ORIGINAL ARTICLE

Frequency of Enuresis and the Factors Associated with it in School-going Children of Karachi, Pakistan

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ABSTRACT

Objective: This study was designed to spot the elegant of the frequency of enuresis and the factors associated with it in school going children Karachi, Pakistan.
Study Design: Cross sectional study.
Materials and Methods: Study Setting: Private and Public schools in the different areas of Karachi. School children from age 5 to 15 years. Calculated by using 9.1% prevalence with a maximum error of ±2% and a confidence interval of 99 %, the sample size was found out to be 1371.A total of 3000 questionnaires were distributed, of which only 1236 were returned. Thus, the response rate was 41.2%. Convenient sampling was adopted. Data for the study was collected from school children ages 5-15 years, interviewing their parents through a structured questionnaire regarding child's height and weight, parents education and occupation, monthly income, presence or absence of enuresis, duration, associated complications, family history management.
Results: The study showed frequency of enuresis 13.1%, in which males were 15.9%, while the females were 10.2%. The data collected from public (13.9%) and private (12.5%) sector. A significant relationship was found between the frequency of enuresis and the factors (i.e. age, gender, town, family history, co-morbidities, social behavior, BMI) after using x^2 test. The data was entered and analyzed on SPSS 16.0v.
Conclusion: This is a common disorder among school going children in Karachi and concern is present in parents and children both. The lack of knowledge and awareness is there, so that to educate the parent and children, awareness programs and campaigns should be organized.

Key words: frequency, enuresis, children, factor

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INTRODUCTION

Enuresis is a common problem in children and adolescents, and can lead to important social and psychological disturbances. This is used as medical term for wetting bed throughout the world by the kids and it is quite common[1].

Studies have shown that early expectation of parents from children to stay dry at night makes them concerned fairly quickly[2]. Mostly, boys and girls can stay dry by ages seven and six respectively[3]. Males are more frequent bedwetters (~60% overall whereas >90% nocturnal enuretics) than females. Whilst 95% of children are dry by the age of ten, rates of adult bedwetting range from 0.5% to 2.3%.

Owing to the fact that majority of children outgrow it, enuresis is often considered a self-limiting condition by doctors. Spontaneous care rate in children (5 – 9 years old) is 14% per year while in case of adolescents (10 – 18 years old), it is 16% per year. Beyong the age of 18 years (if still enuretic), people tend to confront this problem throughout their lives.

The most predominant type of bedwetting is Primary nocturnal enuresis (PNE) and the common causes are neurological-developmental delay ability

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to stay dry, and genetic susceptibility (chromosomes 13q and 12q)[4]. There is only a 15% chance that children will be enuretic whose parents were not, whereas it increases to 44% and 77% if one or both parents had the same problem[5].

Less common causes, though more strongly associated with secondary nocturnal enuresis (SNE), include but are not limited to infections (e.g., urinary tract infection)[6], physical abnormalities of the urinary tract (e.g., unusually smaller bladder)[3], insufficient anti-diuretic (ADH) production[7], psychological concerns (e.g., bullying, sexual abuse, etc.)[8], chronic constipation[9], attention deficit hyperactivity disorder (2.7 times more tendency toward bedwetting)[10], caffeine and alcohol consumption[10], mental retardation (bedwetting rate of 26.6%), and sleep apnea[11].

According to various studies, physical considerations of bedwetting are less important than its psychological effects. "It is often the child's and family member's reaction to bedwetting that determines whether it is a problem or not"[3]. Enhancement of self-esteem has been found to be related to managing the condition[12]. Enuretic children are vulnerable to bullying and/or admonishment from parents, thus subjecting them to behavioral disorders[8]. There is a growing evidence of a vicious cycle described by medical professionals, wherein punishment leads to shame and lack of confidence, which in turn leads to more enuretic episodes and hence more punishment.

Almost 25% of bedwetting children in USA are reprimanded[2],while in Hong Kong the percentage of such children who get punished is more than double (57%). The rate of punishment has been found to be inversely proportional to the level of parents' education[13]. According to a European study, parents with a nocturnal enuretic child will bear an additional annual expense of $1,000 for extra garments and laundry[14]. Notwithstanding these hard facts, physicians opine with emphasis that parents should be supportive and patient.

