EFFECTS OF SLEEP HABITS ON CHILDREN DISPLAYING BEHAVIORAL PROBLEMS IN SCHOOL

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EFFECTS OF SLEEP HABITS ON CHILDREN DISPLAYING BEHAVIORAL PROBLEMS IN SCHOOL

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ABSTRACT

EFFECTS OF SLEEP HABITS ON CHILDREN DISPLAYING BEHAVIORAL PROBLEMS IN SCHOOL

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Often sleep is overlooked when school professionals are considering causes of problem behavior during school hours, but research shows sleep has a global effect on functioning. Previous studies have primarily focused on adolescent sleep needs. Therefore more research was needed on how sleep affects elementary aged children. The purpose of this study was to discover whether disturbed sleep, measured by a cutoff score on the Children's Sleep Habits Questionnaire (CSHQ), had a direct effect on behavior during the school day. Behavior problems were going to be measured by office referrals for infractions defined in the school district's discipline code. Not enough office referrals occurred for students whose parents participated in the study to complete data analysis as planned; however, results did indicate that the majority of students with disturbed sleep experienced difficulty with Morning Waking.
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TABLE OF CONTENTS

Abstract ......................................................................................................................................................... iii
Acknowledgments .................................................................................................................................... iv
LITERATURE REVIEW ............................................................................................................................. 1
  Background Information.................................................................................................................. 1
  Problem Definition....................................................................................................................... 3
  Sleep and Academic Performance ................................................................................................. 7
  Sleep and Behavior .............................................................................................................................. 8
  Importance of Sleep Education in Schools ................................................................................ 9
  Measures of Sleep............................................................................................................................... 12
  Purpose of This Study....................................................................................................................... 14
METHODOLOGY ....................................................................................................................................... 16
  Research Question ....................................................................................................................... 16
  Research Design............................................................................................................................. 16
  Participants........................................................................................................................................... 17
  Instrument............................................................................................................................................. 18
  Data Collection.................................................................................................................................... 18
LITERATURE REVIEW

Background Information

Sleep is an essential activity for all species (Dahl, 1999). Hypotheses have been made as to the functions of sleep, such as: integration of information, encoding information, converting short term memories to long term memory, and that these processes happen during a time when the brain is uninterrupted by incoming sensory information (Lambert, 2005; Zhang, 2004). The unresponsiveness of the body during sleep is the unique characteristic that restores the body and mind (Dahl, 1999).

Sleep is particularly important during periods of brain maturation (Dahl, 1999). Because good sleep practices are essential for children, sleep education should occur early and often during children’s education, yet schools and school psychologists often overlook sleep when thinking about “problem” students. Researchers estimate between 15% and 30% of children experience sleep problems at some point during childhood (Dawson, 2005). To put this statistic into perspective, the rate of prevalence for Attention Deficit/Hyperactivity Disorder (ADHD), a more widely publicized issue that often results in specially designed instruction, is 3% to 5% of school children (Dawson, 2005).
To better understand the ways that low quantity and quality of sleep affect children, it is important to first address some basic background information. There are two main types of sleep: rapid-eye-movement (REM) sleep, and non-REM (NREM) sleep (Dawson, 2005). Non-REM sleep consists of four stages. In stages I and II, sleepers are easily awakened, and in stages III and IV, it is difficult to rouse sleepers (Dawson, 2005). In REM sleep, dreaming occurs, the eyes move rapidly, and the body is essentially paralyzed because nerve impulses to muscles are blocked (Dawson, 2005). People feel the urge to sleep because of the release of the hormone melatonin, which begins to taper off as the hormone cortisol increases in the body, signaling wakefulness (Dawson, 2005). When this cycle occurs naturally, it is referred to as the circadian rhythm and is responsible for alertness in the morning and late afternoon hours, and sleepiness in the noon and evening hours (Sadeh, Raviv & Gruber, 2000).

There are four main effects of sleep loss: sleepiness, tiredness, changes in attention and performance, and emotional changes (Dawson, 2005). The hallmark of sleep loss is the increased effort it takes to perform the same emotional, physical, and cognitive tasks (Dahl, 1999). Sleepiness refers to the drowsy feeling one gets when engaging in less stimulating, or repetitive tasks; whereas tiredness can be defined as fatigue felt when the task at hand requires motivation, especially for an abstract reward (Dawson, 2005). Changes in attention and performance can mean children have more micro-sleeps or mental lapses while engaged in simple tasks. Further, students experiencing changes in attention and performance can have symptoms that mimic those of ADHD, or a lack of ability to complete tasks that
require sustained attention in two or more areas (Dawson, 2005). Finally, emotional changes from lack of sleep may result in children having greater fluctuations in emotional states and less control over emotions that increase their irritability, impatience, and tolerance for frustration (Dawson, 2005).

