

Nocturnal Enuresis in Children

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ABSTRACT

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The purpose of this study was to determine the prevalence of bedwetting in children aged 6-10 years of age and to investigate parental knowledge and attitudes toward children who suffer from nocturnal enuresis. Research was conducted during the spring of 2002 by sending home a questionnaire to randomly selected parents of Kindergarten, 1st Grade and 4th Grade students in a large school district in northwestern Wisconsin. Research indicated that most children achieve normal continence by the age of five to six years. Bedwetting at night is not considered significant until a child is older than six years of age and has either established dryness and is experiencing a relapse as in secondary nocturnal enuresis or has never established dryness such as in primary nocturnal enuresis. Research

also indicated that enuresis is prevalent in 7% to 20% of males and 3 % of females ranging from ages 5 to 7 years of age. At age 10, the prevalence is 3% in males and 2% in females. Typically by the age of 15, most children have outgrown bedwetting. In most cases the cause of bed-wetting is unknown.

Upon completion of this study the researcher found a higher prevalence of bedwetting behavior among the respondents than research indicated. Parental attitude toward bedwetting was found to be very supportive. Although parental knowledge of the cause of bed-wetting was limited, their reaction to it was positive and supportive.

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CHAPTER I

Introduction

Nocturnal Enuresis in Children

Does the early morning scene of wet linens, soaked smelly pajamas, and an uncomfortable child sound familiar? This is a picture of nocturnal enuresis. “Enuresis is the loss of bladder control that leads to the release of urine” (Cendron, 1999, p. 1219). There are several forms of enuresis. For the purpose of this paper, two will be identified. Primary nocturnal enuresis (PNE) consists of never having established urinary continence at night, while secondary nocturnal enuresis (SNE) refers to the development of enuresis after a period of established urinary continence (DuMars, 1999). Nocturnal enuresis, also called bed-wetting, happens during the night while the child is sleeping. Many times the child has no control over this elimination, nor is he or she aware that it is happening.

Each morning an estimated five to seven million children wake up in a wet bed due to primary nocturnal enuresis or nighttime bedwetting (Cendron, 1999; Du Mars, 1999; Nemours Foundation, n.d.; USA Today, 1997). According to the American Psychiatric Association’s Diagnostic and Statistical Manual of Mental Disorders (DSM-IV) clinical enuresis is defined as the repeated voiding of urine into bedclothes - whether involuntary or intentional.

The behavior is clinically significant as manifested by either a frequency of twice a week for at least three consecutive months or the presence of clinically significant distress or impairment in social, academic (occupational), or other important areas of functioning. Chronological age is at least five years (or equivalent developmental

level). The behavior is not due exclusively to the direct physiological effect of a substance (e.g. a diuretic) or a general medical condition (e.g. diabetes, spina bifida, a seizure disorder) (cited in Goin, 1998, p. 277-278).

It is estimated that 15% to 20% of children wet the bed frequently enough to be considered enuretic (Husain & Cantwell; Walsh & Menvielle; cited in Fletcher, 2000). Enuresis is prevalent in 7% to 20% of males and 3 % of females ranging from ages 5 to 7 years of age. At age 10, the prevalence is 3% in males and 2% in females ((American Psychiatric Association; cited in Fletcher, 2000, p. 33). Typically by the age of 15, most children have outgrown bedwetting.

“Medical authorities agree that urinary control begins around age three in the average child and that bedwetting is not considered to be a behavioral or medical problem unless it persists after the age of five (for females) and six (for males)” (Warzak; cited in Du Mars, 1999, p. 211). Primary nocturnal enuresis in children from 5 to 10 years of age will be the focus of this research paper. The reason PNE was chosen is that “approximately 80% of clients diagnosed with enuresis have primary enuresis” (Doleys; Walsh & Menvielle; cited in Fletcher, 2000, p. 32).

Nocturnal enuresis can take a toll on a child’s self-esteem and is a frustrating problem to parents. The parent is typically the one responsible for the clean up after an accident and is also typically charged with finding a cure for the problem (Goin, 1998). This problem can be stressful for the parents and other family members. Feelings of the parents may range from worried to frustrated, sad to angry, and even tired. Children may be able to sense these feelings in parents. Children may feel responsible for their parents’ reactions and for upsetting the household. It is important to take positive steps together as a team (parent and child) in getting through the problem of enuresis. Together parents and children should work on ways to diminish feelings of failure and look for ways to encourage good feelings.

Parental attitudes toward a child's bed-wetting can make the difference in how a child feels about their bed-wetting problem and him or herself. Support and praise will help a child. Shame and punishment will not.

Although experts disagree as to the cause of nocturnal enuresis (Miller; National Enuresis Society; cited in Du Mars, 1999, p. 211), medical theories, behavioral theories, and psychological theories are proposed. These theories range from genetic factors to biological factors, from premature toilet training to immature bladders, from sleep disorders to behavior problems, and from hormonal factors to stress factors.

A good first step in helping a child get through their bed-wetting is to finding out more about enuresis (bed-wetting). Although there are not any easy answers or quick fixes for the problem of bedwetting, there are ideas to help a parent and child cope with the problem until it is outgrown or overcome.

The first person to talk to about bed-wetting is the family physician. The child's physician can rule out any medical conditions that could be causing the child to wet his or her bed and can give advice or recommend a course of treatment. Bed-wetting won't be solved overnight. There are treatments available that will help the parent and child to cope with the problem until the child outgrows it, but it takes a patient, cooperative, and supportive team (parent and child) to work through this condition (Goodnites, n.d.).

