

Prevalence of Diurnal Enuresis in Children Aged 5-12 Years in Al-Diwaniyah, Iraq

Ahmed Ali Obaid¹, Ahmed Abdul Ameer Alwan¹ and Shiren Ali Al-Hamzawi²

ABSTRACT

Objective: To assess the prevalence of diurnal enuresis among children aged 5-12 years in Al-Diwaniyah.

Study Design: Cross sectional study

Place and Duration of Study: This study was conducted at the Al-Diwaniyah Teaching Hospital and Al-Diwaniyah Maternity and Pediatrics Hospital, in central part of Iraq from 1st January 2024 to 1st July 2025.

Methods: 200 children of the age 5-12 years were enrolled. Seven cases were excluded due to other medical causes. The children have been interviewed, and the children have been assessed clinically. Urine test and lumbosacral X-ray were done.

Results: Twelve (6%) children were diagnosed with diurnal enuresis. The highest prevalence was at the age group of 5-8 years 75% with a steady decline by the age of 12 (8%). Males were more frequently affected 66.7% and females represent 33.3% of the cases. Primary diurnal enuresis accounted for 75% of the cases, while secondary diurnal enuresis was 25%.

Conclusion: A minority of school-aged children in Al-Diwaniyah were affected, especially younger boys. The commonest type of diurnal enuresis was the primary one.

Keywords: Diurnal enuresis, Prevalence, Children, Urinary tract infection

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INTRODUCTION

Diurnal enuresis (DE) is a substantial but under recognized condition in childhood, specifically in the developing countries. Mastering control of bladder and bowel is a complex and gradual process that occurs over a period of months for the typical toddler. Infants in general void small amounts of urine every hour and this is commonly stimulated by the process of feeding to diagnose a case of diurnal enuresis the child must show a chronological or developmental age of at least 5 years. The diagnosis of enuresis is done only after the exclusion of medical conditions. Infants void frequently, but as bladder capacity increases during toddler years, cortical inhibitory pathways mature and voluntary control emerges. Normally, sequence of the control over bladder and bowel function is nocturnal bowel control, diurnal bowel control, diurnal bladder control, and nocturnal bladder control.

¹. Department of Surgery / Gynecology and Obstetrics², College of Medicine, University of Al-Qadisiyah, Iraq.

Correspondence: Ahmed Ali Obaid, Department of Surgery, College of Medicine, University of Al-Qadisiyah, Iraq.
Email: ahmed.a.obaid@qu.edu.iq

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The developmental route of toilet training is affected by a variety of factors among them are intellectual ability, neurological growth, social maturity, cultural practices, and parents-children psychological interaction. Diurnal enuresis is described as involuntary urination during waking hours beyond the usual age of bladder control.¹ Generally the clinical criteria require a minimum of two wetting periods per week for three months or more in the absence of underlying medical disorders.² Compared with nocturnal enuresis, DE has received less attention in research, despite being linked to delayed bladder maturation, psychosocial stresses, urinary tract infections, and behavioral comorbidities. The prevalence of diurnal enuresis decreases with the increase of age. The previous international studies accounted a prevalence ranging from 2 percent to 5 percent among the age of school children, with higher percentage was in younger children and in the developing countries.³⁻⁵ The purpose of the present study was to address the prevalence of diurnal enuresis in children who live in Al-Diwaniyah, Iraq.

METHODS

This cross-sectional study was conducted at Al-Diwaniyah Teaching Hospital and Al-Diwaniyah Maternity and Pediatrics Hospital, Iraq from 15th September 2024 to 15th March 2025 letter No. 3434/QM/Approval/JSDJNEHU dated September 7, 2024. The study was using convenience sampling of those children who were attending outpatient

department in two main hospitals: Two hundred children between the age of 5-12 years were enrolled. Children with known neurological disorders, congenital urinary tract anomalies, or urinary tract infection confirmed by laboratory investigations were excluded. Data were obtained through structured parents' interview. Clinical examination, Laboratory urine analysis, and lumbosacral X-ray were done. Prevalence was analyzed according to age, sex, and diurnal enuresis subtypes (primary vs. secondary). The analyses of data were done by the use of Statistical Package for the Social Sciences 27.0. Descriptive statistics were used as percentages and frequencies and for assessing the association between diurnal enuresis and sex, Chi-square (χ^2) test was used. A p-value of <0.05 was of statistical significance.