Problem Definition

Sleep habits of adolescents are a well-documented area of research. Evidence exists that hormonal and social changes contribute to greater need for regular nightly sleep, but adolescents often do not get the amount of sleep needed. For example, Noland and colleagues (2009) found that even when adolescents had knowledge of the amount of sleep they should be getting, and the consequences of not getting enough sleep, they were still not motivated enough to get adequate sleep.

Another large scale example of the research on adolescent sleep needs is the year the 17 public school districts in the Minneapolis area adopted delayed high school start times to examine the effects of approximately one more hour of sleep per night for students (Dawson, 2005). In this study, the districts reported some problems with the later start time, such as bus scheduling issues and making time for after school activities (Dawson, 2005). However, most effects were positive, including: students finding it easier to stay awake, especially during the first two periods of the day, less absenteeism, less depressive symptoms, less tardiness, and higher grades (Dawson, 2005). The question then becomes, could these positive effects be seen at the elementary level, as well?
Almost all of the literature points to the fact that more research is necessary to determine the effects of sleep deprivation in elementary aged children (Amschler & McKenzie, 2005; Buckhalt, El-Sheikh & Wolfson, 2009; Buckhalt, El-Sheikh, Keller & Kelly, 2009; Sadeh, Raviv & Gruber, 2000; Smedje, Broman & Hetta, 2001). Further research is important based on the findings of Sadeh, Raviv and Gruber (2000) that there were significant developmental processes in the sleeping and waking cycles of elementary age children.

One difference between studying the sleep needs of elementary aged children and adolescents is the strong influence parents still have on helping to form habits of children at the elementary age. If parents are not fully aware of the sleep and wake cycles of their children, it may be difficult to pinpoint the reason for children experiencing difficulty in school. Amschler and McKenzie (2005) found a large number of the fifth graders participating in their study stayed up late without their parents’ knowledge, and even more fifth graders reported waking up during the night without their parents being aware. Consequently, these students reported feeling sleepy two to four times per week (Amschler & McKenzie, 2005).

The reason lack of sleep negatively affects behavior and performance on academic and cognitive tasks is not fully understood (Buckhalt, Wolfson & El-Sheikh, 2007). Neuroscience research indicates brain processes that originate in the prefrontal cortex, like working memory, executive functioning and tasks that require simultaneous use of cognition and emotion are more affected by disrupted sleep (Buckhalt, Wolfson & El-Sheikh, 2007).
Children who have less control over their emotions may engage in risky behaviors, such as aggression toward others, unsafe driving, and promiscuous sexual behavior (Dahl, 1999). Owens, Fernando and McGuinn (2005) found that children with hospital records for frequent injuries had more sleep problems, which strengthens the indication that sleep loss leads to risky behaviors, which lead to injury. To combat sleep problems like not being able to easily fall asleep or wake up, students with access to substances like alcohol or caffeine may self-medicate (Dahl, 1999). Behaviors such as these can have dire physical, emotional, and educational consequences.

Some of the consequences of behaviors that affect school performance are tardiness or absenteeism, inattention, irritability, hyperactivity and impulsivity (Dawson, 2005). The National Heart, Lung, and Blood Institute Sleep Research Coordinating Committee found that some children will fight sleepiness during class with self-stimulatory behaviors which appear to be ADHD-like behaviors (NHLBI, 2009). Any of the aforementioned consequences of getting less sleep than necessary can then create a negative spiral of effects, meaning that acting out behaviors cause stress, and therefore could result in even less sleep.

Not only do typically developing children experience harmful side effects from lack of sleep, but children who have already been diagnosed with developmental or psychiatric disorders risk an exacerbation of disorder related symptoms (Dawson, 2005; Sadeh, Raviv, & Gruber, 2000). Dahl (1999) points out that medications used to treat psychiatric disorders often affect a child’s sleep, causing an increase in symptoms the medication is supposed to be helping to
control. Stein, Pat-Horenczyk, Blank, Dagan, Barak, and Gumpel (2002) found students who took methylphenidate for ADHD had a greater percentage of moderate to severe sleep problems than non-medicated peers and controls.

The authors of a study on Korean children who have already been diagnosed with sleep disordered breathing (SDB), the authors found the link between SDB and academic issues was not statistically significant, but the evidence supporting behavior problems like lack of impulse control, and inattentiveness was strong (Kim, Lee, Lee, Hong, & Cho, 2011). Finally, Smedje, Broman and Hetta (2001), support the notion that children experiencing familial or social stress also have a higher rate of sleep disorders.

Educators and other school personnel need to be aware they are in an excellent position to recognize signs of sleep loss in children. Amschler and Mckenzie (2005) demonstrated that teachers can be perceptive when it comes to recognizing sleep deprivation in children, especially elementary aged children who may not be able to articulate feelings of fatigue. Therefore, it is vital for practitioners to know where to refer sleep-deprived students if a sleep problem is suspected. To assist school personnel in perceiving sleep deprivation, education for teachers and students alike about the symptoms of sleep disorders, the consequences of lack of sleep, and the importance of adequate sleep is crucial (Dawson, 2005).