Being a very sensitive topic, the prevalence of enuresis in our community, is largely elusive. It is surprising that the study of this topic has only once been conducted in Pakistan, considering it has been carried out in majority of other countries notably USA, Malaysia, Iran, Turkey, Italy, Sweden and so on.

MATERIALS & METHODS

This is a school based cross-sectional study using convenient sampling technique. The research was conducted for the period of 12 months.

Using 9.1%[3] prevalence with a maximum error of ±2% and a confidence interval of 99 %, the sample size was found out to be 1371.

The different areas of three towns of Karachi having the mix (i.e. high, middle and low) socioeconomic status were targeted. Three thousand forms were equally distributed amongst the high, middle and low socioeconomic areas of Gulshan town, North Karachi town and Saddar town.

The targets of study were school going children (both boys and girls) between the ages of 5 to 15 years of various schools in Karachi. Therefore, different government and private schools which agreed to cooperate were included as a part of this study in each town.

A request letter seeking the permission to conduct this study was signed and stamped by the principals of these schools. The purpose of this study was explained to the teachers and students and the questionnaire containing information about the study was sent home for parents' consent if they want to participate in the study as the questionnaire to be filled by the parents. The returned questionnaires were considered as a written consent from the parents.

The questionnaire was designed in easy Urdu and English both so that it could be clearly understood by everyone. The questionnaire consisted of two parts. The first part contained questions regarding the sociodemographic status of students which included age, sex, birth weight, present height and weight, parent's education, occupation and income. The second part contained questions regarding enuresis and the attitude of parents towards it.

The height and weight of all those students who brought the questionnaires back was taken and recorded on it. An appreciation letter sent to parents who participated in study. This letter was having information about child weight, height, BMI, ideal parameters for the age of child and the basic knowledge about enuresis and its management.

Statistical Package for Social Sciences (SPSS version 16) was used for data entry and analysis of this research. Chi square and t-test were used to formulate the results.

The ethical approval for the study was obtained from The Ethical Review Board (ERB) of Dow University of Health Sciences (DUHS) Karachi.

RESULTS

Out of 3000 distributed questionnaires, 1236 were returned back that showed a response rate 41.2%. After that 45 were also excluded due to incomplete data so that the net response rate was 1193 (39.6%). A total of 1193 questionnaires were analyzed in which 598 were answered by parents of male subjects while 595 were answered by parents of females. A sum of 474 questionnaires were received from public while 719 were collected from private schools (Table 1)

Table 1: Frequency of enuresis with respect to the school category

School Type	Number of Responses	Enuresis Present (%)
Public	474	66 (13.9)
Private	719	90 (12.5)
Total	1193	156 (13.1)
Frequency of Enuresis by Gender		
Gender	Enuresis (%)	
Male	15.9	60.9
Female	10.3	39.1
Total Frequency	13.1	100
Enuresis Positive Subjects in Relation to Age Group		
Age Group (in years)	No. of Children (%)	
<=7	59 (38.0)	
8 to 10	67 (43.2)	
>=11	29 (18.7)	
Total	155 (13)	
Family History		
Relationship	Frequency (%)	
Father	15 (36.6)	
Mother	15 (38.5)	
Siblings	46 (38.3)	

However there was not much difference in the frequency of micturition in between public and private school children but there was great difference in between the residents of different towns and frequency of enuresis in children of Gulshan-e-Iqbal town was found to be less than half comparison to Saddar and North Karachi town.

The frequency of enuresis was found to be 15.9% in male students and 10.3% in female students. Hence 60.9% of enuresis positive subjects were males while 39.10% were females. The overall frequency turned out to be 13.1%. The majority of the enuresis positive participants were <=7 years of age. (Table1)

The majority of the subjects had bed wetting every night (25.9%) While the rates of positive family history in father mother and siblings were 36.6%, 38.5%, 38.3%. (Table 1)

The insignificant difference in the frequency of micturating children in relation to the education of parents was found, which shows lack of implementation of the knowledge on health education by the parents.

