

Original Research Article

Frequency and Factors of Nocturnal Enuresis in Children from Age (6-12) Years Presenting to Tertiary Care Hospital of Abbottabad

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Name of Author:

Dr. Akhlaq Uddin¹, Dr. Muhammad Sajjad Sabir², Dr. Hasham Khan³, Dr. Muhammad Ihsan⁴, Dr. Adil Shah⁵, Dr. Sahibzada Aziz Ullah⁶

Affiliation:

¹⁻⁶Department of Pediatrics, Combined Military Hospital, Abbottabad, Pakistan

Corresponding Author:

Dr. Akhlaq Uddin
akhlaquddin.tmg@gmail.com

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Abstract:

Objective: To determine the frequency of nocturnal enuresis and its associated factors among children aged 6 to 12 years presenting to a tertiary care hospital of Abbottabad. **Study Design:** Descriptive cross-sectional study. **Place and Duration of Study:** This study was conducted from 15 May 2025 to 15 November 2025 at the Department of Pediatrics, Combined Military Hospital, Abbottabad. **Methodology:** A total of 151 children aged 6 to 12 years were included. Nocturnal enuresis was defined as involuntary urine passage during sleep at least two times per week for three consecutive months. Data were analyzed using Statistical Package for Social Sciences version 26. Mean and standard deviation were calculated for quantitative variables while frequencies and percentages were calculated for qualitative variables. Chi square test and Fisher exact test were applied after stratification, and p value ≤ 0.05 was taken as statistically significant. **Results:** The mean age of children was 8.72 ± 1.96 years. Nocturnal enuresis was found in 15 children giving a frequency of 9.90%. The most common associated factor was stubborn nature found in 60% followed by short duration breastfeeding and family history of nocturnal enuresis each present in 46.7% of affected children. Neonatal jaundice was observed in 20% and febrile convulsion in 6.7% of cases while urinary tract infection was not found. **Conclusion:** Nocturnal enuresis is a common problem in children, particularly in younger age groups and is mainly associated with behavioral and family-related factors.

Keywords: Breast Feeding; Child; Family History; Nocturnal Enuresis; Risk Factors

INTRODUCTION

Nocturnal enuresis is a typical condition in children that is characterized by involuntary urine passing during sleep that occurs many times in children when they are supposed to be able to control their bladder [1]. It tends to manifest itself beyond five years old and more frequently in males than in females [2]. The disorder can be primary, in which the child has never attained night dryness or secondary, in which there is a return to bedwetting following a phase of dryness [3]. Nocturnal enuresis has an impact on child self-esteem, academic performance and the stress among the family members and most parents believe that

this is a behavioral problem and not a medical one [4]. Its precise etiology is multifactorial and involves a delay in the maturity of the bladder and augmented night urine output and inability to be aroused by wakefulness [5]. The condition resorts in a majority of children with age, however, with the existence of other factors, others still display the symptoms in later childhood [6].

Nocturnal enuresis in children is linked to several medical factors. The urinary tract infection is a significant variable to consider, as it results in the irritation of the bladder and urinating frequently and can aggravate the bedwetting, particularly during the

night [7]. Some studies have also implicated neonatal jaundice, probably because the early maturation of the brain and bladder control, although the relationship is not always strong.⁸ History of febrile convulsion is another contributing factor implying the possibility of delayed neurological maturation that may affect bladder control in sleep [9]. These conditions do not necessarily result in nocturnal enuresis, but when they co-occur with other factors that contribute to increasing the risk or severity [10]. Nocturnal enuresis is also highly conditioned by behavioral and family factors. Those children who are said to have stubborn or difficult nature might not respond well to toilet training and parental instructions, causing them to continue wetting the bed [11]. In certain studies, the duration of breastfeeding is protective because longer breastfeeding correlates with improved neurological development and sleep behaviors whereas shorter duration correlates with a greater prevalence of enuresis [12]. The strongest factor is family history because children whose one parent or both parents have had a history of nocturnal enuresis have higher rates of developing the condition, which is a genetic predisposition [13]. In general, nocturnal enuresis is a complex disorder in which medical, behavioral and genetic factors interplay and affect the prevalence of the condition in children [14].

In a study by Pandey S, et al. has shown that frequency of nocturnal enuresis was 6.7% and urinary tract infection 8%, neonatal jaundice 14%, febrile convulsion 9.2%, stubborn nature 52.4%, short duration breastfeeding 49.7% and family history of nocturnal enuresis was 36.6% in children with nocturnal enuresis [15].