Wolfson and Carskadon (1998) urge schools to take a more active role in considering sleep in the context of grades, test scores, behavior problems, tardiness and truancy. This means that teachers, school psychologists, school nurses, or other non-instructional personnel should be considering sleep more when thinking about
students who are being brought to their attention for any of the aforementioned reasons. Dawson (2005) charges all school professionals with the task of screening for sleep problems when concerns arise about students’ attention or behavior, whereas Buckhalt, Wolfson and El-Sheikh (2007) remind us that simply remembering to be observant for behavioral signs of sleepiness is important.

Children who are experiencing any or all of the effects of lack of sleep, whether they are emotional like inattention, irritability, hyperactivity and impulsivity, or school-related like tardiness or absenteeism, are also not receiving the full extent of the benefits associated with school. Instructional time may be taken from themselves or others while teachers spending time recuing to task, determining appropriate consequences for behaviors, or catching up students who have been late or absent. There also may be social consequences if students are not able to interact with peers due to irritability, or because they have had to give up recess or other social times to complete missed or inadequately completed work, or because there have been behavioral problems. Thus, to give students the best opportunity to engage in the school environment, beginning with a night of good quality sleep is essential.

Sleep and Academic Performance

According to Buckhalt, El-Sheik, Holthaus, Baker, and Wolfson (2007), sleep deprivation has been found to negatively affect grades and standardized test scores. However, when some sleep disorders are effectively treated, there are gains in cognitive performance (Buckhalt, El-Sheik, Keller & Kelly, 2009). Noland, Price, Dake, and Telljohann (2009) note there is a relationship between REM sleep and
learning, which means during REM sleep information learned during the day is integrated into long term memory at night. Carskadon and Wolfson (2005) recommend researchers make a collaborative effort for dealing with sleep issues with administrators, parents, teachers and even teenaged students to be sure the students remain actively engaged in school.

Sleep and Behavior

Dahl (1999) indicates there is a convergence of evidence suggesting lack of motivation and changes in mood may be the most observable effects of sleep loss. This means that signs of low quality and quantity of sleep occur when students have trouble regulating emotions and behaviors. Wolfson and Carskadon (1998) found that students with “more irregular sleep schedules had more behavior problems” (p.884), which the authors interpreted to mean that poor sleep habits influence behavior and mood. Students reporting shorter nights of sleep experienced depressed moods, sleepiness during the day, and more problems sleeping. These authors proposed that the moodiness often associated with adolescence could be due to insufficient sleep, in that the effects of dysfunctional sleep patterns extended beyond daytime sleepiness to depression (Wolfson & Carskadon, 1998). Further, direct effects of low quality and quantity of sleep can create conflicts with parents when it is time to get out of bed and with teachers when students fall asleep in class (Dahl, 1999). Attention must be paid to sleep in cases of students who suffer from additional impairments or disorders because the symptoms of sleep loss so closely mimic other issues like school refusal or anxiety, depression, and ADHD (Dahl, 1999).
In an interesting study by Smedje, Broman, and Hetta (2001), it was discovered that 36% of children with sleep problems exhibited behavioral problems, and conversely, 15% of children with behavioral problems reported sleep problems, further strengthening the link between fragmented sleep and negative behavior. However, their results did not support whether the quantity of sleep affected behavior (Smedje, Broman, & Hetta, 2001). Their study went further to investigate which daytime behavior problems were caused by which specific sleep problem; for example, they found bedtime resistance was a “significant predictor of conduct problems” (Smedje, Broman, & Hetta, 2001, p. 6).

**Importance of Sleep Education in Schools**

Buckhalt, Wolfson, and El-Sheikh (2009) report that children experiencing stress can develop sleep problems that may develop into long-term issues. Best practices in school psychology continuously convey the need for prevention and early intervention in order to best serve students. Screening for sleep problems when there have been outward signs (i.e.: behavioral or emotional outbursts, academic problems, lack of impulse control, and so forth), may lead professionals and parents in the correct direction for treatment.

School psychologists can implement large-scale sleep intervention when there are stressful events such as high-stakes testing, or a school-wide, or national crisis (Buckhalt, Wolfson, & El-Sheikh, 2007). Before this can happen, continuing education on sleep, including, recognizing sleep problems, identifying children who are at-risk for sleep problems, and assessing sleep may be necessary (Buckhalt, Wolfson & El-Sheik, 2009).
Once sleep problems have been recognized, or if it is acknowledged there is a significant need for sleep intervention, it is equally crucial to have adequate education in place to teach children good sleep habits early and often. Intervention is applied in three levels called tiers. The first level, Tier 1, is prevention that is meant to be applied school-wide for the benefit of all students. Tier 2 becomes more intensive, with intervention applied to a class or small group of students, all of whom may be experiencing degrees of the same problems. Finally, Tier 3 is the most intensive with intervention designed to benefit individual students, to more specifically target challenges the student may be facing.

