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Parental beliefs about nocturnal enuresis causes, treatments, and the need to seek professional medical care

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Abstract *Objective:* To better understand parental beliefs regarding the etiology and treatment of nocturnal enuresis (NE).

Methods: A self-administered survey queried parental NE beliefs including perceived etiologies and home behavioral treatments. We assessed for associations between demographic characteristics and propensity to seek medical care for NE.

Results: Of 216 respondents, 78% were female. The most common causes for NE reported were: deep sleeper (56%), unknown (39%), and laziness (26%). Popular home behavioral therapies included: void prior to sleep (77%) and limiting fluid intake at night (71%). Few reported they would use a bedwetting alarm (6%). Fifty-five percent reported they would seek medical care for NE and 28% reported awareness of effective treatments. On multivariable analysis, females (OR 2.3, 95% CI 1.04–5.0) and those with graduate level education (OR 4.8, 95% CI 1.5–15.7) were more likely to seek medical care for their child with NE.

Conclusions: General parental knowledge of the causes and effective treatments for NE is lacking. Only 55% reported they would seek medical care for their child with NE and only 28% reported awareness of effective treatments. Counseling should focus on dispelling common misconceptions about causes and treatments of NE and focus on proven effective treatments.

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Introduction

Nocturnal enuresis (NE) is a common condition with up to 30–35% of children at age 5 having at least 1 episode per year and 10–15% having more than 5 episodes per year [1–3]. The prevalence of NE decreases steadily with age to where less than 1% of children at age 17 have more than 1 episode per year [1]. The causes of monosymptomatic NE

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are currently thought to be due to developmental delay of increased antidiuretic hormone production at night, developmental delay of appropriate arousal thresholds (*commonly referred to as "deep sleep" to the lay public*), and nocturnal detrusor overactivity [4–8]. Psychological or behavioral issues such as childhood defiance or laziness are not currently thought to be major causes [9].

At present, the suggested evaluation of nocturnal enuresis includes a general medical history and physical exam with a focused history regarding voiding habits to identify patients with medical conditions that may cause NE (e.g. diabetes) and patients with comorbid conditions that may affect treatment success (e.g. constipation and attention deficit hyperactivity disorder) [10]. A urine dipstick test is recommended to identify patients with diabetes [10].

Medications such as desmopressin and tricyclics have been demonstrated to be effective in reducing NE episodes in multiple randomized trials, but are associated with clinically significant relapse rates [11–13]. Behavioral treatments such as reward systems or waking the child to urinate during the night offer less certain benefits [14,15]. The bedwetting alarm results in dryness in around 2/3 of children and the effect is thought to be through a conditioning effect on sleep arousal [16,17]. Because the limited available evidence suggests that the bedwetting alarm may be more effective than medications with a lower long term relapse risk; it is considered by many to be first line therapy for NE [10,16].

Prior survey studies have evaluated parental beliefs and attitudes about nocturnal enuresis treatment and causes [18,19]. These studies were conducted in the 1970s and 1980s prior to the publication of most of the current randomized trial literature regarding NE treatments and pathophysiology. In addition, parents in the 1970s and 1980s did not have access to the internet, which has resulted in increased availability of medical knowledge to modern parents.

The purpose of this study is to evaluate current parental beliefs about the causes and treatments of NE by reporting results from a contemporary survey of parents whose children were seen at a tertiary referral center for pediatric urology. In addition, this survey also evaluated parental beliefs about whether a health care provider can offer help, and evaluated parental knowledge of effective treatments. This study also tested the hypothesis that parental demographic factors are associated with the decision to seek medical care for NE.

Methods

Population

The survey was taken by parents who had brought their children to our pediatric urology clinic with all diagnoses except NE. In order to test the hypothesis that parental demographic variables are associated with the decision to take children with nocturnal enuresis to a provider, parents of children being seen for NE were excluded.

Survey

The survey was an anonymous, self-administered survey available to be filled out by parents in the waiting room of

our pediatric urology clinic from September 2010 to June 2011 (Fig. 1). The surveys were left in the waiting area under an advertisement for the survey and parents gave the completed surveys to the staff. Approximately 1000 children had clinic visits during the time that the survey was available to be taken in the waiting room. The survey was provided in both English and Spanish. Participants were instructed that the survey was regarding their thoughts and beliefs about bedwetting. The survey was a total of three pages containing 20 questions. Parental demographics were obtained such as gender, age by decade, race, income range, education, number of children, and whether they had any children with a history of NE. The survey then asked participants what they thought were the major causes of NE. Participants were asked what treatments they would try if they had a child with nocturnal enuresis, including whether they would take their child to see a health care provider. Another question asked parents to give reasons for reporting they would not take their child to a health care provider. The final series of questions asked participants if they believed nocturnal enuresis should be evaluated by a health care provider, whether that health care provider could help, and whether they were aware of any effective treatments for nocturnal enuresis.