Statement of the Problem

The purpose of this study was to determine the prevalence of bedwetting in children aged 6-10 years of age and to investigate parental knowledge and attitudes toward children who suffer from nocturnal enuresis. Research was conducted during the spring of 2002 by sending home a survey to randomly selected parents of Kindergarten, 1st Grade and 4th Grade students in a large school district in northwestern Wisconsin.

Research Questions

There are four research questions identified for this study.

1. Is nocturnal enuresis as prevalent as the literature states?
2. How do parents perceive enuresis in children five and ten years of age?
3. How knowledgeable are parents to the cause of nocturnal enuresis?
4. How often is treatment for nocturnal enuresis sought for the child?

Definition of Terms

For clarity, the following terms need to be defined.

Continence – the ability to control one’s bladder and bowel.

Enuresis – refers to the inability to control urination, especially involuntary bed-wetting.

Nocturnal enuresis – the emission of urine during one’s sleep.

Primary enuresis – never having established urinary continence.

Secondary enuresis - the development of enuresis after a period of established urinary continence, typically six months or longer.

CHAPTER II

Literature Review

Introduction

This chapter will define primary enuresis and secondary enuresis and briefly discuss the difference between the two. In addition, it will outline basic information such as signs and symptoms of nocturnal enuresis, causes of enuresis and treatment methods for enuresis. This chapter will conclude with general measures that parents can practice in order to preserve the sanity of the parent and the esteem of the child.

Finding out more about bed-wetting is a good first step in helping a child through this sometimes-traumatic experience. Though there are not any quick fixes to the problem of bed-wetting, there are ways in which the parent and child can cope until the problem of bed-wetting is outgrown. The first person to talk to about bed-wetting is the family physician. He/she can rule out any illnesses and determine if there are any physical reasons why the child may be wetting. In most cases, it is a stage of development the child will simply outgrow. Although this paper is an attempt to inform the reader of nocturnal enuresis and lists treatment methods and parent practices, it by no means should be a substitute for professional medical care. As stated earlier, a thorough examination of the child by the family physician should be done to rule out any medical issues.

Definition

As described earlier in chapter one, enuresis is involuntary urination during sleep that occurs more often than once a month in girls over five and in boys over six years of age. It is more common in boys than in girls. It is estimated that 15% to 20% of children wet the bed frequently enough to be considered enuretic (Husain & Cantwell; Walsh & Menvielle; cited in Fletcher, 2000). “Secondary nocturnal enuresis (SNE) is defined by the International

Children's Continenence Society as bedwetting that develops after a period of at least 6 months of consistent dryness" (Robson, 2000, p. 379). According to literature from Robson (p. 379), "secondary nocturnal enuresis accounts for about one quarter of patients with bed wetting."

It is estimated that "approximately 80% of clients diagnosed with enuresis have primary enuresis" (Doleys; Walsh & Menvielle; cited in Fletcher, 2000, p. 32).

Signs and Symptoms

Typically nighttime accidents should not be of concern in children under the age of 5 for females and 6 for males. "During the toilet training process, children will inevitably have 'accidents,' especially while they sleep" (Goin, 1998, p. 277). Research shows that one of the most common problems encountered by pediatricians is nocturnal enuresis in young children (Goin, 1998).

According to the American Psychiatric Association's Diagnostic and Statistical Manual of Mental Disorders, clinical enuresis is defined as the repeated voiding of urine into bed clothes - whether involuntary or intentional.

The behavior is clinically significant as manifested by either a frequency of twice a week for at least three consecutive months or the presence of clinically significant distress or impairment in social, academic (occupational), or other important areas of functioning. Chronological age is at least five years (or equivalent developmental level). The behavior is not due exclusively to the direct physiological effect of a substance (e.g. a diuretic) or a general medical condition (e.g. diabetes, spina bifida, a seizure disorder) (cited in Goin, 1998, p. 277-278).

"The DSM-IV standard clearly distinguishes five years as the time when normal continence is to be attained; and by that age, about 80% of children accomplish that goal" (Warzak, cited in Goin, 1998, p. 278).

As can be seen from the stated research, most children will have achieved normal continence by the age of five to six years. Bed-wetting at night is not considered significant until a child is older than six years of age and has either established dryness and is experiencing a relapse as in secondary nocturnal enuresis or has never established dryness such as in primary nocturnal enuresis.

Causes

In most cases the cause of bed-wetting is unknown. The following are the most common causes or popular theories. As stated earlier, an examination by a medical doctor should always be the first step in ruling out any underlying illnesses or conditions such as diabetes, urinary-tract infection, abnormalities in the urethral valve in boys or the ureter in girls or boys, and abnormalities in the spinal cord (Cendron, 1999).

Genetic Factors

A family history of nocturnal enuresis is found in most children with the condition. “The incidence of primary nocturnal enuresis is 77% among children who have both a mother and a father with a history of primary nocturnal enuresis. This rate decreases to 44% in children who have just one parent with a history of primary nocturnal enuresis and to 15% in children who have no parental history of primary nocturnal enuresis” (Gimpel & Warzak, 1998, p. 24). Twin studies lend support to the genetic-component theory. “Monozygotic (identical) twins consistently show much higher concordance for nocturnal enuresis than dizygotic (fraternal) twins” (Abe, Oda, Hatta; cited in Goin, 1998, p. 280). If a family history of nocturnal enuresis exists, it should be reported to the family physician. One should not ignore that maturational and developmental factors may also play a factor in nocturnal enuresis.