Local information on the occurrence of nocturnal enuresis in the children of Abbottabad is scarce and the available information is conducted on other areas. The factors of nocturnal enuresis might not be equal in this place, because of various living conditions, family habits and health care access. This research is required to determine frequency and frequent related factors such as urinary tract infection, neonatal problems and family history among children of Abbottabad. The findings will aid physicians and parents to have a deeper insight into the issue and enhance early treatment and guidance of children with the disorders.

METHODOLOGY

This cross-sectional study was carried out in the Department of Pediatrics Combined Military Hospital Abbottabad over a period from 15-05-2025 to 15-11-2025. Approval for the study was obtained from the institutional ethical review committee before initiation of data collection (No. CMH-Attd-ETH-194-Paed-24). The sample size was 151 children which was calculated using WHO sample size calculation software by keeping confidence level at 95%, margin

of error at 4% and expected prevalence of bedwetting as 6.7%.¹⁵ Children aged between 6 and 12 years of both male and female gender presenting for routine pediatric checkup were included in the study. Children having history of neurological disorders such as spina bifida, cerebral palsy or epilepsy, diabetes mellitus or diabetes insipidus, mental illness or mental retardation, obstructive sleep apnea, use of diuretics or previous renal surgery were excluded. Nocturnal enuresis was taken as repeated involuntary passage of urine during sleep occurring at least 2 times per week for a duration of 3 consecutive months as reported by parents or caregivers. Written informed consent was taken from parents or caregivers after explaining the purpose and benefits of the study before starting data collection.

General physical examination of each child was performed. For children identified with nocturnal enuresis, history regarding urinary tract infection, neonatal jaundice, febrile convulsion, stubborn nature, breastfeeding duration and family history of nocturnal enuresis was documented and relevant records or reports were reviewed where available. The frequency of nocturnal enuresis was noted among the studied children and associated factors were assessed in those diagnosed with nocturnal enuresis. Urinary tract infection was considered present when urine examination showed pyuria of ≥ 10 white blood cells/mm³ or ≥ 5 white blood cells per high power field along with positive urine culture showing single organism count of $\geq 5 \times 10^4$ CFU/mL. Neonatal jaundice was considered present when there was history of yellowish skin discoloration in neonatal period with serum bilirubin level >13 mg/dL. Febrile convulsion was taken as seizure episode associated with body temperature >100.4 °F where seizure involved loss of consciousness with bilateral limb movements lasting more than 1 minute. Stubborn nature was taken as persistent oppositional behavior reported by caregivers and observed during clinical interaction. Short duration breastfeeding was considered when exclusive or partial breastfeeding was continued for less than 12 months. Family history of nocturnal enuresis was considered positive if bedwetting beyond age of 5 years was present in at least one first degree relative.

Data were entered and analyzed using IBM SPSS version 26. Qualitative variables such as gender, socioeconomic status, education level, residential status, nocturnal enuresis and factors were expressed as frequencies and percentages. Quantitative variables including age, weight was expressed as mean $\pm$ standard deviation. Stratification was done for nocturnal enuresis with respect to age, weight, gender, socioeconomic status, education and residential status. Post stratification chi square test or Fisher exact test was applied and p value ≤ 0.05 was taken as statistically significant.

RESULTS

The study included total 151 children with mean age of 8.72 ± 1.96 years and mean weight of 21.09 ± 5.54 kg. Among the participants, males were 65 (43.0%) and females were 86 (57.0%). Regarding family socioeconomic status, poor families were 69 (45.7%), middle class families were 62 (41.1%), and rich families were 20 (13.2%). The parents educational level showed that uneducated parents were 52 (34.4%), primary education were 30 (19.9%), secondary education were 46 (30.5%), and higher education were 23 (15.2%). Most of children were from rural areas 93 (61.6%) while urban residents were 58 (38.4%) as shown in Table-1.

