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Implementation of Sleep Problem Screening in a Pediatric Primary Care Office

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Implementation of Sleep Problem Screening in a Pediatric
Primary Care Office

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A DNP Clinical Scholarship Project Proposal submitted to
the Graduate School of the University of Missouri – St.
Louis in Partial Fulfillment of the Requirements for the
Degree of Doctorate of Nursing Practice

June 10, 2014

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Abstract

Sleep problems, a major problem for children and their parents, are the most common complaint brought to pediatric clinicians (advanced practice nurses and other healthcare providers) attention but are often ignored and underdiagnosed in the pediatric population (Faruqui, Khubchandani, Price, Bolyard, & Reddy, 2011). "Sufficient amounts of good quality sleep are necessary for healthy development in childhood" (Bordeleau, Bernier, & Carrier, 2012, p. 254). Inadequate sleep in children has been linked to numerous adverse outcomes psychologically as well as physically (Owens, Jones, & Nash, 2011). The American Academy of Pediatrics (AAP), issued recommendations in 2002 stating screening for snoring, one of the many sleep problems of childhood, should become a fixed component during well child exams (Erichsen et al., 2012). The purpose of this project was to promote awareness of sleep problems for preschool children aged three to five years old, in a pediatric primary care office setting by: (a) implementing a sleep problem screening project, (b) determining the prevalence of sleep problems, and (c) evaluating the sleep problem screening process. A 52-question, lengthy screening was easily administered in a well-established and busy pediatric practice with little to

no issues and a high level of cooperation from staff, clinicians, and parents/caregivers. The result of the screening revealed that more than half (63%) of children aged three to five years old had a positive score on the Children's Sleep Habits Questionnaire (CSHQ) indicating potential sleep problems. The most prevalent sleep problems were resistance going to bed at bedtime, child taking longer than 20 minutes to fall asleep after going to bed, child awakening once during the night, more than once during the night, and child unable to return to sleep without help after waking.

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Introduction

According to Bright Futures, a national health care promotion and disease prevention initiative, if clinicians discuss sleep patterns and problems at well child exams during childhood, they will gain important information into the child and family's development (Hagan, Shaw, & Duncan, 2008). Healthy People 2020 added sleep health as an objective with a goal emphasizing increasing public knowledge of the importance of adequate sleep and treatment of sleep problems to nurture health, productivity, wellness, and quality of life (United States [U.S.] Department of Health and Human Services [DHHS], August 1, 2013). The aim for this project was to increase awareness of the prevalence of pediatric sleep problems, to stress the importance of screening for sleep problems, to provide an effective screening tool, and to uncover specific obstacles and hurdles to screening these children. This project assessed the screening process from the clinician and caregiver viewpoints and provided resources to caregivers who participated in the screening.

The American Academy of Pediatrics (AAP) added screening for sleep problems, specifically snoring, to its list of guidelines in 2002 (AAP, 2013). Erichsen et al., (2012) reported that many primary care providers did not

follow the AAP recommendation to screen for sleep problems in children and found only one in four children were screened during well child visits. The Institute of Medicine (IOM) recommends that childcare providers should seek yearly advice from experts regarding healthy sleep practices along with health care professionals trained in how to counsel parents/caregivers about sleep hygiene (IOM, 2011). Bright Futures also supports the discussion of sleep habits between physicians and caregivers in order to gain insight into a child's development (Hagan et al., 2008). Faruqui et al. (2011) reported almost all pediatric primary care providers felt it was their responsibility to screen for sleep problems; however, the study found only one in five pediatricians received formal training on pediatric sleep disorders, which may lead to decreased knowledge and confidence in screening children.

"Insufficient and poor quality sleep is a significant and growing public health issue among children in America" (Owens et al., 2011, p. 345). Inadequate sleep not only affects children emotionally and physically, but a study by Owens et al., (2011) showed poor sleep in children can take a toll on caregivers as well, resulting in maternal depression and decreased levels of parental well-being. Owens & Jones, (2011), concluded in a study of parental

knowledge of healthy sleep habits in children, that recognition of potential sleep problems in children is vital and pediatric primary care settings are ideal to initiate the screening process.

Purpose of Project

The purpose of this pilot project was to promote awareness of sleep problems for preschool children aged three to five years old, in a pediatric primary care office setting by: (a) implementing a sleep problem screening project, (b) determining the prevalence of sleep problems, and (c) evaluating the sleep screening process.

Significance of Project

The objectives for this project on screening for pediatric sleep problems were based on a compilation of the goals for Healthy People 2020, AAP guidelines, Bright Futures guidelines and the recommendation of the Institute of Medicine (IOM). The lack of awareness of the frequency of sleep problems in the pediatric population is what led to the development of the objectives for this project (Spruyt & Gozal, 2011). The project objectives were geared toward increasing awareness of the prevalence of pediatric sleep problems, stressing the importance of screening for sleep problems, to provide the clinicians an effective screening tool, and assess the screening process from the

parent/caregiver point of view and provide resources to parents/caregivers who participated in the screening.

Project Plan

Project Outcomes

When it came to the topic of outcomes, careful consideration was given to both short-term and long-term outcomes. As far as short-term outcomes, the goal was geared toward the clinicians incorporating the Children's Sleep Habits Questionnaire (CSHQ) during well-child visits if parents/caregivers had concerns regarding their child's sleep. On the topic related to long-term outcomes, anticipation was focused on the parents/caregivers recognizing and handling sleep issues, which in turn would improve the health of the children. Clinicians recognizing when to refer a child to a sleep specialist was also an outcome that this project sought to achieve.

Many activities were implemented to produce progress in order to produce the desired outcomes. The first activity was the screening of the children and the education of the parents/caregivers. The support of the providers in the practice and other healthcare staff also played a major role in success. Primary care can at times portray monotony and this project stirred the interest in not only the clinicians, but everyone involved as well.

Stakeholders

Stakeholders were classified according to three categories: those affected, those involved in operations, and those who would use the evaluation results.