Biological Factors

“Some researchers propose biochemical deficiencies as possible causes of nocturnal incontinence” (Ritting, Lunsing; cited in Goin, 1998, p. 280). A decrease in the level of anti-diuretic hormone vasopressin was noted in enuretic subjects by researchers Ritting (1989) and Lunsing (1991). Each night the body secretes an anti-diuretic hormone that slows down the production of urine in the kidneys, thus decreasing the amount of urine in the bladder. Studies have demonstrated that children with enuresis did not show a normal rise in the nocturnal secretion of this anti-diuretic hormone. Normal increases in the secretion of anti-diuretic hormone are a typical response to extended periods of sleep. Some children with enuresis are in a stage where they produce too little of this hormone. “Abnormal secretion of anti-diuretic hormone at night may be a significant factor in the etiology of nocturnal enuresis in some children, although studies of gene markers do not correlate with abnormalities of anti-diuretic hormone function” (Eiberg, Berendt, & Mohr; cited in Cendron, 1999, p. 1208).

“Parents report that children who wet the bed usually do so early in the night” (Cendron, 1999, p.1207). The sleep patterns of enuretic patients have been studied extensively, but the resulting theories are very inconclusive. With all of the studies that have been done in this area no consistent correlation between abnormal sleep patterns and bed-wetting have been discovered. Studies have documented that patients with nocturnal enuresis have difficulties waking. Older studies suggest that bed-wetting occurs during slow-wave deep sleep; however, more recent studies suggest that bed-wetting may occur at different stages of the sleep cycle. It is noted in the DSM-IV that most voiding of urine takes place during the REM stage of sleep. Enuresis has been linked with the confusion between reality and fantasy (thinking one is awake when actually asleep), deep sleep or the inability to easily waken, and nightmares and recurrent dreams. However, these beliefs have been challenged.

For example, empirical research by Boyd (1966), as stated in Fletcher, referenced that there is no difference in the soundness of sleep between enuretic and non-enuretic children.

“Nocturnal enuresis has also been associated with upper airway obstruction in children, and surgical relief of the obstruction by tonsillectomy, adenoidectomy or both was reported to diminish nocturnal enuresis in up to 76 percent of patients” (Welder, Sateia, & West; cited in Cendron, 1999, p.1207). Limited research fully supporting this theory made validation of this hypothesis difficult.

Stress Factors

Although research is inconclusive, some researchers believe that familial and environmental stressors can trigger an enuretic episode. Goin (1998) cited a study, which found that “enuretic subjects were more likely to have parents who were divorced or separated than non-enuretic subjects. It is speculated that because many mothers are awarded custody of the children when marriages split-up, perhaps the separation from or absence of the father-figure takes more of a toll on little boys than on little girls, thereby accounting for their higher frequency of wetting behaviors (Goin, 1998, p. 281).

Environmental stressors, some of which are out of a person’s control, can also be anxiety producing. Major lifestyle disruptions viewed as stress can trigger an enuretic episode. Most of these episodes fall within the category of secondary enuresis, and a psychological cause can then be associated with the child’s enuresis.

Treatment Methods

Because the cause of enuresis is not always known, treatment for enuresis relies on a thorough assessment of the individual child. Children should be seen by a family physician to see if special testing is necessary. If the child has no medical or emotional problems, which is the case approximately 90% of the time, there is a very good chance that he/she will eventually outgrow the problem, even without treatment. If the bed-wetting child is older

than six or seven, the physician may suggest a few treatment options since bed-wetting may cause embarrassment. Traditional treatment of enuresis includes medication and behavioral therapy. There is not a “best” treatment per se for bed-wetting. Treatment should be designed around the needs of the child and the resources of the family.

Drug Therapy

Drug therapy remains, by far, the most ‘prescribed’ therapy for enuretic children. There are several prescription medications commonly suggested by medical professionals for children who are bed-wetters.

Imipramine (Tofranil), a tricyclic antidepressant, is typically the drug of choice by physicians. Imipramine was first used in the treatment of primary nocturnal enuresis in the 1960’s. Four hypotheses regarding its mechanisms of action have been established. They are “antidepressant effects, changes in sleep and arousal, anticholinergic effects, and stimulation of the antidiuretic hormone production” (Gimpel & Warzak, 1998, p. 25). The first three hypotheses have received little support in literature. While the last hypothesis is promising, further research is needed. Children treated with imipramine often continue the medication for three to six months; however, an optimal length of treatment has not yet been established. Relapse rate following discontinuation of this drug range from 60% to 95%. Recent review of the drug found that the longer a patient was on imipramine, the less likely he/she was to become dry, thus suggesting that prolonged use of the drug may not necessarily increase the therapeutic benefit or produce lasting results. Imipramine also has been found to have the greatest risk for adverse reactions. Although low doses of imipramine have relatively few serious side effects, adverse reactions have been documented. Most common of these adverse reactions are irritability, reduced appetite, dry mouth, headaches, and increased heart rate. Large overdoses of this drug can be fatal. It is vital that parents supervise the

administration of any medications so that accidental overdose does not occur (Gimpel and Warzak, 1998).

Desmopressin acetate (DDAVP) is another commonly used medication in the treatment of primary nocturnal enuresis. DDAVP acts as a synthetic anti-diuretic hormone. Desmopressin affects the kidneys by tricking them to increase water re-absorption in the collecting ducts, resulting in a lower volume of urine. DDAVP was originally formulated as a nasal spray, but a tablet form has recently been developed. DDAVP is successful in decreasing the number of wet nights that a child experiences, but dryness may not be maintained upon discontinuation of treatment. The percentage of relapse following termination is 50% to 95% (Gimpel and Warzak, 1998). DDAVP usage is recommended on a temporary basis when children wish to stay dry during overnight outings. In general, the side effects for DDAVP are mild, with nasal discomfort, headaches, and abdominal pain among the most common. DDAVP should be administered 30 to 60 minutes prior to bedtime, and fluid intake should be restricted on the evenings it is taken (Gimpel and Warzak, 1998). Seizures have been reported with the use of DDAVP, but it appeared that the patients in which this occurred had consumed excessive fluid, relative to the manufacture's instructions, which resulted in water intoxication and low serum sodium levels (Gimpel and Warzak, 1998). Because of the high rate of relapse and low success rates with most drug therapies, physicians may suggest behavioral therapy or combination therapy.