Statistical analysis

Descriptive statistics were used to present how the entire population answered the survey questions. Significant differences by chi-square test in survey responses based upon participants reporting they had a child with a history of NE are described. To test the hypothesis that parental demographics are associated with the decision to seek medical care, whether or not a participant chose "take my child to see a doctor/health care provider" when asked how would you treat your child's bedwetting was defined as the outcome of interest. Demographic variables in the analysis included: gender, age range by decade, income range (0-\$50,000, \$50,000-\$100,000, >\$100,000), highest education (high school or less, college, graduate school), and number of children (1, 2, 3 or more). The association between participant demographic variables and the decision to seek medical care was evaluated by univariable and multivariable logistic regression with the above variables being selected a priori for multivariable modeling. All analysis was 2-sided, and $p < 0.05$ was considered statistically significant. All statistical analysis performed with Stata version 12 (College Station, TX: StataCorp LP).

Results

Survey participants

Of the approximately 1000 clinic visits over 10 months, 216 people responded to the survey. The demographic makeup of the survey participants is shown in Table 1. The survey respondents were relatively well educated with high incomes. The population was predominantly female with a high percentage of Hispanic and Asian families.

Table 1 Survey participant characteristics.

	<i>n</i>	Percent
<i>Gender (N = 215)</i>		
Male	48	22%
Female	167	78%
<i>Education (N = 214)</i>		
High school or less	69	32%
College	102	48%
Graduate School	43	20%
<i>Race (N = 216)</i>		
White	109	50%
Hispanic	57	26%
Asian	32	15%
Black and other	18	8%
<i>Age range (years) (N = 215)</i>		
<20	16	7%
20–29	46	21%
30–39	84	39%
40–49	53	25%
50+	16	7%
<i>Household income (N = 208)</i>		
Less than \$50,000	84	40%
\$50,000–\$100,000	57	27%
>\$100,000	67	32%
<i>Number of children (N = 210)</i>		
1	54	26%
2	79	38%
3 or more	77	37%

Descriptive results

Table 2 reflects results to the question: What do you think is/are the major cause(s) of bedwetting in children over the age of 5 (choose all that apply)? Parents thought major causes of NE were deep sleeping (56%), laziness to wake up (26%), and small bladder (21%). Also, 39% of parents reported they did not know the cause of NE. Table 3 shows

Table 2 Parental beliefs about nocturnal enuresis causes.

What do you think is/are the major cause(s) of bedwetting in children? (Check all that apply)	Number who chose answer, <i>N</i> = 216 ^a
Child is a deep sleeper	121 (56%)
I don't know	84 (39%)
Laziness to wake up and go to the bathroom	57 (26%)
Child has a small bladder	45 (21%)
Bedwetting runs in the family	26 (12%)
Child defiant/behavioral problems	22 (10%)
Other	18 (8%)
Child is seeking attention	14 (6%)

^a Numbers of responses more than overall participants because they could select more than one answer.

the results to the question: If you had a child over the age of 5 who continued wetting the bed, how would you treat your child's bedwetting (choose all that apply)? A large percentage would have their child urinate prior to bed (77%) and limit fluid intake before bed (71%). Taking their child to see a health care provider was less popular at 55% and the bedwetting alarm or reprimanding were uncommon choices at 6% and 2% respectively. Among those who would not seek professional medical care, Table 4 illustrates the results to the question: If your child suffered from bedwetting, what would keep you from seeking professional medical care (choose all that apply)? There were three popular answers: "knowing that my child would eventually outgrow bedwetting" (47%), "I am not aware of good treatments" (33%), and "bedwetting is not a significant medical problem" (34%). Table 5 gives participant answers to questions regarding whether bedwetting should be seen by providers, can those providers help, and are they aware of any treatments. Similar numbers of participants were aware of effective treatments for NE (28%) and believed that NE in children can be treated effectively by a doctor or health care provider (27%).

Differences in survey responses between parents reporting having versus not having a child with a history NE

There were 33 (15%) participants who reported they had a child with a history of NE. A similar proportion (55%) of those participants reported they would take their child to see a health care provider for NE compared with the participants who reported they did not have a child with a history of NE (55%). However, there were some significant differences in other questions. Among NE causes; participants who reported they had a child with a history of NE were significantly more likely to choose "bedwetting runs in the family" (27% vs. 9%, $p = 0.003$). Among NE treatments; participants who reported they had a child with a history of NE were significantly more likely to choose "no treatment, let my child outgrow it" (33% vs. 10%, $p < 0.001$), and "bedwetting alarm" (18% vs. 4%, $p = 0.003$). Among reasons given for not seeking professional medical care; participants who reported they had a child with a history of NE were significantly more likely to choose "Knowing that my child would eventually outgrow bedwetting" (93% vs. 39%, $p < 0.001$). Among parents who reported having a child with a history of NE, 36% reported they were aware of effective treatments for NE compared with 27% ($p > 0.2$) among parents who did not report having a child with a history of NE.