Those affected. Those affected by the sleep problem screening project were the parents/caregivers, children, and the clinicians. The parents/caregivers participated by filling out the screening. This required time, attention, and willingness to provide information regarding their children's and families' sleep habits. This project had an effect on the children since the project took place during scheduled visits. Lastly, the health care providers and staff at the clinic where the project was performed were affected in many ways. The nursing staff was required to notify the project director when a participant was available in order for completion of the survey prior to the provider seeing the child. The other clinicians had to be on board with the project and give permission for it to take place. Their patients were potential subjects in the project so without their support it may have hindered participation from the subjects.

Those involved in operations. There are many pieces to this puzzle that were required to make this project get off the ground. The necessary stakeholders involved in

operations were: myself (project director), project committee, sleep expert, clinicians, and office staff. The project director was responsible for all data collection, compilation, organization, and analyzing. The committee was needed to approve the project guidelines and set up and give ongoing direction. The expert, Dr. Shalini Paruthi, was the professional willing to donate her time and intellect to oversee operations in order to increase success. The clinicians and staff were involved for the same reasons mentioned above.

Those who use the evaluation results. Several groups would use the evaluation data as a result from the project. Parents/caregivers and children would benefit from the data the most. The results could be potentially life altering for many of these families affected by lack of healthy sleep habits and one or more sleep problems. The health care providers would also benefit because they would be given a screening tool specifically geared for preschool children that provides information regarding healthy sleep habits and potential red flags. The screening tool would also guide providers to know when problems are out of their scope of practice and the need for referral to a specialist. This would in turn address the most common complaint brought to clinician's attention, which would

allow them more time to devote to other health care concerns. The general public would also use these results. The goal was to publish the project findings in order to educate other clinicians to adopt a sleep problem screening tool.

Individual Stakeholders

There were several stakeholder organizations to engage for the project on pediatric sleep. These organizations include, but were not limited to: American Academy of Pediatrics (AAP), St. Louis Chapter of the National Association of Pediatric Nurse Practitioners (NAPNAP), National Sleep Foundation, and the American Academy of Sleep Medicine. The AAP and NAPNAP would benefit from the pediatric sleep data since they specialize in the population. The sleep organizations would benefit since pediatric sleep is a top priority in their research objectives.

Project Approval and Timeline

The medical director where the project launched approved the project along with the other clinicians and other office staff. After presenting this proposal the project was approved by the Institutional Review Board (IRB) through the University of Missouri-St. Louis. Washington University IRB approval was not needed after

some investigation. After approval through IRB, the proposal along with the IRB approval letter was sent to the graduate school for their authorization to begin.

Data collection consisted of 8 weeks ranging from three to five days per week at one office location until the goal of 120 subjects was met. Project costs for the implementation and completion of this project were approximately \$200 dollars. Clinicians and participants were not paid for their contributions or participation.

Theoretical Framework

Lewin's Change Theory (1951) was the theoretical framework chosen to guide this project on sleep problems. His theory on planned change is centered on the concepts of field and force. A field is also known as the system; if a change occurs in the field, then the whole system is affected (Lewin). According to Lewin, two forces are included in a change (driving forces and restraining forces); driving force fosters or aids movement in the new path, thus facilitating change. Restraining forces have the opposite effect, thus restraining change. Applying this theory would guide one to put emphasis on the driving forces and try to reduce the restraining forces in order to enable change to take place.

Lewin's (1951) change theory consists of a three stage process of unfreeze, change, and refreeze. Lewin's method provided a basis for understanding the process of planned change in this project. Planned change occurs by design in contrast to a change that occurs by accident (Lewin).

Unfreeze

Lewin's (1951) unfreeze stage involved preparing the organization to accept the change. This stage tends to be the most difficult and challenging stage because the change must be explained, needs assessed, and agreement that change is necessary (Lewin).

Change

Change is the stage where people start to accept the change and move toward the new direction; this stage tends to be the longest, and in order to accept the change, people must understand how the change will benefit them (Lewin, 1951). According to Lewin, not everyone will jump on the bandwagon as easily as others.

Refreeze

Lewin (1951) notes that this stage is ready when people have embraced the changes, changes are taking shape, and people feel stable and confident with the new changes. This is also the time to celebrate the success of the change (Lewin).

Lewin's Change Theory was used to guide this project and the clinicians to change how they practice when it comes to screening for sleep problems. This project proposed to raise awareness about sleep problems in preschool children aged three to five years old, in a pediatric primary care office setting, and implement and evaluate a sleep screening tool as a routine standard of care by showcasing the need. During the unfreeze stage, preparation for change was established by showcasing the need for screening. Initiation of the sleep screening process took place during the change stage. In the final phase of refreeze, the goal was for sleep screening to become part of routine well child visits for three to five year old children. The three stage process helped to prepare them for this change and accept it by making it a part of everyday practice. If other primary pediatric practices see the change was made without too many obstacles or difficulties, they too will be more willing to make the change of screening for sleep problems during routine visits.

Review of Literature

This section contains a comprehensive review of literature regarding pediatric sleep problems and the screening tools needed for clinicians.

Introduction

Sleep is just as essential to adults and children as food, water, and shelter. Many parents/caregivers underestimate the need for sleep for themselves and their children. Sleep problems are common in the pediatric population. They are the most common complaints brought to a health care professional's attention (Tikotzky & Shaashua, 2012). Lack of sleep education and screening for sleep problems in the pediatric primary care setting is a growing problem not only in the United States, but also all over the world (Owens & Mindell, 2006). Clinicians and parents/caregivers are undereducated about sleep requirements needed by children, as well as screening for sleep problems during routine healthcare visits (Owens & Jones, 2011). In order to understand abnormal sleep patterns in children, it is important to understand what normal sleep patterns entail.