Behavioral Therapy

There are several behavioral therapies used to eliminate nocturnal enuresis, many of which incorporate classical and/or operant conditioning, and positive and/or negative reinforcement. Motivational therapy involves reassuring the parent and the child, removing the guilt associated with bed-wetting, and providing emotional support to the child. Emphasis should be placed on the child to take responsibility for his or her bed-wetting by

explaining to him/her the condition, reinforcing the fact that he/she did not cause the problem, and teaching him/her that he/she needs to take ownership in the treatment plan. One way to carry out motivational therapy is through positive reinforcement. This strategy is simply based on promoting desirable behavior through a reward system. This reward system should serve as a positive reinforcement to the child for achieving dry nights. The rewards can be anything from stickers to money to candy. If the child desires the reinforcer, it will be reinforcing. The use of sticker charts is an excellent tool when using motivation therapy as a treatment measure. The child can record and observe successes, and rewards can be connected to the desired behaviors. The success rate for children receiving motivational therapy has been estimated at 25% to 80%, with a relapse rate of approximately 5% (Cendron, 1999; Goin, 1998). “Motivational therapy appears to be a reasonable first line approach to treating children with primary nocturnal enuresis, especially younger children” (Cendron, 1999, p. 1210). Several procedures may enhance the effectiveness of treatment. Rewards for complying with procedures and for self-monitoring wet and dry nights should be included in the treatment of young children. Incentives for compliance may be more desirable than providing a reward for dry nights, because early successes may be too infrequent for a child to receive positive feedback. Parental support and negative patient perceptions of bed-wetting favor positive outcomes. In addition, children should participate in cleanup of bed linens and soiled laundry whenever possible. This should not be viewed as punitive, but as a consequence of the problem. This involvement may be viewed as undesirable by the child and, in turn, become a motivating factor in staying dry (Cendron, 1999).

A popular option of behavioral treatment is the use of the enuresis alarm. Various alarm devices are available, ranging in price, application, and construction. The enuresis alarm is a urine sensitive pad that can be put on the bed either under the child or inside the

child's pajama bottoms. The pad is wired to an alarm, which will either sound or vibrate, as soon as the pad becomes wet. As the child reacts to the alarm or vibrations, the muscles at the base of the bladder contract, which stops urination. The child should then be fully awakened and encouraged to continue elimination in the bathroom (Staff, 1995). The enuresis alarm is a successful behavior therapy method with a success rate ranging from 70% to 90% (Doleys, Lovibond, Lovibond & Coote, Sacks & DeLoen, Turner, Yates, as cited in Walker, Kenning, Faust- Campanile, 1989). The main disadvantage of the alarm is that it takes a great deal of patient effort and motivation. Children, for whom the alarm is effective, generally become dry within two to four months of correct use of the enuresis alarm (Staff, 1995).

Counseling

Sometimes individual or family counseling is the most appropriate and beneficial treatment for the child suffering from primary nocturnal enuresis, particularly when stress or anxiety appear to be the primary cause. From the counselor's perspective, bed-wetting is viewed as a symptom to an underlying problem. Counseling may not only help with the cessation of bed-wetting, but effective sessions can also play a role in improving or repairing family relationships.

Combination Treatments

Sometimes using a variety of treatment methods simultaneously is necessary to eliminate the bed-wetting behavior. Combination therapy is often more effective than single treatments, especially when previous individual treatments have not proven effective. Such combinations may include positive reinforcement and individual counseling, or positive reinforcement and the enuresis alarm.

Although the cause of primary nocturnal enuresis is not always known and discrepancies exist with regard to the effectiveness of treatment methods, parents and

physicians do have an array of therapies to choose from and information that enables them to identify children at risk of primary nocturnal enuresis.

As has been previously mentioned, nocturnal enuresis can take a toll on a child's self esteem. Bed-wetting may cause social and emotional problems for a child due to negative reactions from parents, siblings, and peers. The child's social life may be restricted. A child may be reluctant to sleep overnight anywhere other than his/her own familiar surroundings. Other symptoms may develop depending upon how family members react to the bed-wetting. "If parent's choose to use punishment, the problem of bed-wetting increases" (Gorin; cited in Du Mars, 1999, p. 212). "Parents who believe that a child's bed-wetting is a negative reflection on their parenting skills are most likely to use coercion or punishment to stop the behavior" (Warzak; cited in Du Mars, 1999, p. 112). Punishment can break down the parent-child relationship and intensify an already stressful situation. Children who are criticized, humiliated, or punished for their bed-wetting may develop a deep sense of shame, which can create a negative self-image. Because behavior is a reflection of self-image and self-esteem, a child with negative self-esteem may begin to display additional behavioral problems.

"It is important that parents have compassion and care when dealing with a bed-wetting child so as to avoid feelings of shame, which is the number one emotion associated with enuresis. Of all the negative emotions, shame is the most devastating for the child, as it often leads to the greatest number of disruptions in personality development. Such disruptions may reveal themselves in poor school performance, antisocial behavior, isolation, and depression" (Greet; cited in USA Today Magazine, 1997, p. 9).

Parents or caregivers should share with the child that nocturnal enuresis is a fairly common problem among children their age and help the child through the problem. Together parents and children should work on ways to diminish feelings of failure and to look for ways

to encourage good feelings. It is important to take positive steps together as a team (parent and child) in getting through the problem of enuresis. Parental attitudes toward a child's bed-wetting can make the difference in how a child feels about it and himself/herself. Support and praise will help a child. Shame and punishment will not. Talk with the child about what is happening to him/her. The adult could be the positive influence that he/she needs. Learning about the problem helps both the child and family to cope with their natural concerns.

