

# Sound Pillow Sleep System Research Study

## Summary of the Research Project

Individuals with Autism Spectrum Disorder (ASD) have persistent deficits in social communication and social interactions based on *Diagnostic and Statistics Manual of Mental Disorders, Version 5 (DSM-V)* criteria (American Psychiatric Association, 2013). These deficits can be seen in social-emotional reciprocity, understanding and maintaining relationships, and nonverbal communication. Additionally, individuals with ASD have restricted and repetitive patterns of behaviors, interests, and activities. A common issue individuals with ASD experience is disturbances in sleep. Sounders and colleagues (2009) found that 66% of children diagnosed with ASD reported moderate sleep problems while 45% of typically developing children reported mild sleep problems. The most commonly reported sleep problems of those diagnosed with ASD were behavioral insomnia sleep-onset. Parents of children diagnosed with ASD reported sleep problems such as going to bed, staying asleep, daytime sleepiness, and early morning waking (Wiggs & Stores, 2004).

The current study utilized an ABAB design to determine if the sleep pillow decreases the sleep problems associated with ASD. Along with the ABAB design, the study utilized five questionnaires to gain information from the participants or their guardians. Prior to collecting baseline data on the participant's sleep behaviors three questionnaires were given. The first questionnaire was the demographic measure to gain descriptive information from the participant. The next questionnaire was the Autism Spectrum Rating Scale (ASRS), which identifies behaviors and symptoms associated with ASD. The third questionnaire given was the Child Sleep Habit Questionnaire (CSHQ), which assess the sleep habits of a child (Owens, Spirito, & McGuinn, 2000). While collecting data on the daily sleep experiences of the participant, the fourth questionnaire was utilized. The Autism Spectrum Daily Sleep Questionnaire assessed the current daily sleep behaviors of the participant. At the end of the study, participants completed the Sound Pillow Sleep System and Track List Questionnaire that allows for the participants to provide information on the pillow and its functions.

## Purpose

The purpose of this research study was to determine if using the Sound Pillow Sleep System would help improve sleep problems in individuals diagnosed with ASD. The Sound Pillow Sleep System consists of a standard pillow that is connected to an MP3 Player, which allows individuals to play select sounds or music as they are falling, or are, asleep. To be included in the study participants met the following inclusion criteria:

- Documentation by a third party professional as having ASD;
- Confirmation of current or past sleep disturbances; and
- Were between 6-27 years of age.

Initial IRB approval was granted on 5/13/2016, revision approved on 5/26/2016, continuing review approved on 9/06/2016, and amendment approvals were granted on 9/07/2017 and on 1/09/2018. Data collection occurred 3/19/18 through 7/3/18.

## Procedures

The study utilized an ABAB design, with each portion of the study lasting for a period of two weeks for a total of eight weeks. Baseline data collection took place over a period of two weeks. After this period, participants used the Sound Pillow Sleep System for a period of two weeks. During the next two weeks, participants completed a second baseline data collection period. After the second two-week baseline data collection period, participants used the Sound Pillow Sleep System for a period of two weeks. Each participant's parent completed the Autism Spectrum Daily Sleep Questionnaire for each night of the research study. After completion of the study, participants were allowed to keep the Sound Pillow Sleep System.

## Results

There were 50 participants who successfully completed the entire study. Paired sample *t*-test analysis indicated that the difference in the amount of sleep with the Sound Pillow System during Week 8 ( $M = 10.29$ ,  $SD = 1.21$ ) compared to the amount of sleep without the Sound Pillow System during Week 1 ( $M = 10.07$ ,  $SD = 1.03$ ) was not statistically significant,  $t(49) = -1.64$ ,  $p = .108$ . Descriptive Statistics are listed below.

Parents did report, however, that they were pleased with the results of the Sound Pillow Sleep System and that they valued it. See comments below:

-Not only did the pillow facilitate better, longer sleep and a happier, productive mood, but using the pillow gave my son a feeling of new sense of empowerment about sleeping- he did not dread or avoid it. As a younger child he suffered from night terrors, sleep-walking, fear of the dark, and general dread about sleeping, especially alone.

-I was unsure that the sleep pillow would help my son. The first week with the pillow I noticed slight changes. During that time he also found tracks that worked well for him. By the second time during the trial using the pillow, he already knew what tracks he liked the best to help him sleep and there was a noticeable difference in his sleep patterns and behaviors. Negative behaviors started to decline because he was getting a better night's rest.

-I am glad I participated in this study. I will keep using the pillow for my son. I will be happy to talk about it with my friends who have kids in the autism spectrum and have sleeping problems. Thank you.

-We have tried everything to get our daughter to sleep in her room, we have tried oils and lights and remodeling her bedroom. This pillow has given her a real chance at a normal sleep pattern. Thank you

-This pillow has helped so much.

-Thank you for giving us the opportunity to try this out. Zach enjoyed going to bed more and I really do believe he benefited in some way. He seems more relaxed and less explosive since using the pillow.

-It's a great pillow and changed my daughter's whole outlook on sleep and staying bed. The best part of the pillow was that it kept her in bed. Which made her fall asleep faster

### Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Week1sleep	52	8.21	12.75	10.0646	1.01687
Week8sleep	51	7.79	14.36	10.2966	1.19639
Valid N (listwise)	50				

```
T-TEST PAIRS=Week1sleep WITH Week8sleep (PAIRED)
/CRITERIA=CI(.9500)
/MISSING=ANALYSIS.
```

### T-Test

### Notes

Output Created		27-SEP-2018 13:49:42
Comments		
Input	Data	C:\Users\frd92222\Documents\Research\Sleep Pillow Study\Amount of Sleep Data.sav
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	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	53
Missing Value Handling	Definition of Missing	User defined missing values are treated as missing.
	Cases Used	Statistics for each analysis are based on the cases with no missing or out-of-range data for any variable in the analysis.
Syntax		T-TEST PAIRS=Week1sleep WITH Week8sleep (PAIRED)

SPSS Statistics for Windows, Version 20.0.0.0 / CRITERIA=CI(.9500)  
 /MISSING=ANALYSIS.

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### Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Week1sleep	10.0671	50	1.03239	.14600
	Week8sleep	10.2940	50	1.20839	.17089

### Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	Week1sleep & Week8sleep	50	.627	.000

### Paired Samples Test

#### Paired Differences

		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		t	df	Sig. (2-tailed)
					Lower	Upper			
Pair 1	Week1sleep - Week8sleep	-.22686	.98006	.13860	-.50539	.05167	-1.637	49	.108