Some sleep curricula and lessons are already available. For example, a Tier 3 program might come from the National Sleep Foundation’s website, P.J. Bear’s Teaching Kids the Importance of Sleep (National Sleep Foundation, 2009). This website is designed to teach elementary aged children about the importance of sleep through the use of games that teach important sleep facts, and how to track their own sleep habits using an individualized sleep diary (National Sleep Foundation, 2009).

An example of a Tier 2 intervention at the middle school level is the National Space Biomedical Institute’s case study based approach to learning about sleep and circadian rhythms called “What’s Up with Jose?”, in which students are required to problem solve using their own sleep experiences to discover how the nervous system helps regulate behavior (National Space Biomedical Institute, 2009). The National Space Biomedical Institute also has also has a series of lessons called The Science of Sleep and Daily Rhythms which helps students understand the body’s
biological response to space travel, jet lag and daylight saving time (National Space Biomedical Institute, 2009).

Finally, a Tier 1 intervention to be used with all students at the high school level, there is the National Heart, Lung and Blood Institute’s Awake at the Wheel campaign (NHLBI, 2009). The website offers a brochure that can be printed out for students with information regarding reasons to get enough sleep, case studies about typical teenagers, a “you should know” facts section, and a sleep quiz (NHLBI, 2009). These are just some examples of quick and easy ways to incorporate lessons about sleep into curricula at any level.

Educators are not the only people responsible for making efforts to ensure good quality and quantity of sleep for children. Parents often have the most control over, and should be proactive partners about their children’s sleep. Strategies that parents can use to make sure their children get enough sleep should be taught to children while they are young, because good sleep habits developed early may carry over to adulthood (Buckhalt, El-Sheikh, Keller, & Kelly, 2009).

These strategies fall under the category of Sleep Hygiene. Examples of things parents can do to support good Sleep Hygiene are: monitoring and enforcing consistent bedtimes across weekdays and weekends, restricting use of electronic devices like televisions, computers and telephones in the hour before bedtime, avoiding caffeine and naps, especially late in the day, not sharing beds or rooms if possible, and modeling good sleep practices (Buckhalt, El-Sheikh, Holthaus, Baker & Wolfson, 2007).
In cases where good sleep hygiene practices alone are insufficient, more intensive treatments for children who have trouble sleeping might include cognitive-behavioral therapy (CBT), or relaxation techniques (Buckhalt, Wolfson & El-Sheikh, 2009). Some of the defining characteristics of CBT are the educational nature of therapy, and that it is directive and structured (National Association of Cognitive-Behavioral Therapists, 2010). In this way, distorted thinking or perceptions of students can be addressed and resolved in a safe environment, perhaps resulting in greater ease falling or staying asleep.

Relaxation techniques are another quick and effective way to ease anxiety leading to lack of sleep. These can take the form of progressive muscle relaxation (slowly tensing and relaxing muscles, working from toes to neck), deep breathing, yoga stretches or visualization of peaceful scenes (Segal, Saisan, Smith, Jaffe-Gill, & Segal, 2010). The brief nature of both these treatments mean they may be used in the school setting, but only in cases where outside help is not available for the student.

**Measures of Sleep**

There are two ways to measure quantity and quality of sleep. One way is through instruments that measure biological information straight from the body, and the other includes self-report measures such as questionnaires and surveys. The instruments used to measure sleep directly from the body are: polysomnography (PSG), and actigraphy. Polysomnography combines electroencephalography, electrocardiography, electromyography, oxygen saturation rates, and direct (or videotaped) observation by sleep clinic personnel (Buckhalt, El-
Sheik & Wolfson, 2009). Although PSG is often considered the best way to get accurate information about the exact nature of a person’s sleep (it is the only way to measure amount of time spent in each stage of sleep), it is very expensive, time consuming, and results may not even be accurate because the person is sleeping outside of his or her natural environment (Buckhalt, El-Sheik & Wolfson, 2009). Actigraphy, on the other hand, is now recognized as a valid and reliable measure of the sleeping and waking patterns in children (Buckhalt, El-Sheik & Wolfson, 2009). An actigraph is a small instrument worn like a watch on the arm or leg that measures the intensity and frequency of movement during sleep (Buckhalt, El-Sheik & Wolfson, 2009).