Parent demographic variables associated with seeking medical care

Table 6 shows the results from the univariable and multivariable logistic regression for parent demographic variables associated with reporting seeking medical care as a treatment choice for NE. Multivariable analysis also adjusted for age range, income range, and number of children. Female gender and graduate level education were associated with an increased odds of participants reporting they would take their child to see a health care provider while Asian race was

Table 3 Parental beliefs about nocturnal enuresis treatments.

If you had a child over the age of 5 who continued wetting the bed, how would you treat your child's bedwetting? (Check all that apply)	Number who chose answer, N = 216 ^a
Have my child pee prior to going to sleep	166 (77%)
Limit my child's fluid intake before bedtime	154 (71%)
Take my child to see a doctor/health care provider	119 (55%)
Reward my child for dry nights	85 (39%)
Wake my child up at night and have them go to the restroom	70 (32%)
No treatment, let me child outgrow it	30 (14%)
Limit my child's caffeine intake	26 (12%)
Bedwetting alarm	14 (6%)
Other	10 (5%)
Reprimand/punish my child for wet nights	4 (2%)

^a Numbers of responses more than overall participants because they could select more than one answer.

associated with a decreased odds. On multivariable analysis; income range, age range, and number of children were not significantly associated with odds of participants reporting they would take their child to a health care provider. Adding an indicator variable for reporting that a child had a history of NE did not alter results.

Discussion

In our population, only 55% of parents reported they would seek medical care for a child with NE. Female gender and graduate level education were associated with significantly increased odds of reporting they would seek medical care and Asian race was associated with significantly decreased odds suggesting that parental demographics are associated with decisions to seek medical care for NE. A relatively high percentage (72%) of participants reported that they were not aware of effective treatments for NE and only 6% reported they would choose to use a bedwetting alarm as a treatment, suggesting that published studies demonstrating effectiveness of treatments such as the bedwetting alarm have not become general knowledge for modern parents [11,13,16].

Parents in our survey choose *reasonable* home behavioral treatments such as waking the child up at night,

reward systems, and fluid restriction that while not harmful; are known to be not as effective as the bedwetting alarm [15]. Prior studies have similarly evaluated parent treatment choices for NE. Haque et al., in 1981 reported that a majority of parents of children with NE would treat their child by waking them up at night (84%), restricting fluid (68%), or rewarding for dry nights (53%) which is similar to our survey results [18]. In addition, 48% of parents of children with NE took their child to a physician which is similar to the 55% of parents in our study who reported they would take their child to a health care provider [18]. In contrast to our study where only 2% of parents reported they would reprimand or punish their child with NE, 36% of parents from the 1981 survey reported they punished their child for wet nights [18]. This may represent a difference in parenting methods between the 1980s and present time versus differences in the understanding of effective interventions for NE. Also from 1981, Shelov et al. reported that large percentages of parents of children with and without NE reported they would treat their child by waking them up at night, restricting fluid, and rewarding for dry nights [19]. Only 30% of all participants reported they took their child to a doctor [19]. Similar to the other survey study from 1981, a higher percentage of parents (23%) reported they would punish their child for wet nights compared with our study [19].

Table 4 Reasons for parents not seeking medical care among those who did not report they would seek professional medical care.

If your child suffered from bedwetting, what would keep you from seeking professional medical care? (Chose all that apply)	Number who chose answer, N = 97 ^a
Knowing that my child would eventually outgrow bedwetting	46 (47%)
I am not aware of good treatments	32 (33%)
Bedwetting is not a significant medical problem	33 (34%)
Expense/costs	10 (10%)
Fear of invasive tests	9 (9%)
Other	3 (3%)
Parent or child embarrassment	2 (2%)
Treatments do not work well	1 (1%)
Language barrier	0 (0%)

^a Numbers of responses more than overall participants because they could select more than one answer.

Table 5 Parental beliefs about whether a provider can help with nocturnal enuresis.

Question	Number who chose yes, <i>N</i> = 216
Do you believe that bedwetting in children can be treated effectively by a doctor/health care provider?	58 (27%)
Do you believe that children with bedwetting should be evaluated by a doctor/health care provider?	120 (56%)
Are you aware that effective treatments are available for children with bedwetting?	60 (28%)

Regarding the cause of NE, significant percentages participants in the above studies believed that emotional problems (36% and 29%) and heavy sleeping (28% and 20%) were causes of nocturnal enuresis [18,19]. In our study; 56% thought that heavy sleeping was a major cause of NE and 42% thought that laziness, defiance, behavior problems, or attention seeking behaviors were major causes of NE. While statistical comparisons are not valid, these results suggest that perhaps there has been an increase in general knowledge about decreased arousal as a cause of NE while the percentage of parents who believe that NE is due to behavioral problems has not decreased. Behavioral issues such as laziness, defiance, and attention seeking are not currently considered to be major causes of NE [9].