Table 1. Patient Demographics

Demographics	Mean $\pm$ SD / n (%)
Age (years)	8.72 ± 1.96
Weight (kg)	21.09 ± 5.54
Gender	
Male n (%)	65 (43.0%)
Female n (%)	86 (57.0%)
Family Socioeconomic Status	
Poor n (%)	69 (45.7%)
Middle n (%)	62 (41.1%)
Rich n (%)	20 (13.2%)
Parents Educational Level	
Uneducated n (%)	52 (34.4%)
Primary n (%)	30 (19.9%)
Secondary n (%)	46 (30.5%)
Higher n (%)	23 (15.2%)
Residential Status	
Rural n (%)	93 (61.6%)
Urban n (%)	58 (38.4%)

The frequency of nocturnal enuresis among children was found in 15 children (9.90%) while 136 children (90.10%) did not have nocturnal enuresis from total 151 children as shown in Table-2.

Table 2. Frequency of Nocturnal Enuresis in Children

Nocturnal Enuresis	Frequency	% age
Yes	15	9.90%
No	136	90.10%
Total	151	100%

Various factors were associated with nocturnal enuresis in affected children. Urinary tract infection was found in 0 children (0%), neonatal jaundice was present in 3 children (20%), febrile convulsion was observed in 1 child (6.7%), stubborn nature was most common factor found in 9 children (60%), short duration breastfeeding was present in 7 children (46.7%), and family history of nocturnal enuresis was also found in 7 children (46.7%) from total 15 children with nocturnal enuresis as shown in Table-3.

Table 3. Frequency of Factors Associated with Nocturnal Enuresis in Children

Factors	Frequency	% age
Urinary Tract Infection	0	0%
Neonatal Jaundice	3	20%
Febrile Convulsion	1	6.7%
Stubborn Nature	9	60%
Short Duration Breastfeeding	7	46.7%
Family History of Nocturnal Enuresis	7	46.7%
Total	15	100%

Children age ≤ 9 years had a significantly higher frequency of nocturnal enuresis (15.1%) compared with children > 9 years (1.7%) ($p=0.010$). Weight showed no significant association as enuresis occurred in 10.3% of children ≤ 15 kg and 9.8% of those > 15 kg ($p=1.000$). Similarly, gender was not significantly associated, enuresis was observed in 9.2% of males and 10.5% of females ($p=0.802$). Socioeconomic status also showed no significant relationship with prevalence of 13.0% in poor, 4.8% in middle-class, and 15.0% in rich families ($p=0.180$). Parents educational level was not significantly associated with nocturnal enuresis, with frequencies of 7.7% in uneducated, 10.0% in primary, 15.2% in

secondary, and 4.3% in higher education groups (p=0.485). Likewise, residential status showed no significant difference with enuresis reported in 9.7%

of rural and 10.3% of urban children (p=0.894) as shown in Table-4.

Table 4. Association of Nocturnal Enuresis with Demographic Factors

Demographic Factors		Nocturnal Enuresis		p-value
		Yes n(%)	No n(%)	
Age (years)	≤9	14 (15.1%)	79 (84.9%)	0.010*
	>9	1 (1.7%)	57 (98.3%)	
Weight (kg)	≤15	3 (10.3%)	26 (89.7%)	1.000*
	>15	12 (9.8%)	110 (90.2%)	
Gender	Male	6 (9.2%)	59 (90.8%)	0.802**
	Female	9 (10.5%)	77 (89.5%)	
Family Socioeconomic Status	Poor	9 (13.0%)	60 (87.0%)	0.180*
	Middle	3 (4.8%)	59 (95.2%)	
	Rich	3 (15.0%)	17 (85.0%)	
Parents Educational Level	Uneducated	4 (7.7%)	48 (92.3%)	0.485*
	Primary	3 (10.0%)	27 (90.0%)	
	Secondary	7 (15.2%)	39 (84.8%)	
	Higher	1 (4.3%)	22 (95.7%)	
Residential Status	Rural	9 (9.7%)	84 (90.3%)	0.894**
	Urban	6 (10.3%)	52 (89.7%)	

*Fischer Exact Test, **Chi-Square Test

DISCUSSION

In present study the overall frequency of nocturnal enuresis was found 9.90% (n=15) in study population. This frequency is considerable and indicate that nocturnal enuresis remains significant clinical problem in pediatric population. The possible explanation for this frequency could be related to delayed maturation of bladder control mechanisms and inadequate secretion of antidiuretic hormone during nighttime which result in excessive urine production. The most common factor associated with

nocturnal enuresis was stubborn nature which was present in 60% (n=9) of affected children. This finding suggest that behavioral and psychological factors play important role in nocturnal enuresis. Children with stubborn nature may resist toilet training or may not respond properly to bladder signals during sleep due to their behavioral characteristics. Short duration breastfeeding and family history of nocturnal enuresis were both found in 46.7% (n=7) of cases. The association with short breastfeeding duration could be explained by lack of immune factors and nutritional benefits that breast milk provide for proper urological system

development.