CHAPTER III

Methodology

Introduction

This chapter includes information about how the sample was selected, a description of the sample, and the instrumentation used. In addition, data collection and data analysis procedures are given. The chapter concludes with the methodological limitations.

Selection and description of Sample

Parents of pupils of kindergarten, 1st grade, and 4th grade at a larger rural school district in northwestern Wisconsin were randomly selected to participate in this study. Guardians of both male and female students were asked to participate.

The sample selected represented children in the five to twelve-year-old age group. The reason for choosing this particular age group is that enuresis is prevalent in 7% to 20% of males and 3 % of females ranging from ages five to seven years. At age ten, the prevalence is 3% in males and 2% in females (American Psychiatric Association, 1994). Typically after the age of ten, children are beginning to outgrow bed-wetting.

Instrumentation

The questionnaire portion of this study was designed to be quick and easy to fill out by the participants. It included 17 items. An original questionnaire was designed for this study. The instrument was designed to determine if nocturnal enuresis is as prevalent as the literature states, to determine how parents perceive enuresis in children five to ten years of age, and to determine the parents' knowledge of the causes of nocturnal enuresis. The questionnaire was also a means to measure whether any treatments for enuresis were sought. Because it was constructed specifically for this study, there were no measures of validity or reliability for the instrument. A copy of the finalized questionnaire is located in Appendix B.

Data Collection

Permission was sought from the Superintendent of a large school system in northwestern Wisconsin. This occurred during the Spring Semester of 2002. Once permission was granted, the district office compiled a mailing list. The researcher selected participants using a systematic method of sampling. Questionnaire and consent forms were prepared for 300 pupils in the kindergarten, 1st, and 4th grade classes. A cover letter (Appendix A) accompanied each questionnaire and consent form, requesting the parent to fill out the questionnaire and informing him/her of the purpose of the study and intent of the researcher in using the information. Participation in the study was voluntary and the participants remained anonymous. Upon completion, participants mailed the questionnaire to the researcher in the pre-addressed stamped envelope provided to them.

Data Analysis

Frequency tables and descriptive statistics were analyzed using the SPSS for Windows © version 10 software program. Frequency rates were compared to available data on national averages and trends. Due to the descriptive nature of the data, significance tests were not computed for this study.

Assumptions and Limitations

It was assumed that an adult, such as a parent or guardian, responded to the questionnaire in a reliable manner. A limitation to this study was that the adult answering the questionnaire might not have a clear recollection of the child's earlier years. If the parent or guardian was unable to recollect earlier stages of the child's development the questionnaire may not have been answered in a credible and factual manner. Another limitation of the instrument is that it had no measures of validity or reliability. A third limitation is the fact that randomly selected participants were selected for this study; therefore, any results should be used cautiously.

CHAPTER IV

Results

Introduction

This chapter will present the results of this study. First, demographic information and item content of the instrument will be discussed. The chapter will conclude with the research objectives under investigation. Descriptive statistics will be presented to highlight the results found.

Demographic Information

The initial mailing of questionnaires included 300 households whom had a child between the ages of five and twelve years old. Of those initial 300, 114 responded to the questionnaire and returned it to the researcher; therefore, representing 38% of the total possible participants.

Of the 114 respondents, 54 (47.4%) were parents of male children and 60 (52.6%) were parents of female children. There were 5 (4.4%) five year olds, 31 (27.2 %) six year olds, 26 (22.8%) seven year olds, 6 (5.3%) eight year olds, 9 (7.9%) nine year olds, 27 (23.7%) ten year olds, 5 (4.4%) eleven year olds, 4 (3.5%) twelve year olds and 1(.9%) thirteen year old represented in the sample. According to the information submitted the mean age of toilet training was 29.649 months, with a mode of 30 or 2 ½ years of age. The mean age at the time of the survey was 7.9. Tables 1 through 3 describe the sample under investigation.

Item Analysis

Table 1

Gender of children in study sample.

		Frequency	Percent
Valid	Male	54	47.4
	Female	60	52.6
	Total	114	100.0

Table 2

Age of children represented in sample.

		Frequency	Percent
Valid	5.0	5	4.4
	6.0	31	27.2
	7.0	26	22.8
	8.0	6	5.3
	9.0	9	7.9
	10.0	27	23.7
	11.0	5	4.4
	12.0	4	3.5
	13.0	1	.9
	Total	114	100.0

Table 3

“At what age was your child toilet trained for wetting?”

	Frequency	Percent
18.0 months	15	13.2
24.0 months	26	22.8
30.0 months	34	29.8
36.0 months	25	21.9
39.0 months	1	.9
42.0 months	7	6.1
48.0 months	3	2.6
Total	111	97.4
not reported	3	2.6
Total	114	100.0

Item number 4 asked, “Does your child presently wet the bed?” Of the respondents 94, (82.5%) stated that their child did not presently wet the bed, while 20 (17.5%) were still

wetting the bed at the time of the questionnaire. Item number 5 asked, “Has your child previously wet the bed?” Forty (35.4%) responded that their child had a prior problem with bed-wetting.

Table 4

Frequency of present bedwetting.

	Frequency	Percent
None	94	82.5
Once in a great while	12	10.5
Monthly, on occasion	2	1.8
Weekly, on occasion	1	.9
Weekly, 2 to 4 times	2	1.8
Nightly	3	2.6
Total	114	100.0

Table 5

Percentage of previous bed-wetters.