The other type, screening instruments, should include questions about typical bedtimes both during the week, and on weekends and holidays. Additional points often include whether or not the child has trouble falling or staying asleep, and frequency of nightmares (Dawson, 2005). Some of the most popular instruments used to measure quality and quantity of sleep are: Sleep Self-Report, School Sleep Habits Survey (which includes the subscale Morningness/Eveningness that is sometimes used as a stand-alone instrument), Children’s Sleep Habits Questionnaire, Teacher’s Daytime Sleepiness Questionnaire, Pediatric Sleep Questionnaire, the BEARS (Bedtime problems, Excessive daytime sleepiness, Awakenings during the night, Regularity of sleep/wake periods and average length of sleep, and Snoring), and the Sleep Disorders Inventory for Students (Amschler & McKenzie; 2005, Buckhalt, El-Sheikh & Wolfson, 2009).
Usually, sleep diaries that track bed- and wake-times, are used in conjunction with surveys and questionnaires (Buckhalt, Wolfson & El-Sheikh, 2007). Sleep diaries are an effective, easy and inexpensive way for people to track their own sleep habits. They can be created for personal use, or templates exist online. Most useful for schools are diaries that are very easy for children to use, including information about how many caffeinated drinks were consumed per day, how many hours were slept, and how the child felt the day after each night’s sleep (www.sleepforkids.org). In this way, key information regarding sleep habits are brought to the attention of sleep diary users, and may be able to be solved without medical intervention or give useful information to take to the doctor (www.sleepeducation.com).

**Purpose of This Study**

Luginbuehl, Bradley-Klug, Ferron, Anderson, and Benbadis (2008) demonstrated younger children exhibit symptoms of sleep disorders that are less severe than adolescents, therefore making them more difficult for professionals to discover based on rating scales. It is well documented that sleep research focuses on adolescents almost exclusively, but with the understanding that outward signs of sleep disturbances are more difficult to identify in young children, sleep research needs to focus more on elementary aged students.

The research that does exist on ways poor sleep affects behavior uses such measures as rating scales that assess anxiety or depression, behavior rating scales or teacher ratings (Buckhalt, Wolfson & El-Sheikh, 2007). This study is intended to add to the body of research concentrating on elementary aged children using a
measure that directly rated sleep rather than other emotional or behavioral symptoms, where raters were direct observers of sleep habits. This study examined the quality and quantity of students’ sleep, using the Children’s Sleep Habits Questionnaire (CSHQ), which is a rating scale that quantifies ways sleep can be disturbed, and the relationship of disturbed sleep to conduct in school that results in an office referral.
METHODOLOGY

Research Question

To discern the relationship between sleep and behavior problems, the parents of all third graders in three elementary schools in the Pickerington Local School District were asked to fill out the Children’s Sleep Habits Questionnaire (CSHQ) (Appendix A). Student sleep patterns were then compared with office behavior referrals. It was hypothesized that there would be a relationship between sleeping disturbances and behavior problems. For the purposes of this study, a sleep disturbance meant a score of 41 or higher on the CSHQ. In addition, this study examined which of the five areas of the CSHQ most affected children who experienced disturbed sleep. The null hypothesis is that there is no a relationship between sleep patterns and negative behaviors in the school environment.

Research Design

This study is categorized within the postpositivist paradigm, and includes both quantitative and qualitative data. Data were gathered in the form of scores on the CHSQ to determine sleep patterns. Scores from the CHSQ were compared with the number of office behavior referrals. Behavioral expectations in the Pickerington Local School District have been defined in a discipline code for Kindergarten
through sixth grade. This includes both a section detailing rules of conduct, which defines offenses, and a section outlining procedures to be administered in the event of an infraction of any of the rules. Examples of rules that may result in office behavior referrals include damaging school property, unauthorized touching or hitting others, bullying or disrespect. The disciplinary actions range from loss of recess to expulsion. The school discipline code was used to define negative behavior for the purpose of this study.

The CSHQ scores of children who had disturbed sleep were then further examined to determine if one area of the CSHQ is more highly affected than the others in predicting behaviors associated with disturbed sleep (i.e.: if there are higher scores on one subscale than the others). The variables in this study were the quality of sleep a child is getting (based on parent ratings on the CSHQ), and the number of behavior referrals to the office.

Participants

Participants in this study were all available third graders from three suburban elementary schools in the Pickerington Local School District. There were 55 total participants from three schools which ranged from suburban, low socio-economic status to semi-rural, higher socio-economic status. All schools began at 8:45 am, and one of the three schools offered a morning latchkey program, where students can be dropped off beginning at 7:00 am. Data were gathered on typical bed- and wake-times, however, it is not known how many children get to school earlier than the day begins. Demographic information based on racial make-up of sample was not assessed in the questionnaire, therefore information was not
provided by participants. The sample was a convenience sample based on available students whose parents consented to participation.