The frequency of nocturnal enuresis in present study was 9.90% (n=15) which is comparable with findings of Alrashed Kh M et al. 16 who reported 8.8% frequency in Jordanian children and Yazici CM et al. 17 who found 7.5% prevalence in Turkish schoolchildren. This similarity could be attributed to similar age groups and comparable socioeconomic conditions in these populations. However, current study frequency is lower than reported by Alqahtani YA et al. 18 who found 31.1% prevalence in Saudi Arabia, Şahin AH et al. 19 who reported 18% in Turkey, Zahid M et al. 20 who found 13.9% in Karachi, Tajuddin M et al. 21 who reported 13.1% in Karachi, Shah S et al. 22 who found 43% in Karachi, and Chatta MN et al. 23 who reported highest frequency of 25% in rural Sialkot. These differences may be explained by variations in study populations, different age ranges included, geographical locations, cultural practices regarding toilet training, and socioeconomic disparities. The higher frequencies in other studies particularly in rural areas suggest that poor living conditions, lack of awareness, and inadequate healthcare facilities contribute to increased prevalence.

The present study found family history of nocturnal enuresis in 46.7% (n=7) of affected children which is consistent with findings of Yazici CM et al. 17 who reported 54.6% family history, Şahin AH et al. 19 who found positive family history as significant factor with odds ratio of 2.51, and Demirci A et al. 24 who reported that risk of enuresis was 5.5 times higher in children whose parents had enuresis. This similarity confirm the strong genetic predisposition in nocturnal enuresis as hereditary factors affect bladder control mechanisms and antidiuretic hormone secretion patterns which are transmitted through generations.

The association of stubborn nature with nocturnal enuresis found in 60% (n=9) of cases in present study align with behavioral and psychological factors reported by Alqahtani YA et al. 18 who identified attention-deficit hyperactivity disorder, dark phobia, and exposure to bullying as risk factors, and Demirci A et al. 24 who found relationship between enuresis and anxiety and depression. These findings suggest that behavioral characteristics and psychological stressors play significant role in development and persistence of nocturnal enuresis.

The present study showed significant association between younger age ≤ 9 years and nocturnal enuresis ($p=0.010$) with frequency of 15.1% (n=14) compared to 1.7% (n=1) in older children which is similar to findings of Yazici CM et al. 17 and Chatta MN et al. 23 who reported that nocturnal enuresis decrease with increasing age. This is because neurological maturation and bladder control mechanisms develop progressively with age and most children achieve complete continence as they

grow older.

Gender distribution in present study showed no significant difference with males 9.2% (n=6) and females 10.5% (n=9) having nocturnal enuresis ($p=0.802$) which contradict findings of Alrashed Kh M et al. 16 who found male predominance with 61.3%, Yazici CM et al. 17 who reported higher prevalence in boys 8.7% compared to girls 6.1%, and Tajuddin M et al. 21 who found males more affected with 15.9% than females 10.3%. This difference could be due to small sample size in present study or variations in cultural and behavioral factors affecting gender-specific reporting of enuresis.

Limitations

There are a few limitations associated with the present studies. The first one is that it was a single center study carried out in a single hospital, and it might not generalize the results to the rest of the population. The sample size was not very large and only 151 children were involved in the sample that can influence the statistical power of study and the possibility of significant associations. The study is cross-sectional; it does not allow causation of any relationship between determined factors and nocturnal enuresis.

CONCLUSION

The current research has concluded that nocturnal enuresis is typical clinical issue among children in the study group. It was also found that the incidence of nocturnal enuresis was high and multiple factors were linked with this condition. The most prevalent factors were found to be the stubborn nature and the short duration of breastfeeding followed by family history of nocturnal enuresis.

Disclaimer:

No disclaimer is provided.

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Ethical Approval:

This study was approved by the Ethical Committee. All works was carried out by following committee rules and also according to Helsinki Declaration.

Patients' Consent:

Before joining the study all patient signed written consent. They were informed that their data will be kept confidential and they are free to withdraw from the study at any time.

Conflict of Interest:

The author declares that there is no any conflict of interest related to this research.

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