RESULTS

There were 120 (60%) males and 80 (40%) females. Diurnal enuresis was observed in 12 cases, giving prevalence of 6%. The results of this study revealed that affected males were outnumbering females, 8 out of 120 (6.7%) for males and 4 out of 80 (5%) for female but the difference was not of statistical significance ($\chi^2 = 0.23$, $p = 0.62$) [Table 1].

The predominant subtype was primary diurnal enuresis constituting 9 (75%) cases, while secondary diurnal enuresis was found in 3 (25%) cases (Table 2).

The distribution of diurnal enuresis cases was clearly concentrated in the age group of 5-8 years and constitutes (75%) of the study sample while there is a decline in the occurrence of diurnal enuresis with the increase of age (Table 3)

Table No. 1: Prevalence of diurnal enuresis according to sex

Gender	No.	Cases of diurnal enuresis	Prevalence
Males	120	8	6.7%
Females	80	4	5.0
Total	200	12	6.0

$\chi^2 = 0.23$, $p = 0.62$

Table No. 2: Subtypes of diurnal enuresis

Subtype	Cases	Percent
Primary diurnal enuresis	9	75.0
Secondary diurnal enuresis	3	25.0
Total	12	100.0

Table No. 3: Distribution of diurnal enuresis according to the age group

Age (years)	No.	%
5-8	9	75.0
9-11	2	16.7
12	1	8.3
Total	12	100.0

DISCUSSION

The present study identified a prevalence of diurnal enuresis among the age of school children in Al-Diwaniyah. This percentage of diurnal enuresis is consistent with other Iraqi research that generally reported prevalence ranging between 4% and 7%.⁶⁻¹⁰ However, in comparison with other international studies this figure is lower than that reported 8%-10% by them.¹¹⁻¹³ This discrepancy may be ascribed underreporting of diurnal enuresis because of being socially stigmatized or due to the differences in the study.

The higher prevalence in 5-year-olds reflects incomplete bladder maturation, which improves progressively with age while the decline in prevalence with the increase of age supports the concept that diurnal enuresis considerably resolves as the capacity of the bladder improves.⁸

Within the context of the region many behavioral and environmental factors may have a contribution to diurnal enuresis persistence. These factors are cultural expectations in practicing toilet training, limited access to school toilet, which may discourage urination regularly, long class hours with limitation of bath breaks. In addition to that the province's climate which is characterized by being hot probably affects hydration of children and voiding manner. These factors with the psychosocial and other stressors such as academic pressure, overcrowding, parental awareness patterns may give a possible explanation for the prevalence and decline in diurnal enuresis with age development.^{5,7}

In this study boys were slightly higher than girls were and this is in alignment with findings from other studies^{13,14}, despite the fact that the difference was not statistically significant. The most suitable explanations are the slower urogenital maturation in boys and the differences in report that is given by the parents. All cases of diurnal enuresis attributed to neurological disorders, congenital urinary tract abnormalities, urinary tract infections or other organic causes, were excluded to secure that the study is focusing on the functional nature of diurnal enuresis. In general the predominance of primary diurnal enuresis compared to secondary diurnal enuresis reflects the trend that is reported in both Iraqi and international literature. Secondary diurnal enuresis is more commonly linked with other medical conditions, psychological stressors and traumas, emotional distress and behavioral disturbances as it is stated in previous literatures.^{11,12,15}

Limitations of the study: On interpretation of the results of this study, several limitations should be taken in consideration: First, the study was a hospital-based convenience sampling method and this limits the generalization of results to the broader group of

children in Al-Diwaniyah. Second, the number of those diagnosed with diurnal enuresis is so small and this may reduce the ability to detect significant associations of the variables (e.g. age and sex). Third parent's reports through interviews may lead to recall bias particularly for stigmatizing conditions as diurnal enuresis.