**Instrument**

The Children’s Sleep Habits Questionnaire was used to measure quality of sleep. This instrument was chosen because it specifically addresses the sleep habits of elementary aged children, which is the sample in question. The subscale reliabilities for the CHSQ range from .62 to .79 (Owens, Spirito, & McGuinn, 2000). Owens, Spirito, and McGuinn (2000), found the instrument correctly identifies 80% of the tested population as having a sleep problem at a statistically significant level of p<.001. A simple frequency count of office referrals was intended to represent the rate of behavior problems per child during a two-month period.

**Data Collection**

A letter was sent to potential participants’ parents through the teachers at each school. My contact information was provided for parents who had questions about the survey or the study in general. Parents who chose to allow their child to participate signed an informed consent form (Appendix B) that provided the details of the study, including the information they were giving me permission to access about their child. The form stated that names and any other identifying information would be kept confidential and would not be published or presented. Data collected during the study were kept in a locked box in the primary researcher’s home, and will be destroyed when the thesis project has been completed.

All parents who gave consent for their child to participate in the study were sent a copy of the CHSQ to fill out and return within one week. After the inventories
were returned and scored, numbers were assigned to the students. Next, the principal provided a list of students who had been referred to the office during a two-month time period. The planned procedure involved matching office behavior referrals to the students who experience disturbed sleep. However, there were only four office behavior referrals total during the data collection period. This number of referrals was too low to use the intended chi-square analysis.
RESULTS

The original intent of the study was to evaluate the null hypothesis that there would be no relationship between sleeping disturbances and behavior problems. A Chi-Square analysis was planned to analyze the data with a p value less than .01. However, when data were returned, there were not enough data for each of the variables to use this statistic, so results are summarized in qualitative format.

Instead of the originally planned methods of data analysis for the study, scores were compiled, first to determine what portion of the sample had disturbed sleep. Out of 55 total participants, 33 had disturbed sleep according to the CSHQ, which equates to 60% of the sample. Next, scores on subscales were placed into separate categories corresponding to each subsection of the CSHQ. Percentages were calculated to determine in which subsection participants were experiencing the most sleep difficulties. Out of this, the largest majority, 39 participants, or 71% of the sample had elevated scores in the area of Morning Waking, which consisted of items such as: child wakes up by him/herself, child wakes up in a negative mood, or child has difficulty getting out of bed in the morning.

The next largest portion of the sample had elevated scores in the area of Bedtime, with 64% of participants rating their children as engaged in the following behaviors two to seven times per week: falling asleep in parent’s or sibling’s bed,
resisting going to bed at bedtime, and being afraid to sleep alone. Twenty nine of the respondents, or 53% of the sample reported their children had difficulty in the area of Sleep Behavior, measured by the following items: child wets the bed, child talks during sleep, child sleepwalks during the night, and child snores and/or gasps during sleep.

Finally, the subscales Daytime Sleepiness and Night Waking had the least number of respondents reporting scores on items that happened more than once per week. In both cases 36% of children were reported to awaken more than once per night, returning to sleep without help after waking, or seem tired or fall asleep while riding in the car, watching television or playing alone.
DISCUSSION

The null hypothesis of no relationship between sleeping disturbances and behavior problems was not supported in this study, because of insufficient data supporting one of the variables: office behavior referrals. The CSHQ was used to determine which children were not getting good quality sleep, and the intention was that children identified as such were to be compared to school office behavior referrals to see if a relationship existed.

When the data were collected and analyzed, there were insufficient numbers of students whose parents participated by returning the survey, who were also experiencing behavior problems to the extent that an office behavior referral was necessary. One conclusion that could be made for this sample, is that since the number of behavior referrals was low, the teachers of third graders in these three schools were choosing to handle behavior incidents within the classroom, rather than referring students to the office.

Of the students who experienced poor quality sleep, as evidenced by a score on the CSHQ, the majority experienced problems in the area of Morning Waking. This information supports the idea that students who have difficulty getting out of bed in the morning, or take a long time to become alert after waking is the strongest predictor of poor quality sleep. Because of Sadeh, Raviv and Gruber’s (2000) finding
that there are significant developmental processes in the sleeping and waking cycles of elementary age children, the fact that the largest majority of the sample struggled with waking seems especially significant.

After the morning waking subscale, other subscales that showed effects on children who experienced disturbed sleep for this study included difficulty with bedtime, sleepy behavior, daytime sleepiness and night waking. These results suggest that for this sample, items falling in these subscales can be prioritized when considering intervention for poor performance in school or other activities. Behavior referrals were not found to be related to sleep issues in this study, however, these data indicate a large portion of this sample has sleep problems, even if mainly concentrated in the morning waking subscale of the CSHQ.