A significant number of enuresis positive subjects had painful micturation (14.4%), remained isolated (5.80%), were irritated (30.1%), felt shameful (34.0%) and had lack of confidence (14.7%). The frequency of UTI and constipation in enuresis positive subjects was 6.40% and 13.5% respectively. In addition 4.50% of the positive subjects had febrile fits (Table 2). While 11.8% had sleep disturbances (Table 3).

In the majority of parent's opinion, children should have control on enuresis by the ages 2 (26.2%) and 3 years (22.9%)

It was interesting to note that a significant number of parents (41.4%) punished their child in relation to this problem. However, 29.6% of the parents consulted a doctor for this problem, 28.1% gave medications and 69.2% believed that improvement was seen due to these medicines. (Table 3)

Bed wetting children are more likely to have behavioral problems when questioned about the different aspects of behaviour in enuretic children it was found that shamefulness is most common (34%). Next to this is irritation with a frequency of 30.1%. 14.7% children suffered from lack of confidence, 5.8% preferred to remain isolated while sadness was present in 4.5% of them.

Table 2: Frequency of Behavioral and Other Problems with Enuresis Positive and Enuresis Negative Subjects

Character	Enuresis Positive (%) N=156		Enuresis Negative (%) N=1037	
	Yes	No	Yes	No
Feels ashamed	53 (34)	103 (66)	12 (1.2)	1025 (98.8)
Lack of confidence	23 (14.7)	133 (85.3)	11 (1.1)	1026 (98.9)
Irritated	47 (30.1)	109 (69.9)	17 (1.6)	1020 (98.4)
Depressed	7 (4.5)	149 (95.5)	4 (0.4)	1033 (99.6)
Remains Isolated	9 (5.8)	147 (94.2)	6 (0.6)	1031 (99.4)
UTI	10 (6.4)	146 (93.6)	14 (1.4)	1023 (98.6)
Diabetes	01 (0.6)	155 (99.4)	1 (0.1)	1036 (99.9)
Constipation	21 (13.5)	135 (86.5)	71 (6.88)	996 (93.2)
Febrile Fits	7 (4.5)	149 (95.5)	12 (1.2)	1025 (98.8)

Table 3: Frequency of character and parents approach towards Enuresis

Character	Frequency (%)
Sleep disturbance	117 (11.8)
Painful Micturation	29 (14.4)
Wet Free period	137 (74.1)
Parents Opinion About Age at Which Bladder Control is Anticipated	
Age in years	Percentage
1	8.2
2	26.2
3	22.9
4	17.7
5	9.9
>5	14.2

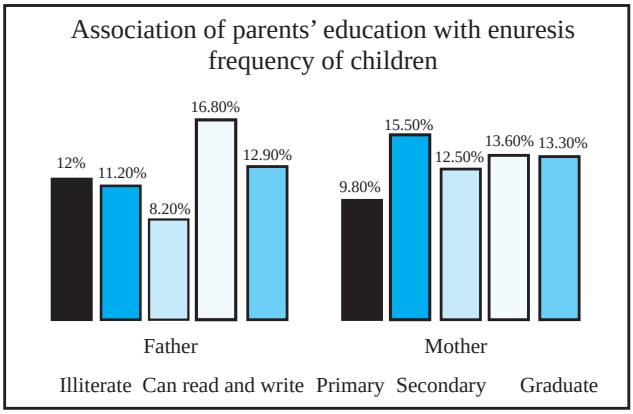

Fig. I: Association of parents' education with enuresis

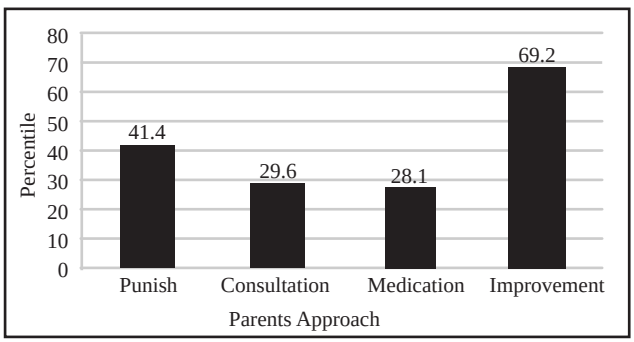

Fig. 2: Parents Approach Towards Enuresis

DISCUSSION

Although PNE is generally a benign symptom, it results in considerable distress to both parents and children. Enuresis in children can indicate underlying problem as a developmental delay or other serious etiologies, like urinary tract obstruction or psychiatric disturbances. Bedwetting may lead to parent's anxieties, guilt and eventually experiencing loss of confidence in their parenting skills. This results in difficulties in the relationships between parents and children [Morison et al BTU int 1998; 81:56]