Normal Sleep Patterns

There are two types of normal sleep experienced by children and adults during slumber. These are called rapid eye movement (REM) sleep, also known as active sleep, and nonrapid eye movement (nonREM) sleep, also known as, quiet sleep (Blum & Carey, 1996). How much sleep do children need? According to ("Children and sleep," 2011), children

require a certain amount of sleep based on their age: (a) newborns aged one to two months need to sleep a total of 10.5 to 18 hours per day and sleep is typically irregular with sleep periods ranging from minutes to several hours; (b) infants aged three to 11 months need to sleep a total of nine to 12 hours per night, naps during the day are anywhere from 30 minutes to two hours one to four times per day and by six months of age, many infants sleep through the night, and 70% to 80% by nine months of age; (c) toddlers aged one to three years need to sleep a total of 12 to 14 hours per 24-hour period and by 18 months of age, naps should be once daily ranging from one to three hours; (d) preschoolers aged three to five years need to sleep a total of 11 to 13 hours per night and many children drop their nap by five years of age; (e) school aged children five to 12 years need to sleep a total of 10 to 11 hours per night.

Definitions of Sleep Problems

There are 82 defined sleep disorders according to the International Classifications of Sleep Disorders, 2nd edition (ICSD-2) and they are classified under eight categories: insomnias, sleep related breathing problems, hypersomnias, circadian rhythm sleep problems, parasomnias, sleep related movement problems, isolated symptoms, and

other (*American Academy of Sleep Medicine, 2005*). Sleep problems in children can be classified as dyssomnias, parasomnias, and interference in sleep caused by other conditions (Blum & Carey, 1996).

Dyssomnias. These are categorized as disturbances in the quantity or timing of sleep. Dyssomnias include: interactional sleep problems such as night waking and sleep phase problems, and intrinsic sleep problems such as narcolepsy and sleep apnea (Blum & Carey, 1996).

Parasomnias. These are classified as abnormal behaviors that occur during sleep, which can include: night terrors, nightmares, sleep talking, and sleepwalking. These are the most common complaints of parents/caregivers to clinicians (Blum & Carey, 1996).

Other interferences in sleep. These include other factors that interfere in sleep including physical and mental conditions such as asthma, depression, and anxiety problems (Blum & Carey, 1996).

Abnormal Sleep Patterns in Children

There are a variety of sleep disturbances in children. According to Adachi et al., 2009, 20% to 30% of children exhibit bedtime issues and night awakenings. "ITSD (infant and toddler sleep disturbance), which includes difficulty settling or night waking may negatively affect the health

of children and parents/caregivers" (Adachi et al., 2009, p. 85). The common complaints include: night awakenings, difficulty falling/staying asleep, nightmares, snoring, restless leg syndrome, and nap difficulties (Mindell, Kuhn, Lewin, Meltzer, & Sadeh, 2006). Due to lack of screening and education by clinicians, the parental concerns are often brushed aside and parents/caregivers assume their children will outgrow sleep difficulties (Meltzer, Johnson, Crosette, Ramos, & Mindell, 2010). This lack of screening and understanding of normal and abnormal sleep patterns may lead to parental frustration and feelings of helplessness for both parents/caregivers and clinicians.

Night awakenings. Every person wakes up multiple times during a sleep period, but most of us return to sleep without difficulty (Moore, Meltzer, & Mindell, 2008). Children who wake during the night and are unable to fall back to sleep on their own, for whatever reason, meet criteria for the night awakenings category (Mindell et al., 2006). For infants and toddlers, night awakenings are the most common sleep problem accounting for "25% to 50% of children over the age of 6 months continuing to awaken during the night" (Mindell et al., 2006, p. 1264).

Nap difficulties/bedtime refusal. Nap difficulties happen when children refuse being put to bed even when

their parents/caregivers attempt to put them there. Stalling at bedtime is a very common tactic used by children, evidenced by repeated requests for multiple things (Blum & Carey, 1996). Children may also express fears of monsters, darkness, shadows, and separation from caregivers. Parents/caregivers often experience difficulty discerning opposition to being put to bed or attention seeking from true needs or fears (Blum & Carey, 1996).

Nightmares. Almost every child experiences nightmares at some point in their childhood. Nightmares are identified as frightening dreams that cause a child to awaken from REM sleep. Nightmares typically occur during the second half of the night. The child awakes fully and is scared; the child is able to recall the dream content. Nightmares are more common during periods of stress (Blum & Carey, 1996).

Night terrors. Night terrors are defined as episodes of fear, screaming, confusion, disorientation, and sitting upright in bed occurring while the child is asleep (Blum & Carey, 1996). Children most often experience night terrors during the first four hours of sleep and do not recall the experience. Parents/caregivers often describe the children during the terror as having a "blank stare" or "looking right through" them (Blum & Carey, 1996, p. 92).

Snoring. Snoring is the most common symptom of sleep-disordered breathing and occurs as a manifestation of "the vibrations of the oropharyngeal soft tissue walls that occur when an individual attempts to breathe against increased upper airway resistance during sleep" (Mindell & Owens, 2010, p. 100).

Obstructive sleep apnea syndrome. Obstructive sleep apnea is a problem in which breathing is momentarily and frequently disrupted during sleep; the apnea in sleep apnea represents a breathing pause that lasts at least the duration of two baseline breaths (Mindell & Owens, 2010). Obstructive sleep apnea occurs due to a total or partial blockage in the upper airway and can occur at one or more levels from the nose to the throat. The blockage can occur if tonsils and adenoid tissue are enlarged or if muscles in the throat relax too much during sleep, allowing the airway to collapse, regardless of efforts to breathe (Mindell & Owens, 2010).

Sleep walking. Sleepwalking is a common sleep problem affecting preschool and school age children (Mindell & Owens, 2010). These children appear to be awake but when asked questions or conversing may mumble and seem confused but in actuality, are in a deep sleep (Mindell & Owens, 2010). Sleepwalkers do not recall the events and

parents/caregivers need to be informed of the dangers of sleepwalking such as injury (Mindell & Owens, 2010).

Difficulty falling asleep/staying asleep/insomnia.

Insomnia is classified as difficulties falling asleep or staying asleep and can include early morning awakenings (Mindell & Owens, 2010). Insomnia can at times be a short-term problem or can be a cause of another underlying sleep problem (Mindell & Owens, 2010).