Limitations

Some potential limitations in this study involve the sample, or more specifically, the age of participants. The age was chosen due to a lack of research on sleep disorders and their effects on the lower elementary grades. Some items on the CSHQ are developmentally inappropriate for students this age. For example, some of the criteria penalized students for needing adults or siblings to wake them, or for resisting going to bed at bedtime. Answering that these were frequently occurring behaviors could heighten scores for children whose scores might otherwise have fallen below the 41-point cutoff score for the CSHQ, even though most third graders probably rely on adults to waken them in the morning, or express desire to stay up later engaging in preferred activities like watching television or playing.
Another limitation could be that parents of students who have a pattern of behavior referrals may have declined to participate. Additionally, honing in on a way to measure behavior more precisely, with more well defined parameters, at the classroom level, rather than by office behavior referrals may show more meaningful results for children who experience fragmented or fewer hours of sleep. Many times the effects of poor quality sleep are irritability, poor social behaviors (not getting along with peers), distractibility and lack of impulse control. These could lead to consequences such as loss of privileges like recess, or free times, but most likely would not result in a behavior referral to the office, a consequence reserved for more serious rule violations.

One of the schools whose students were included in the sample of this study offered morning and afternoon latchkey programs. Students in this study who participated in morning or afternoon latchkey were not isolated from the larger sample, therefore, it is impossible to tell which students may have been getting to school an hour or more before the 8:45 am school start time, or staying that length of time after school as well. Waking up to go to school very early in the morning because parents have early morning work hours could have a huge impact on morning waking being the area of most significant concern on the CHSQ.

Although the results from this study did not verify the original hypothesis, the value of the study is that most of the children with disturbed sleep could attribute this to troubles waking up in the morning. Future research may lead to links between putting children to bed at appropriate times to be sure morning waking is easier, or examining morning routines to be sure as much attention is paid
to waking up as going to sleep. The research conducted with this sample suggests we should consider sleep, especially in the area of morning waking, or later school start times, to make the sleep to school transition easier.

**Future Research**

Educators and future researchers can take note of the large majority of children who struggle with morning waking, and that this is significant to sleep research. However, the hypothesis that students who experienced sleep problems would exhibit behaviors that result in office behavior referrals was not supported by these data. It is important to note that this study did not take into account other behaviors in which sleep loss can manifest itself during the school day, like irritability, lack of focus or falling asleep in class. Nor did it take into account levels of behavior that are handled within the classroom setting that take away from instructional time, but are not serious enough to be referred to the office.

Future research in this area might focus more on students whose parents had an interest in discovering underlying causes for behavior problems during the school day. Additionally, comparing bed and waking times to find the total hours of sleep for each child would be interesting when considering the sample had the most difficulty with morning waking behaviors.

Finally, schools that offer morning and afternoon latchkey programs can offer unique circumstances for sleep research. Students who participate in latchkey programs may have earlier waking times depending on when parents drop them off at school than students who are arriving for the 8:45 am school start time. Further, students who attend latchkey programs in the afternoon get home later in the
evening, and may be rushing to attend evening activities like sports or other recreation programs, and then need to complete homework before going to bed. These circumstances could have an impact on morning waking behaviors, and should be considered in future research.
REFERENCES


APPENDIX A

Informed Consent to Participate as a Research Subject

Project Title: Educational Specialist, School Psychology Thesis “Effects of Sleep Habits on Children Displaying Behavioral Problems in School”

Investigator: Brooke L. Stanley, M.S.

Purpose of Research: This research will investigate whether there is a relationship between sleep patterns and behavioral problems in school that result in office behavior referrals.

Expected Duration of Study: This research should take less than 30 minutes for you to complete.

Procedure: You will fill out the Children’s Sleep Habits Questionnaire (CHSQ), which is a survey designed to determine whether children have trouble sleeping. There are 44 questions included which require respondents (ie: parents) to check whether a behavior occurs usually, sometimes or rarely, and four additional questions concerning their child’s bedtime, total time slept per day, and so forth. After the surveys have been filled out, they should be returned to the child’s homeroom teacher. They can be given to the child’s homeroom teacher, or sent to school in a backpack. The survey should be returned within one month of receipt. After the survey has been returned to the researcher, the researcher will score all of the surveys and determine which children have high scores. Your child’s rating will be compared to the number of office referrals within a two-month period.

Alternative Procedures: No alternative procedures exist in this research project.

Anticipated Risks and / or Discomfort: There is no anticipated risk or discomfort from participating in this research project.

Benefits to the Participant: By participating in this research, you will gain greater insight into your child’s sleep habits.
Confidentiality: No records of your participation in this research will be disclosed to others. Your data will be pooled with data from other research participants and only summary results will be made public. None of the following information will be revealed in any document resulting from this research: your name, your child’s name or any other identifying information, such as the name of the school in which the data was collected. Your data will be recorded anonymously. The records will be stored in the home of the graduate student and kept in a locked box. At the conclusion of the experiment, all records must be kept for three years. After this period of time, all data will be destroyed.