CONCLUSION

Diurnal enuresis affects a minority of children aged between 5–12 years in Al-Diwaniyah and the highest prevalence was among younger age group. Primary diurnal enuresis is more prevalent than secondary one though statistically not significant and males are outnumbering females. Early identification and recognition with the education of parents are of paramount importance, particularly at the age of school entrance.

Recommendations

1. Children under the age of eight years are routinely screened for enuresis.
2. Comprehensive psychological and medical assessment for children with secondary diurnal enuresis.
3. Education of parents about normal bladder development and early intervention.
4. Further studies in Iraq are required to provide further epidemiological data about diurnal enuresis.

Author's Contribution:

Concept & Design or acquisition of analysis or interpretation of data:	Ahmed Ali Obaid, Ahmed Abdul Ameer Alwan
Drafting or Revising Critically:	Ahmed Ali Obaid, Shiren Ali Al-Hamzawi
Final Approval of version:	All the above authors
Agreement to accountable for all aspects of work:	All the above authors

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REFERENCES

1. Mikkelsen EJ. Elimination disorders. In: Sadock BJ, Sadock VA, editors. Kaplan & Sadock's Comprehensive Textbook of Psychiatry. 8th ed. Vol. 2. Baltimore: Lippincott Williams & Wilkins; 2005.p.3237.
2. American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders (DSM-5). Washington, DC: APA; 2013.p.39-43.
3. Wagner C, et al. Characteristics of urinary incontinence in 6-10-year-olds. *Eur J Pediatr* 2008;167(10):1057-62.
4. Joinson C, Grzeda MT, von Gontard A, Heron J. A prospective cohort study of biopsychosocial factors associated with childhood urinary incontinence. *Eur Child Adolesc Psychiatr* 2019; 28(1):123-30.
5. Al-Asadi JN, Radhi AM, Jumaa DS, Hassan MK. The role of hyposthenuria in enuresis among paediatric patients with sickle cell disease. *Sultan Qaboos Univ Med J* 2023; 23(2):206-11.
6. Abdul-Kareem AA. Prevalence of enuresis in a sample of Iraqi children in Tikrit and Beji. *Tikrit J Pure Sci* 2009;14(3):152-6.
7. Al-Saad R, Al-Hadithi T. Epidemiology of enuresis among schoolchildren in Diyala Governorate. *Iraqi J Community Med* 2006; 19(2):129-33.
8. Al-Sharbatti S, Al-Ward N. Enuresis: prevalence and associated factors among primary school children in Baghdad. *East Mediterr Health J* 2005;11(5-6):944-54.
9. Mohammed F, Mahmood K. Prevalence and risk factors of nocturnal and diurnal enuresis among primary school children in Mosul. *Ann Coll Med Mosul* 2010;36(1):44-50.
10. Ahmed S, Hassan Z. Assessment of enuresis among children attending Rapareen Pediatric Teaching Hospital in Erbil city. *Kufa J Nurs Sci* 2014;4(2):1-12.
11. Butler RJ, Heron J. The prevalence of daytime wetting among children aged 4–9 years. *J Urol* 2008;179(6):2362-8.
12. Caldwell PH, Deshpande AV, Von Gontard A. Management of daytime urinary incontinence and enuresis in children. *Lancet Child Adolesc Health* 2018;2(5):398-407.
13. Austin PF, Bauer SB, Bower W, Chase J, Franco I, Hoebeke P, et al. The standardization of terminology of lower urinary tract function in children and adolescents: Update report from the standardization committee of the International Children's Continence Society. *Neurourol Urodyn* 2016;35(4):471-81.
14. Joinson C, Heron J, von Gontard A. Psychological problems in children with daytime wetting. *J Child Psychol Psychiatry* 2007; 48(11):1099-1108.
15. Joinson C, Heron J, Emond A, Butler R. Psychological problems in children with bedwetting and combined (day and night) wetting: A UK population-based study. *J Pediatr Psychol* 2007; 32(5):605-16.