Restless leg syndrome. Restless leg syndrome is a neurological problem experienced by adults and children where the individual feels the need or urge to move their legs (Mindell & Owens, 2010). These urges to move the legs typically occurs in the evening hours, is worsened by inactivity and relieved by movement. The sensations in restless legs syndrome are often described as creepy-crawly, tingling, burning or pain. This may cause children to move or twitch in their sleep, which may lead to disrupted sleep and feelings of fatigue after a night of sleep (Mindell & Owens, 2010).

Periodic limb movement disorder. Periodic limb movement disorder is a related neurological problem to restless leg syndrome and often one accompanies the other. Periodic limb movements are characterized by repetitive movements during sleep, with at least 4 movements to count

a series, occurring at least 5 seconds apart and no more than 90 seconds apart. Children are unaware of the movements; the movements may cause arousal from sleep, and may lead to daytime fatigue (Mindell & Owens, 2010).

Narcolepsy. Narcolepsy is another neurological problem of sleep that lasts throughout one's lifetime and is considered chronic (Mindell & Owens, 2010). Characteristics of narcolepsy are excessive daytime sleepiness, sleep paralysis, cataplexy, and hypnagogic hallucinations. Additionally, automatic behaviors, disturbed nighttime sleep, lethargy, low motivation, depression, and poor concentration may co-occur (Mindell & Owens, 2010).

Enuresis. Enuresis is also referred to as bedwetting in children age 6 years and above. It is another common problem in childhood and may cause loss of sleep (Mindell & Owens, 2010).

Bruxism. Bruxism, also known as teeth grinding, is exhibited by recurring grinding or clenching of the teeth during sleep (Mindell & Owens, 2010). It can occur at any stage of sleep at any time of night and is extremely common in children (Mindell & Owens, 2010).

Consequences of Inadequate Sleep

Inadequate sleep in children leads to many problems including: poor grades, behavior issues, poor physical development, and obesity (Hall, Scher, Zaidman-Zait, Espezel, & Warnock, 2011). Poor sleep can have an impact when a child starts school because it can affect their physical health and well-being, social competence, emotional maturity, language and cognitive skills, and approach to learning, which are five of the fundamental school readiness skills (Quach, Hiscock, Ukoumunne, & Wake, 2011).

"Prolonged sleep deficits can result in chronic irritability, emotionality, and diminished attention span" (Blum & Carey, 1996, p. 90).

Parental Education

It is important to help parents/caregivers to understand the importance of establishing consistent bedtimes for preschool children. Advance practice nurses may play an important role in educating parents/caregivers about good sleep hygiene.

Sleep Hygiene. Sleep hygiene is a term that has been used to describe parent and child habits that encourage good sleep quality, adequate sleep duration, and prevent daytime drowsiness (Mindell, Meltzer, Carskadon, & Chervin,

2009). Another definition to describe sleep hygiene is the "establishment and maintenance of schedules and conditions conducive to healthy, restorative sleep" (Blum & Carey, 1996, p. 87). There are a few basic practices that can be put into place to help establish healthy sleep habits (Galland & Mitchell, 2010). "Sleep hygiene practices focus on consistent daytime and night-time practices that promote sleep and encourage non-problematic sleep behavior" (Galland & Mitchell, 2010, p. 851). These bedtime preparation practices include: bedtime routine, consistent bedtime, warm bath, reading, dark and quiet room, room temperature average of 69 degrees, consistent wake time, adequate daytime exercise, and no caffeinated beverages four hours before bedtime (Galland & Mitchell, 2010). Sleep hygiene is associated with improved quality and more adequate sleep among the pediatric population (Owens, Jones, & Nash, 2011). It has also shown to have a profound impact in predicting sleep quality and has been used extensively in trying to alleviate sleep problems in adolescents (Tan, Healey, Gray, & Galland, 2012).

Good Sleep Hygiene. Good sleep hygiene can be broken down into three categories: environment, schedule, and activities (Blum & Carey, 1996). The environment is most suitable for sleep if it is dark, quiet, and comfortably

cool; children's sleep schedules should consist of regular waking times, consistent nap lengths, and regular bedtimes. Parents/caregivers should shy away from frightening television or stories and vigorous physical behaviors in the hour before bedtime. Consistent bedtime routines and soothing methods, as well as putting the child to bed awake, are extremely important (Blum & Carey, 1996).

Methodology

Research Questions

This project includes the following research questions:

1. What is the prevalence of sleep problems in three to five year old children in a pediatric primary care practice?
2. What are the most prevalent sleep problems among three to five year old children in a pediatric primary care practice?
3. Is a sleep screening tool able to be effectively administered and accepted by parents in a pediatric primary care practice?
4. Can a quick two to three question tool effectively be used by clinicians to screen for sleep problems?

Setting and Sample

A pediatric primary care office located in a small suburb of a large Midwestern city servicing children aged

birth to 18 years was the setting for this project. Parents/caregivers brought their children in for well child exams as well as sick child appointments with same day access available. There were no walk-in appointments. This office accepted all insurance plans including government-funded insurance. Project participants were parents/caregivers of preschool children aged three to five years. Parents/caregivers were queried about their child's sleep during the office visit. Three to five year olds were the target age group for this project since many sleep problems arise during this time and the children are starting to verbalize fears and complaints (Moore et al., 2008). The goal for this project was to have 120 total participants with inclusion criteria consisting of any parent/caregiver of a child aged three to five years.

Protection of Human Subjects

Permission to initiate the project was obtained from the University of Missouri-St. Louis Institutional Review Board (IRB). Informed consent was obtained from each parent/caregiver prior to participation in the study (see Appendix 1). Data obtained from the screening tool was coded using a number, kept in a locked file cabinet and a password protected computer owned by the investigator.