Participants who reported they have a child with a history of NE were just as likely to report they would seek medical care as other parents. However, they were more likely to believe that bedwetting runs in the family and were more likely to report they would not treat the bedwetting and let their child outgrow it. These parents were more likely to choose the bedwetting alarm as a treatment even though it was still only a minority (18%). In addition, only 36% of these parents reported being aware of effective treatments for

NE. These results suggest that prior experience with NE does affect some parental beliefs about NE but a majority still report being unaware of effective treatments.

Results from this study suggest that parent demographics may affect whether or not children with nocturnal enuresis will be brought to a health care provider for evaluation and treatment. In addition, our survey suggests that counseling for NE should focus on dispelling prevalent inaccurate beliefs about NE causes and on education about proven effective treatments. Providers also should not assume that highly educated parents are more likely to be aware of proven treatments for nocturnal enuresis.

Study weaknesses

Weaknesses of our study include the highly select population of our pediatric urology clinic which limits the generalizability of our descriptive results. However, given the relatively high education level and socioeconomic status of our parents, one may suspect that our population would have a higher general knowledge about common childhood conditions and whether effective treatments exist and may be more likely to seek medical care. Approximately 20% of parents who attended the clinic while the survey was available participated by actively picking up a survey and filling it out. This low response rate could potentially lead to significant selection bias if parents who participated are significantly different than those who did not. While studies on response rates for our type of survey are not readily available; a review of over 50 trials on the effect of a monetary incentive on response rate of mailed surveys reported a pooled overall response rate of 21% for mailed surveys without a monetary incentive, which is consistent with our study [20]. Our study excluded parents of children who were being seen for nocturnal enuresis and those parents might have had different results on our survey because a parent may be more likely to research a condition if their child is being seen by a provider for that condition. Measures of association in cross sectional studies,

Table 6 Parents who would treat child over 5 years old with nocturnal enuresis by taking child to health care provider according to gender, education, and race.

	Treat by taking to physician, <i>n/N</i> ^a (%)	Univariable OR (95% CI)	<i>p</i> -Value	Multivariable ^b OR (95% CI)	<i>p</i> -Value
Gender					
Male	19/48 (40%)	[1]		[1]	
Female	100/167 (60%)	2.3 (1.2–4.4)	0.014	2.3 (1.04–5.0)	0.039
Education					
High school or less	36/69 (52%)	[1]		[1]	
College	49/102 (48%)	0.8 (0.5–1.6)	>0.5	1.1 (0.5–2.4)	>0.7
Graduate School	32/43 (74%)	2.7 (1.2–6.1)	0.021	4.8 (1.5–15.7)	0.009
Race					
White	68/109 (62%)	[1]		[1]	
Hispanic	34/57 (60%)	0.9 (0.5–1.7)	>0.7	1.2 (0.5–2.7)	>0.7
Asian	10/32 (31%)	0.3 (0.1–0.6)	0.003	0.3 (0.1–0.9)	0.025
Black or other	7/18 (40%)	0.4 (0.1–1.1)	0.067	0.5 (0.2–1.7)	>0.25

Abbreviations: CI, confidence interval; OR, odds ratio.

^a One person did not answer gender, 2 did not answer education, all answered race.

^b Also adjusted for income, age range, and number of children.

such as the OR used in our study, are also subject to bias if the difference in participation by predictors (demographics) is also related to the outcome (seeking medical care for NE). In our study, for example; women were more likely to participate than men. If this increased likelihood of participation was only among women who report they would seek medical care for NE, then the OR in that case would be biased towards showing women having increased odds of seeking medical care. In addition, our study was underpowered to detect all clinically important associations between parent demographics and whether parents report they would seek medical care for NE.

Conclusion

Even though nocturnal enuresis is a common childhood problem, general parental knowledge of accepted causes and effective treatments appears to be lacking. Around 50% of parents reported they would seek medical care for their child with nocturnal enuresis. Female gender and graduate level education were associated with increased reporting that they would seek medical care. Counseling of parents should focus on dispelling common misconceptions about nocturnal enuresis causes and treatments and focus on proven treatments such as the bedwetting alarm.

Conflict of interest

None.

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None.

Appendix A. Supplementary data

Supplementary data related to this article can be found at <http://dx.doi.org/10.1016/j.jpuro.2013.02.013>.

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