	Frequency	Percent
Never	73	64.0
Yes	40	35.1
Total	113	99.1
Missing	1	.9
Total	114	100.0

If the respondent answered “never” to question #4 and “no” to question #5 they were asked to stop at this point and return the questionnaire. All other participants continued with the remaining items.

Item number 6 asked respondent’s to comment on frequency of previous bedwetting behaviors. Twenty (50%) of the respondents stated that their child struggled with bed wetting “once in a great while”, while the other 50% stated that their child dealt with bed wetting on a monthly, weekly and sometimes nightly basis.

Table 6

Frequency of previous bedwetting.

	Frequency	Valid Percent
Valid Once in a great while	20	50.0
Occasionally (one time monthly or less)	3	7.5
Occasionally (one time weekly or less)	6	15.0
Weekly (2 – 4 times)	6	15.0
Nightly	5	12.5
Total	40	100.0

Item number 7 asked, “If “yes” was the answer to question #5 (has your child previously wet), at what age did your child stop wetting the bed? 20 (51.3%) of the respondents stated that by 7 years of age their child had stopped wetting the bed. 7 (17.9%) respondents stated that by 11 years of age bed-wetting had ceased, and 12 (30.8%) stated that bed-wetting continued to be a problem for the child. The median at which the respondents had stopped wetting the bed was age 7.

Table 7

Age at which child ceased bed-wetting.

	Frequency	Percent
4	3	2.6
5	10	8.8
6	4	3.5
7	3	2.6
8	4	3.5
9	2	1.8
11	1	.9
Continues to wet	12	10.5
Total	39	34.2
Does not wet	75	65.8
Total	114	100.0

Item number 8 asked, “Please circle one. Would you consider your child’s bedwetting to be *primary enuresis* (child has never or seldom experienced a dry night) or *secondary enuresis* (child experienced dry nights and then began wetting)? Sixteen (51.6%)

felt that their child's bedwetting was primary enuresis, while 15 (48.4%) felt it was secondary enuresis.

Table 8

Type of enuresis.

	Frequency	Percent
Primary	16	51.6
Secondary	15	48.4
Total	31	100

Item number 9 asked respondents to, "Circle all that apply to the cause of your child's bedwetting." Of the respondents, 18(45%) did not know the cause of their child's bedwetting, 4 (10%) knew that it was a genetic factor, 1 (2.5%) felt that the bedwetting was a result of stress, 1 (2.5%) knew that it was a medical factor, 7 (17.5%) felt that their child was overtired, 8 (20.0%) felt that their child's bedwetting was a result from them being a sound sleeper, and 1 (2.5%) really did not know the cause but felt that their child was lazy.

Table 9

Cause of bed-wetting.

		Frequency	Percent
Valid	Genetic factors	4	10
	Stress factors	1	2.5
	Medical factors	1	2.5
	Unknown	18	45
	Overtired	7	17.5
	Sound Sleeper	8	20
	Laziness and unknown	1	2.5
	Total	40	100

Item number 10 asked, "Has your child been seen by a physician for their bedwetting?" Respondent's stated that 29 (70.7%) of their children had not been seen by a physician for their bedwetting behavior, while 12 (29.3%) had been seen by a physician.

Table 10

Had the child been seen by a physician for bedwetting?

		Frequency	Percent
Valid	No	29	70.7
	Yes	12	29.3
	Total	41	100

Item number 11 was removed from the analysis by the researcher due to the lack of response by participants. The item asked, “If you answered “yes” to question #10 (was your child seen by a physician for their bedwetting), was a medical diagnosis made?” Item number 12 better describes any diagnosis made by physician. Item number 12 asked, “Was a plan of action recommended?” 9 (47.4%) responded that no plan of action was recommended. “Letting it run its course”, 5 (26.3%), seemed to be the most prescribed action plan by physicians who saw children for their bedwetting behaviors.

Table 11

Physician recommendations.

		Frequency	Percent
Valid	None	9	47.3
	Medication	2	10.5
	Let it run its course	5	26.3
	Behavior Plan	1	5.3
	Bed alarm, let it run its course	1	5.3
	Medication, let it run its course, and behavior plan	1	5.3
	Total	19	100

Item 13 asked, “If you used the recommended plan, was it successful in helping the child to correct their bed-wetting behavior?” The majority of the respondents, 5 (55.6%) stated that the recommended plan was not helpful, 3 (33.3%) stated that the recommended plan was helpful, and 1(11.1%) did not use the recommended plan.

Item number 14 asked participants to state their “parental reaction when the child wet(s) his/her bed.” An understanding and supportive reaction, n = 19 (67.9%), was the response of the majority of the respondents.

Table 12

Parental response to bed-wetting behavior.

		Frequency	Percent
Valid	Disappointment and upset	4	14.3
	Child cleans up after self	1	3.6
	Understanding and supportive	19	67.9
	Concerned	1	3.6
	Frustrated	2	7
	Parent cleans child up	1	3.6
	Total	28	100

Item number 15 asked parents if they had spent any time researching the topic of bedwetting. The majority of the respondents, 27 (71.1%), stated that they had not researched the topic of bedwetting.

Table 13

Parental research of bedwetting literature.

		Frequency	Percent
Valid	No	27	71.1
	Yes	11	28.9
	Total	38	100

Item number 16 stated, “If you answered “yes” to question #15, did you find information to be helpful or appropriate to your child’s situation? Of the 11 respondents that had researched the topic of bedwetting, 6 (54.5%) found the information to be somewhat helpful, 3 (27.3%) found the information to be helpful, and 2 (18.2%) did not find the information helpful.

Item number 17 stated, “Do you feel that your child’s self esteem is affected by their bed-wetting?” Of the respondent’s, 19 (55.9%) did not feel that their child’s self-esteem was

affected by their bedwetting, 4 (11.8%) felt that their child was embarrassed and hesitant to spend the night away from home, the remainder of the respondents (32.3%) felt that their child was embarrassed, shy, emotional, and hesitant to spend the night away from home.