Instrumentation

The Children's Sleep Habits Questionnaire (CSHQ); (Owens, Nobile, McGuinn, & Spirito, 2000), a parent reported instrument designed to identify the most common sleep problems in children, was used to screen the preschoolers for sleep problems. The CSHQ is a research tool used in research studies and is not yet validated as a clinical diagnostic tool (Spruyt & Gozal, 2011) (see Appendix 2). The CSHQ consists of 52 items, with the majority of items being Likert scale items (Usually [5-7], Sometimes [2-4], and Rarely [0-1]). Additionally, parents are asked if the sleep complaint is a problem: Yes, no, N/A. There are five qualitative questions about sleep time, amount of sleep, waking during the night, and morning waking; and checklists about when the child appeared sleepy or fell asleep during daily activities (Spruyt & Gozal, 2011). The CSHQ yields a total score along with eight scores on the different subscales (Luginbuehl & Kohler, 2009). The CSHQ evaluates children's sleep based on behavior within these eight different subscales: bedtime resistance, sleep-onset delay, sleep duration, sleep anxiety, night wakings, parasomnias, sleep-disordered breathing, and daytime sleepiness (Spruyt & Gozal, 2011). A total CSHQ score of greater than 41 has been reported as

a probable sleep problem, although there are no established norms for the total and subtotal scores (Goodlin-Jones, Sitnick, Tang, Liu, & Anders, 2008). The CSHQ can discriminate between a community sample of healthy children compared to a clinical sample comprised of children with sleep problems. The CSHQ has a sensitivity of .80 and an internal consistency of .68 of the community sample and .78 for the clinical sample (Luginbuehl & Kohler, 2009).

Procedure

When the parent/caregiver and child came in for their clinician visit, they were placed in an examination room for their initial physical assessment. The reason for the visit was established, and vital signs were obtained. Following this initial physical assessment, the parent was invited to participate in the project. An explanation of the project was given by the licensed APN/project director and informed consent obtained. After informed consent was obtained, the parent/caregiver completed the study assessment tools including questions on demographic information. The goal was for the parents/caregivers to complete the questionnaire while waiting to see the physician or provider, and take no longer than 15 minutes to complete. After completion of the research tool, the parent/caregiver gave the completed tool to the project

director for scoring. The project director gave the parents/caregivers their child's results along with sleep education resources about normal sleep and sleep problems. These resources included: websites, books, pamphlets, and pediatric sleep specialists in their area (Appendices 5,6,7). Parents who had concerns about their children's sleep habits were encouraged to discuss their concerns with their clinician.

Data Analysis

Descriptive statistics were used to analyze demographic data including age, gender, race, number of parents/caregivers, and diagnosis of intellectual or physical disability (see Appendix 4). To address the first research question, "What is the prevalence of sleep problems in three to five year old children in primary care," prevalence rates were calculated for those who met criteria for sleep problems in the population screened. To answer research question number two, "What are the most prevalent sleep problems among three to five year old children in primary care," prevalence rates were calculated for each parent reported sleep problem. To address the third research question, "Is a sleep screening tool able to be effectively implemented in a pediatric primary care practice," descriptive analysis was performed regarding the

survey, number of refusals, and disruption of clinic flow according to clinicians. The address the fourth and final question, "Can a quick two to three question tool effectively be used by clinicians to screen for sleep problems," qualitative short survey questions were included in the demographic portion of the survey that participants filled out. The qualitative short survey questions, specifically questions four, five, seven, eight, and nine were compared with the CSHQ, using correlation and five independent t-tests; calculation of sensitivity and specificity were also performed.

Errors

This process consisted of entering the collected data into SPSS. The advanced practice nurse was the person responsible for the entry, checking, tabulating and analyzing the data. This double entry of data was the main way to check for errors. A power analysis was conducted with the assistance of a statistician available for graduate students at the College of Nursing. Power analysis looked at the possible range of error for the measuring instrument and how that could affect the results of the screening project. The number of participants needed to participate in the screening project in order to

minimize error and show statistical significance was also determined at the same time.

Potential Biases

Possible biases can affect any project and must be taken into consideration before a project is launched. For the sleep project potential biases included:

- Children with sleep problems did not participate in the project
- Children with sleep issues were already referred to a specialist so their sleep issues had been resolved
- The parents/caregivers had taken the initiative and researched specialists on the internet and self-referred
- The reading level of material was too advanced and not easy to understand
- The population of participants for the project was not diverse

Another potential bias taken into consideration was the tool itself. It needed to be able to pick up the children with sleep problems correctly. If the tool were too sensitive, then it would only obtain the extreme children and if the tool was too specific, some children with sleep problems would be missed. Trial and error and pilot testing would potentially help with this issue.

Potential biases were evaluated often during the entire project process.

Results

There were 121 parents/caregivers of children aged three to five years that consented to participate and completed the demographic information form. Of the children screened for sleep problems 62 (51%) were female and 59 (49%) were male. Demographics include: 114 (94%) White; 1 (0.8%) black; 1 (0.8%) Asian; 1 (0.8%) Hispanic; and 4 (3%) children were mixed race. The mean age of children screened was 3.8 years (SD = 0.78) and ranged from children aged three to five years. Out of the children screened, 74 (61%) were in pre-kindergarten, 9 (7%) in kindergarten, 17 (14%) in daycare, and 20 (17%) were at home with their caregivers/parents. Most of the children came from two parent/caregiver households 111 (92%); 2 (2%) were from single parent/caregiver households; and the remaining 6 (5%) were from split parent households.

Project Question 1

In order to address the prevalence of sleep problems in children aged three to five years in a primary care practice, prevalence rates were calculated. Children who scored > 41 on the CSHQ met criteria for possible sleep problems. There were 76 (63%) children aged three to five

years in this pediatric primary care practice who had a positive screening result indicating a potential sleep problem.

Project Question 2

Question 2 sought to determine the most prevalent sleep problems among children aged three to five years in a pediatric primary care practice. For this project, a sleep problem was identified by the parent/caregiver by marking "yes" following questions on the CSHQ. Not all parents circled either yes or no, so the number of responses varied. The most common sleep problems identified by parent/caregiver were child resists going to bed at bedtime (18.6%) and child takes longer than 20 minutes to fall asleep after going to bed (17.4%). Note, the two questions and responses were the same for bedtime and sleep behavior subscales (see Table 1).

Table 1.

