADHD. *Sleep Medicine, 11*(7), 652-658. doi: 10.1016/j.sleep.2010.02.012
- Reed, H. E., McGrew, S. G., Artibee, K., Surdkya, K., Goldman, S. E., Frank, K., . . . Malow, B. A. (2009). Parent-based sleep education workshops in autism. *Journal of Child Neurology, 24*(8), 936-945. doi: 10.1177/0883073808331348

Research

- Reynolds, A. M., & Malow, B. A. (2011). Sleep and autism spectrum disorders. *Pediatric Clinics of North America*, 58(3), 685--698.
- Sung, V., Hiscock, H., Sciberras, E., & Efron, D. (2008). Sleep problems in children with attention-deficit/hyperactivity disorder: Prevalence and the effect on the child and family. *Archives of Pediatrics & Adolescent Medicine*, 162(4), 336-342. doi: 10.1001/archpedi.162.4.336
- Vriend, J. L., Corkum, P. V., Moon, E. C., & Smith, I. M. (2011). Behavioral Interventions for Sleep Problems in Children With Autism Spectrum Disorders: Current Findings and Future Directions. *Journal of Pediatric Psychology*, 36(9), 1017-1029. doi: 10.1093/jpepsy/jsr044
- Weiss, M. D., & Salpekar, J. (2010). Sleep problems in the child with attention-deficit hyperactivity disorder: Defining aetiology and appropriate treatments. *CNS Drugs*, 24(10), 811-828. doi: 10.2165/11538990-000000000-00000