The prevalence of enuresis varies with geographic area and study population. In our study, the frequency of nocturnal enuresis has been found to be 13.1%. This is higher than the frequencies found in previous studies conducted in Karachi[15], Iran[16], India[17], Turkey[18], Sweden[19], Italy[20] and Malaysia[21] which showed a prevalence of 9.1%, 7%, 7.61%, 12.4%, 12%, 5.17% and 8% respectively. While studies in some other countries like Qatar[22] and USA[2] showed a prevalence of greater than 13.1% i.e. 18.2% and 25% respectively.

Our study shows that nocturnal enuresis is more common in boys than girls as out of the total enuretic children 60.89% were boys and 39.10% were girls which is greater than the frequency found in the study previously conducted in Karachi which showed that 53.9% boys and 46% girls were enuretic. Similarly studies done internationally also showed the male gender to be more prone to this disorder[2].

In keeping with the proposed genetic basis of enuresis, many enuretic children did have a positive family history of enuresis. A positive family history in father, mother and siblings were seen in 36.6%, 38.5% and 38.3% of children with nocturnal enuresis respectively. This is in accordance to the previous study in Karachi which also showed 25.6% enuretic children with positive family history. The studies done in Iran and Turkey also agree with this[16,18].

Our study highlights a significant affect of socioeconomic status on frequency of enuresis being higher in lower and middle class populations as compared to high class. A similar influence of class was found in Turkey[18].

This study showed a greater number 29.6% parent consulted with a doctor than the last research conducted in Karachi which showed that 26.3% approached a doctor for this disorder.

Similarly, 15% and 26% of children visited a physician for the management of enuresis in Turkey and India respectively[17,18].

Our research also highlighted other associated problems with enuresis. Diabetes was more common in enuretic children with a frequency of 0.6% as compared to 0.1% in non-enuretics. 1.3% of enuretic children complained of kidney stones while only 0.5% of non-enuretics suffered from this problem.

One of the significant finding of our research was that UTI is 6.4% more frequent in enuretics than in non-enuretics which was 1.4%. Constipation was a positive finding in 13.5% of children who had enuresis and only 6.8% of non-enuretics had it.

There is a high frequency of febrile fits in children with enuresis (4.5%) as compared to non-enuretic children (1.2%).

Limitations: The three towns were covered due to the following reasons:

1) The mostly schools having mixed population with required socioeconomics condition are located in these towns.

2) The language bar was faced due to mixed population.

CONCLUSION

The positive enuretic cases were higher in male that show to be more common disorder in male especially with middle and low socioeconomic status, small age and a positive family history. Surprisingly, constipation appears to be a common problem among the enuretic children.

One of the significant findings of the research was that urinary tract infection (UTI) and febrile fits were also more common amongst the enuretic children, Furthermore behavioral problems were also noticed in bedwetting children that leads to shamefulness followed by irritation, lack of confidence, isolation and sadness

However the concern is present in both parents and children, as due to lack of knowledge about this disorder most of the parents punished their children for this problem. Thus, it was concluded that enuresis is a common disorder which can be easily treated by proper education and awareness campaigns.

There are several standard ways of helping your child learn to stay dry at night.

For instance: Family counselling , avoid expressing anger, frustration or hostility, Child should urinate before going to bed, Use plastic covers over the mattress instead of diapers, Standard home alarms should be used to train the child, Small rewards should be given for the dry nights, Teachers and parents should be educated through awareness programs in schools, Medications should be used under a physician's advice, Drugs which can be beneficial include desmopressin, tricyclic drugs, Associated morbidities should be addressed.

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