*Sleep problem with Questions by Number of Parent/Caregiver
Yes Responses and Valid Percent.*

Sleep Problem with Questions	N	Yes	Valid %
Bedtime			
Child resists going to bed at bedtime	86	16	18.6
Child falls asleep within 20 minutes after going to bed	86	15	17.4
Sleep Behavior			
Child resists going to bed at bedtime	86	16	18.6
Child falls asleep within 20 minutes after going to bed	86	15	17.4
Waking During the Night			
Child awakes once during the night	79	8	10.1
Child awakes more than once during the night	81	8	9.9
Child returns to sleep without help after waking	81	8	9.9
Morning Waking			
Child wakes up very early in the morning	84	5	6.0
Child has a good appetite in the morning	85	4	4.7
Daytime Sleepiness			
Child naps during the day	79	2	2.5
Child seems tired	80	2	2.5

Project Question 3

Of particular interest in this project was whether a sleep screening tool could be administered effectively and accepted by parents in a pediatric primary care practice. Qualitative analyses were utilized. Of the 122 parents/caregivers approached to participate in this project only one refused. On average, it took 12 minutes to complete the survey materials and 75% of participants completed the materials prior to the clinician entering the patient examination room. Clinicians at the practice where the project took place were very pleased with the lack of

disruption of flow to the practice and were eager to see the results of data analysis.

Project Question 4

This project sought to determine if a quick two to three question tool could be used effectively by clinicians to screen for sleep problems. The investigator and sleep expert developed five questions based on expert experience as a clinician in a sleep center that were similar to the questions on the CSHQ. Parents/caregivers marked "yes," "no," or "I don't know" to each of the five questions:

1. Does your child take longer than 30 minutes to fall asleep?
2. Does your child snore?
3. Does your child have growing pains?
4. Does your child wake up in the middle of the night and come looking for you?
5. Is going to bed a problem for your child on most nights of the week?

Analyses were performed to evaluate positive screens on the short survey with positive screens on the lengthy CSHQ (score > 41).

Table 2.

Yes No Responses to the Short Survey Questions by >41 on the CSHQ and <41 on the CSHQ

Short Survey Questions	Yes/No	CSHQ > 41	CSHQ < 41
>30 min to fall asleep	Yes	32	4
	No	44	39
Snore	Yes	30	8
	No	44	36
Growing Pains	Yes	12	5
	No	48	36
Night Awakening	Yes	57	15
	No	19	29
Bedtime Resistance	Yes	32	1
	No	43	43

A correlation between the CSHQ and the short survey was performed and sensitivity and specificity of the CSHQ scores were compared with the short survey results (see Table 2). There was a strong positive correlation between the CSHQ and the five questions on the short survey ($r = 0.67$, $p < 0.001$). Examination of short survey question taking longer than 30 minutes to fall asleep resulted in a sensitivity of 42% and specificity of 4%; snoring, 41% sensitivity and 18% specificity; growing pains, 20% sensitivity and 12% specificity; bedtime resistance, 43% sensitivity and 2% specificity; and to night awakenings was the most impressive result of 75% sensitivity and 43% specificity.

A minimum of four questions on the short survey needed to be answered yes in order for participants to meet

criteria for a positive score on the CSHQ. Those who responded yes to all five questions on the short survey also met criteria for a positive CSHQ. The mean CSHQ score for those who said yes to four of the questions on the short survey was 54.67 with a SD of 7.8 with a range of 45 to 68 indicating everyone who responded yes to four questions on the short survey met the criteria for a positive CSHQ score. Three yes responses on the short survey was insufficient for these same children to all meet a CSHQ score of > 41. Interestingly, the mean score of 51.05 suggested a positive screen on the CSHQ, however the range of scores included some scores that did not exceed the cut off score of > 41 on the CSHQ.

Discussion

Sleep problems are a major concern for parents of children aged three to five years in pediatric primary care settings. This lengthy screening was easily administered in a well-established and demanding pediatric practice with little to no issues and cooperation from staff, clinicians, and parents/caregivers. The result of the screening revealed that more than half (63%) of children aged three to five years old screened had a positive score on the CSHQ indicating potential sleep problems. Results from this project are similar to previous studies that reported

sleep problems are the most common complaints by parents/caregivers in the pediatric population (Tikotzky & Shaashua, 2012). A study conducted by (Meltzer et al., 2010), looked at the prevalence of sleep disorders in pediatric primary care practices and concluded that behavioral insomnias of childhood which include problems going to bed and night waking affect 20% to 30% of children aged three to five years. Another study performed by (Mindell et al., 2006) discussed similar results when comparing studies regarding bedtime resistance and night wakings and reported that 20% to 30% of young children in cross sectional studies are reported to have considerable problems going to bed. In a study by Owens & Jones, (2011), researchers concluded that primary care practices are the perfect place to initiate screening for sleep problems. This project supported this finding by demonstrating the ease of screening for both the clinicians and parents/caregivers. Often clinicians feel a responsibility to screen for sleep problems but do not because of a lack of formal training and confidence in screening (Faruqui et al., 2011). This project demonstrated that a short survey tool with similar findings to the CSHQ and may be piloted in a primary care practice

using the five project questions to determine if it is a reliable tool to detect sleep problems.

In this project, the most prevalent sleep problems were resisting going to bed at bedtime, child falling asleep after 20 minutes after going to bed, child awakening once during the night, more than once during the night, and child able to return to sleep without help after waking.

The CSHQ was well accepted by parents/caregivers as evidenced by only one person refusing to participate after discussion of the questionnaire and additional questions. The majority of participants were able to complete the survey before being seen by the clinician. Clinicians in this project were pleased at the lack of disruption to the flow of everyday practice.

There was a strong positive correlation between the CSHQ and the short survey. Sensitivity and specificity of the short survey questionnaire were not strong except for the question pertaining to night waking. A minimum of four questions on the short survey needed to be reported positive in order for all participants to meet criteria for a positive screen on the CSHQ. Anything less than four was not sufficient for a reliable positive score on the CSHQ. The five-question tool demonstrated potential to be a short screening tool that primary care clinicians could use to

screen for sleep problems. Further research is needed to determine if this five question screening tool can be a reliable and valid screening tool.