Contact Person for Questions or Problems: If research-related issues occur, or if you have questions about the research, contact Brooke Stanley, at brookelstanley@gmail.com, or thesis supervisor Sawyer Hunley at Sawyer.Hunley@notes.udayton.edu. Questions about the rights of the subject should be addressed to Mary Connolly, Chair of the Committee for the Protection of Human Subjects, Science Center Room 240C, +2320, (937) 229-3493.

Consent to Participate: I have voluntarily decided to participate in this research project, and to allow the researcher access to records of my child’s office behavior referrals. The investigator named above has adequately answered all questions that I have about this research, the procedures involved, and my participation. I understand that the investigator named above will be available to answer any questions about experimental procedures throughout this research. I also understand that I may refuse to participate or voluntarily terminate my participation in this research at any time without penalty or loss of benefits to which I am entitled. The investigator may also terminate my participation in this research if she feels this to be in my best interest. In addition, I certify that I am 18 (eighteen) years of age or older.

______________________________
Signature of Subject’s Parent or Legal Guardian for permission to access existing school records of office behavior referrals

______________________________
Signature of Investigator

☐ Please check this box and provide contact information if you would like to know your child’s rating on the CSHQ.
Name

Email address

Phone number
Informed Consent for [Insert Building Name] Building

**Project Title:** Educational Specialist, School Psychology Thesis “Effects of Sleep Habits on Children Displaying Behavioral Problems in School”

**Investigator:** Brooke L. Stanley, M.S.

**Purpose of Research:** This research will investigate whether there is a relationship between sleep patterns and behavioral problems in school that result in office behavior referrals.

**Expected Duration of Study:** This research should take less than 30 minutes for you to complete.

**Procedure:** The parents of all third graders in your building will be asked to fill out a survey called the Children’s Sleep Habits Questionnaire (CHSQ), which is designed to determine whether children have trouble sleeping. There are 44 questions included which require respondents to check whether a behavior occurs usually, sometimes or rarely, and four additional questions concerning bedtime, total time slept per day, and so forth. After the CHSQs have been filled out they will be returned to the child’s homeroom teacher within one month of receipt by the parents or in the child’s backpack. After they have been returned, the researcher will score all of the surveys. Then each participating child’s name will be compared to the office referrals made within a two-month period, to determine a relationship between sleep and behavior. Finally, if there are children with high scores on the CHSQ, who also are referred to the office because they exhibit negative behavior, their surveys will be further examined for patterns within the five sections of the CHSQ.

**Alternative Procedures:** No alternative procedures exist in this research project.

**Anticipated Risks and / or Discomfort:** There is no anticipated risk or discomfort from participating in this research project.
Benefits to the Participant: By consenting for your students to participate in this research, you will help families gain greater insight into sleep and how sleep affects behavior.

Confidentiality: Parents will be provided with an informed consent form that outlines the procedure of this study. Data from this study will be pooled from all participants and only summary results will be made public. None of the following information will be revealed in any documents resulting from this research: the names of children, parents or any other identifying information, such as the name of the school in which the data was collected. All data will be recorded anonymously. The records will be stored in the home of the graduate student and kept in a locked box. At the conclusion of the experiment, all records will be kept for three years, and after this time, all records will be destroyed.

Contact Person for Questions or Problems: If research-related issues occur, or if you have questions about the research, contact Brooke Stanley, at brookelstanley@gmail.com or (614) 226-4816, or thesis supervisor Sawyer Hunley at Sawyer.Hunley@notes.udayton.edu. Questions about the rights of the subject should be addressed to Mary Connolly, Chair of the Committee for the Protection of Human Subjects, Science Center Room 240C, +2320, (937) 229-3493.

Consent to Participate: I have voluntarily decided to participate in this research project. The investigator named above has adequately answered all questions that I have about this research, the procedures involved, and my participation. I understand that the investigator named above will be available to answer any questions about experimental procedures throughout this research. I also understand that I may refuse to participate or voluntarily terminate my participation in this research at any time without penalty or loss of benefits to which I am entitled. The investigator may also terminate my participation in this research if she feels this to be in my best interest.

______________________________________________________________
Signature of Building Principal ___________________________

______________________________________________________________
Signature of Investigator ___________________________

Date
APPENDIX C

Resources for Parents

For further information on sleep habits, and whether your child is getting enough sleep, please refer to the following resources.


Visit the American Sleep Association’s website and follow this link for an article titled “Sleep Problems in Children and How to Cope With Them”.

http://www.kidzzzsleep.org/readings.htm
The website Kidzzzsleep.org includes a list of suggested readings on the topics of pediatric sleep disorders, from diagnosis to treatment.

http://kidshealth.org/parent/general/sleep/sleep.html
Visit KidsHealth.org for an article on general sleep information, including how much sleep is necessary each year of your child’s life.

The National Sleep Foundation’s Sleep for Kids website includes information on good sleep hygiene habits, a sleep calculator, and a sleep diary, all in a kid-friendly format.