Table 14

Bed-wetting effects on child's self-esteem.

		Frequency	Percent
Valid	No effect	19	55.9
	Emotional	1	2.9
	Embarrassed	3	8.8
	Hesitant to spend the night away from home	2	5.9
	Emotional, embarrassed	1	2.9
	Shy, embarrassed	2	5.9
	Embarrassed, hesitant to spend the night away from home	4	11.9
	Emotional, shy, embarrassed		
	Shy, embarrassed, hesitant to spend the night away from home	1	2.9
	Total	34	100

Research Questions

Research question #1 posed the question, "Is nocturnal enuresis as prevalent as the literature states?" Item numbers 4, 5, 6 and 7 addressed this question. Research shows that an estimated 5 to 7 million children wake up in a wet bed due to primary nocturnal enuresis or nighttime bedwetting. The researcher found the prevalence of nocturnal enuresis among the respondents to be much higher in this study than in the literature review. Volunteer bias could be a contributing factor to these results. It was found that 46% of the male and 29% of the female respondents in the 5-7 year old age group experience nocturnal enuresis.

Research shows that nocturnal enuresis is prevalent in 7% to 20% of males and 3 % of females ranging from ages 5 to 7 years of age. The study found that 27% of the male and 17% of the female respondents in the 10-year-old age group showed bed-wetting behavior while the research shows that at age 10, the prevalence is 3% in males and 2% in females.

Table 15

Prevalence of bedwetting in 5-7 year old age group

Gender/Age	no	yes	Total	Percentage
Male 5	1	1	2	
6	8	4	12	
7	4	6	10	46%
Female 5	2	1	3	
6	12	7	19	
7	13	3	16	29%

Table 16

Prevalence of bedwetting in 10 year old age group

Gender/Age	no	yes	Total	Percentage
Male 10	11	4	15	27%
Female 10	10	2	12	17

Research question #2 posed, “How do parents perceive enuresis in children five and ten years of age?” Item number 14 addressed this question. It was found that parental reaction in regards to bedwetting behavior in the five year old was similar to the reaction to the ten year old. At both ages parents reacted with understanding and support. However once the child got beyond the age of ten the reactions of parents tended to be more negative.

Table 17

Parental reaction to bedwetting at age 5 and age 10.

Age	Reaction	Frequency	Percent per age
5	Understanding and supportive	1	20
10	Understanding and supportive	4	15
11	Understanding and supportive	2	40
	Disappointment and upset	1	20
12	Concerned	1	25
13	Disappointment and upset	1	100

Research question #3 was, “How knowledgeable are parents to the cause of nocturnal enuresis?” Items number 9, 15, and 16 addressed this question. The cause of their child’s enuresis was not known by 18 (45.0%) of the respondents, while 22 (55.0%) of the respondents gave a reason ranging from genetic, medical, or stress factors, to overtiredness, sound sleepers, or laziness. Twenty-nine percent of those responding in this area had spent time researching nocturnal enuresis.

Research question #4 – “How often is treatment for nocturnal enuresis sought for the child?” Item number 10 addressed this objective. It was determined that of the 40 children in the study who were considered to have nocturnal enuresis, only 12 (29.3%) had been seen by a physician for their bedwetting behavior.

CHAPTER V

Discussion, Conclusions, and Recommendations

Introduction

This chapter includes a discussion of the results of the study and conclusions. The chapter concludes with recommendations for further research.

Discussion

The findings from this study indicate that nocturnal enuresis among children in the 6-10 year old age group is as prevalent as the research indicates. As was stated previously, it is estimated that 15% to 20% of children wet the bed frequently enough to be considered enuretic (Husain & Cantwell; Walsh & Menvielle; cited in Fletcher, 2000). The results from the study participants indicated that 17.5% of the respondents presently dealt with bed-wetting behavior.

As was stated in the literature review, enuresis is prevalent in 7% to 20% of males and 3 % of females ranging from ages 5 to 7 years of age. At age 10, the prevalence is 3% in males and 2% in females ((American Psychiatric Association; cited in Fletcher, 2000, p. 33). Conclusions from the study indicate a higher percentage of bed-wetting males (46%) and females (29%) in the 5 to 7 year old age group. Although percentages did decline in the 10 year old age group with 27% of males and 17% of the females still bedwetting, these percentages did not match that of the literature which stated that at age 10, the prevalence is 3% in males and 2% in females. Discrepancy of these figures could be due to volunteer bias on the part of the participants and the lack of representation in this particular age group in the sample.

Nocturnal enuresis can take a toll on a child's self-esteem and is a frustrating problem to parents. The parent is typically the one responsible for the clean up after an accident and

is also typically charged with finding a cure for the problem (Goin, 1998). Feelings of the parents may range from worried to frustrated, sad to angry, and even tired. Children may be able to sense these feelings in parents. Study findings indicated that although some parents did feel frustrated, worried, upset and disappointed (24.9%), the majority of the parents (67.9%) reported that they are understanding and supportive of the child when bed-wetting occurs. Responses on the questionnaire indicated that 55.9% of the respondent's felt that bed-wetting had no effect on their child's self-esteem, while 44.1% felt that their child was emotional, shy, embarrassed and/or hesitant to spend the night away from home.

Strengths and Limitations of the Present Study

One strength of this research project was that the survey questionnaire (Appendix B) was comprehensive, yet manageable for parents to read and complete. The resulting data closely mirrored national statistics for the younger age groups, which suggests that the group that responded reasonably matches the national population. The response rate was quite good, given the nature of the questions being asked and the effort required to complete the survey.