This project sought to determine if the six prevalent sleep problems identified by participants would also be identified using the five question short survey. The top problems were: child resists going to bed at bedtime, child falls asleep within 20 minutes after going to bed (bedtime and sleep behavior $n = 4$), child awakes once during the night, and child awakes more than once during the night. Results suggest that these sleep problems were identified using the short survey questions: does your child take longer than 30 minutes to fall asleep, does your child wake up in the middle of the night and come looking for you, and is going to bed a problem for your child on most nights of the week?

Barriers

There were many factors and trends in the larger environment that could have influenced the sleep screening project in a positive or negative way. This project involved participation from family members and staff. One of the major factors of participation was the amount of time involved to get the information needed for a successful project. The ability to market the project to

physicians and advanced practice nurses was effective since they were on board.

There were many issues to consider when interpreting data. Possible barriers included: data collection performed properly and parents/caregivers given enough time to complete the questionnaire. These were just a couple of the issues of context to consider when data was being interpreted. Another issue in need of consideration was social desirability because parents/caregivers may have wanted to appear that they were aware of their child's sleep habits and doing things as recommended. Making things as anonymous as possible and normalizing negative answers to as much as possible helped to prevent this type of bias. Another way to try and combat this issue was to evaluate this concept with the pilot testing planned before project initiation.

A barrier that was not considered at the start of the project was bad weather. The data collection portion took place in the dead of winter so there were multiple days that patient flow was low and the investigator could not get to the clinic on some days.

Evaluation

Evaluation Questions

- Were the stakeholders on board and feeling as if they were part of the process? This was evident by their continued support for the project.
- Did the project interfere with day-to-day office activities?
- Were there enough participants in the project?
- Did we see the outcomes we thought we would see?
- Did we see a high prevalence of sleep problems?
- Did the screening tool provide data for the project?
- Were the caregivers of children participating in the project satisfied with the resource material?

The stakeholders and committee members received these evaluation questions, and feedback was discussed at length.

The purpose of the evaluation was to gain new knowledge about project activities, improve existing project operations, determine the effects of the project, and to assess teaching. The users of the evaluation were the stakeholders discussed earlier. Dissemination of results will lend information regarding the prevalence of pediatric sleep problems and pinpoint the areas of the project that need improvement. If the project is effective in this particular practice, the results could potentially

be expanded to other pediatric primary care practices by routinely screening for sleep problems during well child visits.

This project consisted of the CSHQ screening tool for pediatric sleep problems as discussed previously. Evaluation to make sure the tool being used was appropriate in getting the information needed for the project will take place. The project will be considered a success if the screening is able to be incorporated into everyday practice without disruption, sleep problem screening becomes a part of well child visits, and the clinicians understand and see the need for sleep problem screening.

The evaluation design and gathering credible evidence portion of this project was ongoing and was monitored throughout the entire process. Focusing on the evaluation was critical since not every part of the project needed to be evaluated all the time. Projects are always ready for evaluation and it is a necessary part in order for any project to succeed. Once the focusing evaluation design and gathering credible evidence steps were completed we can move on to the step consists of interpreting data and justifying conclusions.

When interpretation of the findings began, it was important to keep the goals of the project and its audience

in mind. What did the stakeholders need and want to know about the results of the project? Limitations of evaluation included possible biases, validity of results, and reliability of results. It was extremely important when interpreting results to keep the stakeholders interests in mind. The sixth and final step ensured that the evaluation findings would be used.

The stakeholders were supplied with facts that focus on the positive results, yet truthful of the negative results. Data tables and technical jargon were avoided to keep the information simple and concise. This helped to decrease the misinterpretation of information. Preparing the stakeholders strengthened their ability to translate new knowledge into appropriate action. Discussion of how potential findings would affect decision-making, exploring positive and negative implications of potential results and identifying different options for project improvement were also part of the preparation piece. It was important to emphasize why the evaluation results were important for practice.

A high prevalence in pediatric sleep problems was an anticipated result of the study and screening was essential in the anticipatory guidance aspect of well child visits. It could easily be incorporated into routine screening with

the use of the electronic medical record. The positive evaluation findings showed the stakeholders that a practice change is needed in regard to educating parents/caregivers about healthy sleep habits. As far as the public image of the project, the practice where the project was performed was recently purchased. If the buyers see that this practice is promoting education and implementing changes in practice, this would be seen as a positive for the clinicians in other practices. Follow up meetings with the stakeholders continued throughout the study in order to keep them informed as to the project's progress.

Application into Practice

After data collection was completed and analyzed, reports were sent out. These reports consisted of tailored information specific for each segment of the participants. The results were presented in a clear and succinct manner and summarized the stakeholders' roles and involvement in the process. The strengths and weaknesses were discussed at length along with the advantages and disadvantages of the recommendations found from the results of the study.

Verification of accuracy of reporting was reviewed along with examples, illustrations, graphics, and stories to better share results of the project. Results were

disseminated in a timely manner to as many stakeholders as possible. Technical jargon was avoided at all costs.

Dissemination

Dissemination involves communicating evaluation procedures or lessons learned to the stakeholders in a timely, unbiased, and consistent manner. The goal is to achieve full disclosure and impartial reporting. This was achieved through a letter sent out to all of the stakeholders informing them of the evaluation results of the project. Producing several reports that were tailored for individual stakeholders was extremely important. Parents/caregivers and clinicians want to know different parts of the evaluation process and it is critical to give them the results that will benefit them the most. The evaluation findings will be submitted for publication to peer-reviewed journals. The findings will also be submitted to local and national nursing conferences for presentation. An abstract for this project was recently sent in to the National Association of Pediatric Nurse Practitioners for a poster presentation for the March 2015 conference in Las Vegas.

Accomplishment of DNP Essentials

The American Association of Colleges of Nursing task force has published a DNP position statement calling for a

transformational change requiring professional nurses who wish to practice at the highest level to receive a doctoral degree (AACN, 2006). They listed eight essentials for DNP projects including scientific underpinnings for practice, organizational and systems leadership for quality improvement and systems thinking, clinical scholarship and analytical methods for evidence based practice, information systems/technology and patient care technology for the improvement and transformation of health care, health care policy for advocacy in health care, interprofessional collaboration for improving patient and population health outcomes, clinical prevention and population health for improving the Nation's health, and advanced nursing practice (AACN, 2006).

This project on pediatric sleep problems relates to the DNP essentials. Working toward the completion of the DNP degree and the DNP clinical scholarship on the prevalence of pediatric sleep problems in a private primary care office is one way. This study will encourage clinicians to screen for sleep problems during well child exams, which will promote health for our nation's children. Clinicians and parents/caregivers will work together in collaboration with screening children and can improve health outcomes. This project has the possibility of

impacting policy by making screening a routine part of well child exams. Evidence based guidelines were reviewed so the latest, most correct science could be incorporated into day to day medical practices. In essence, this project provided a pathway for quality improvement and transformation of healthcare in the clinical setting as the published guidelines were incorporated into the practice. In this project, interprofessional collaboration of physicians and nurse practitioners occurred to improve patient screening, which may improve health outcomes.

Implications for Practice and Further Research

This project demonstrated that introducing a sleep screening tool into practice could be done with minimal problems if collaboration between staff and clinicians occurs and is supported. This project demonstrated that clinicians could have waiting parents/caregivers complete a lengthy sleep questionnaire, prior to the clinician entering the room, without disrupting the workflow in a busy practice. Review of the completed questionnaire quickly for positive responses can then be used to provide further evaluation, treatment and education of sleep problems in a focused manner. This project also revealed that a shorter survey may be able to identify those with potential sleep problems but would need further research to

determine its effectiveness. Studies should be conducted in other primary care offices with more diverse populations and in more diverse areas to determine if there is as great of a need for screening as there was in this population screened.

Further research could include development of an even shorter survey than the survey of five questions used in this project. A shorter survey will prove useful in busy practices. As the health care system reforms and evolves and a more medical home approach is taken, providing comprehensive child care is mandatory and should include screening for potential sleep problems at all well child visits. It has been reported often that when children have disrupted sleep from sleep disorders, parents and siblings may also have disrupted sleep as a result, thus affecting the entire family.

Limitations

Limitations to this study must be considered. The parent report measure can lead to bias in reporting results. Parents/caregivers were only asked to report behaviors from the past one week time period, which could have missed some problem behaviors. Another limitation was the lack of diversity in the sample. 94% of the children screened were white which may not generalize to samples in

other parts of the community. Another limitation was the length of the CSHQ. Parents could have felt rushed to finish and not read each question thoughtfully to answer accurately.

DNP Influence on APRN Practice

After working in primary care for several years I noticed parents/caregivers of the children I treated most often asked questions regarding sleep and problems associated with sleep. A sleep screening tool can be initiated but it takes work and collaboration from every part of the medical team. Throughout the DNP program we have learned to engage members of a team, including other professions, and how to make a project successful. This educational experience has also taught us how to evaluate and make changes to a program to make it more successful. As DNPs it is our job now to translate the evidence based research into practice in order to better improve the health outcomes for our patients. This screening tool could not only improve the health of the patients but the health of parents/caregivers, too. DNPs have an amazing opportunity to educate our patients, educate other members of our team, and future DNP students!

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Appendix 1



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Informed Consent for Participation in Research Activities
Implementation of Sleep Problem Screening in a Pediatric Primary Care Office

Participant _____

HSC Approval Number

Principal Investigator _____

PI's Phone Number

-
1. You are invited to participate in a research study conducted by Jennifer O'Donnell, RN, PNP-BC, a Doctor of Nursing Practice Student at the University of Missouri St. Louis and Susann Farberman DNP, Med, CPNP-PC . The purpose of this research is to learn how to make screening for sleep problems in children easier to do in a pediatric primary care setting.
 2. a) Your participation will involve:
 1. Signing this consent form if you wish to participate. You may choose not to participate.
 2. Completing a demographic information sheet with a few questions about your child's age, race, if they go to day care or pre-kindergarten, number of caregivers, and 9 questions about your child's sleep patterns, and if you have talked to your pediatrician or advanced practice nurse about how your child sleeps.
 3. Filling out a Children's Sleep Habits Questionnaire that asks about your child's sleep habits and possible difficulties with sleep. This questionnaire includes questions about bedtime, sleep behavior, waking at night, waking in the morning, and daytime sleepiness.

This Children's Sleep Habits Questionnaire helps us determine if your child may have sleep difficulties. This questionnaire is a screening only and will not be used to diagnose any sleep problems. You will be given your child's questionnaire results

immediately following completion of the survey. You will also be given a packet of resource materials consisting of sleep information including websites, books, and local sleep specialists contact information.

Approximately [100 to 120] may be involved in this research.

- b) The amount of time involved in your participation will be about 15 to 20 minutes.
- 3. There are no anticipated risks associated with this research.
- 4. There are no direct benefits for you participating in this study. However, your participation will contribute to the knowledge about children's sleep problems.
- 5. Your participation is voluntary and you may choose not to participate in this research study or to withdraw your consent at any time. If you choose not to participate it will not negatively impact your child's treatment in any way today or ever. You may choose not to answer any questions that you do not want to answer. You will NOT be penalized in any way should you choose not to participate or to withdraw.
- 6. By agreeing to participate, you understand and agree that your data may be shared with other researchers and educators in the form of presentations and/or publications. In all cases, your identity will not be revealed. In rare instances, a researcher's study must undergo an audit or program evaluation by an oversight agency (such as the Office for Human Research Protection). That agency would be required to maintain the confidentiality of your data. In addition, all data will be stored on a password-protected computer and/or in a locked office.
- 7. If you have any questions or concerns regarding this study, or if any problems arise, you may call the Investigator, Jennifer O'Donnell (314) 323-0075 or the Faculty Advisor, Susann Farberman (314) 516-6067. You may also ask questions or state concerns regarding your rights as a research participant to the Office of Research Administration, at (314) 516-5897.

I have read this consent form and have been given the opportunity to ask questions. I will also be given a copy of this consent form for my records. I consent to my participation in the research described above.

Participant's Signature

Date

Participant's Printed Name

Signature of Investigator or Designee
Date

Investigator/Designee Printed Name