Limitations of the study include volunteer, or response bias as a possible influence on the validity of the results. The near 50-50-gender match in responses, however, suggests that this may be negligible (it is assumed that more parents of males would have responded if volunteer bias were a concern). Prior to sending the surveys, the researcher had no information regarding the age and gender of the children in the homes. Only parent names were given. As such, there was no way to guarantee equal size, age and gender groups. Finally, the instrument was developed and administered by the researcher. As such, no psychometric data are available to assess its validity and reliability. However, due to the descriptive nature of the project, this concern is minor.

Recommendations for further study

If this study were to be replicated the following recommendations would be made:

1. Survey only guardians of 10-12 year old participants. By so doing the researcher would be able to get prior history as well as present history of the child's bed-wetting behaviors.
2. Although the sample was closely gender equitable it was by pure luck that this occurred. When sending out the questionnaires the researcher only had a mailing list of parent name(s) and addresses. It was unknown at the time of the mailing the gender of the child and the age of the child. This added a limitation to the study, and could have been detrimental to the results.
3. Keep the sample group large. In so doing the researcher will have a good representation of the population.

Conclusions

In conclusion, as can be seen by the literature review and study findings, nocturnal enuresis is prevalent among children 6-10 years of age. Parents should not become overwhelmed with feelings of frustration or failure due to their child's bed-wetting. Although it is prevalent, bed-wetting is seldom a topic of conversation among parents due to the private nature of the topic and perhaps to spare the feelings of the child. As stated earlier, this paper is an attempt to inform the reader of nocturnal enuresis and lists treatment methods and parent practices, it by no means should be a substitute for professional medical care. A thorough examination of the child by the family physician should be done to rule out any medical issues and if necessary professional counseling should be sought to help the child overcome their bed-wetting behavior.

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Why does my child wet the bed? (1999, March). *American Family Physician*, 59(5), 1219-1220.

Appendix A

Dear Parent(s),

I am a graduate student at the University of Wisconsin Stout in the Guidance and Counseling program. I am in the process of collecting information for my master's paper and I need your cooperation and effort. The subject of my study is Nocturnal Enuresis in Children (Bed-wetting). Your participation in this questionnaire is pertinent to my study whether your child has suffered from bed-wetting or not. Parents of children in Kindergarten, 1st and 4th grade have been chosen to voluntarily participate in this research effort.

Please complete the attached questionnaire and return it to me using the provided envelope by June 15, 2002. Information gathered will be anonymous and only used to compare research for my final paper.

Thank you for your consideration in participating in this research endeavor.

Sincerely,

Kim Sanborn

Human Research Consent Form

I understand that by returning this questionnaire, I am giving my consent as a participant volunteer in this study. I understand the basic nature of the study and agree that any potential risks are exceedingly small. I also understand the potential benefits that might be realized from the successful completion of this study. I am aware that the information is being sought in a specific manner so that no identifiers are needed and that confidentiality is guaranteed. I realize that I have the right to refuse to participate and that my right to withdraw from participation at any time during the study will be respected with no coercion or prejudice.

**Note: Questions or concerns about participation in the research or subsequent complaints should be addressed first to the researcher or research advisor and second to Sue Foxwell, UW-Stout Institutional Review Board for the Protection of Human Subjects in Research, 11 Harvey Hall, UW-Stout, Menomonie, WI 54751
Phone (715) 232-1126.**

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Appendix B

Questionnaire on Nocturnal Enuresis (Bed-wetting)

Please answer all questions by circling the most appropriate answer.

1. Circle the sex of your child: Male Female
2. Circle the age of your child: 5 6 7 8 9 10 11 12
3. At what age was your child toilet trained for wetting? 18 mos. 2 yrs. 2 1/2 yrs. 3 yrs. 3 1/2 yrs. 4 yrs.
4. Does your child presently wet the bed?
 - Never
 - Once in a great while
 - Monthly on Occasion
 - Weekly on Occasion
 - Weekly(2-4 times weekly)
 - Nightly
5. Has your child previously wet the bed? NO YES

If you answered “never” to question #4 and “no” to question #5, please stop here and return the questionnaire in the postage paid envelope provided. If you answered anything other than “never” or “no” please continue.

6. If “yes” was the answer to question #5 did he or she wet:
 - Once in a great while
 - Occasionally (one time monthly or less)
 - Occasionally (one time weekly or less)
 - Weekly (2-4 times weekly)
 - Nightly
7. If “yes” was the answer to question #5, at what age did your child stop wetting the bed:
 - 5 6 7 8 9 10 11 continues
8. Please circle one. Would you consider your child’s bedwetting to be *primary enuresis* (child has never or seldom experienced a dry night) or *secondary enuresis* (child experienced dry nights and then began wetting)?
9. Circle all that apply to the cause of your child’s bedwetting.
 - Genetic factors Stress factors Medical factors Laziness Unknown

10. Has your child been seen by a physician for their bedwetting? NO YES

11. If you answered "yes" to question #10, was a medical diagnosis made? NO YES (please explain)

12. Was a plan of action recommended? NO YES (circle those that apply)

Bed-alarm Counseling Medication Let it run its course Behavior Plan (please describe):

13. If you used the recommended plan, was it successful in helping the child to correct their bed-wetting behavior?

NO YES Did not use recommended plan

14. What is/was your parental reaction when the child wet(s) his/her bed?

15. Have you spent any time researching the topic of bed-wetting? NO YES

16. If you answered "yes" to question #15, did you find information to be helpful or appropriate to your child's situation?

NO YES SOMEWHAT

17. Do you feel that your child's self esteem is affected by their bed-wetting? NO YES (circle all that apply)

Emotional Shy Embarrassed Hesitant to spend the night away from home