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Prevalence of nocturnal enuresis and its influence on quality of life in school-aged children

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Summary

Objective
According to the ICCS definitions, enuresis is defined by an intermittent, wetting during sleep after organic causes have been ruled out with a minimum wetting frequency of once per month. Previous studies reported a prevalence rate of 9–12%. Eighty to 90% of enuresis cases are identified as primary enuresis and are based on genetic predisposition, biological and developmental factors. On the other hand, secondary enuresis frequently arises from psychological factors. In this study we aimed to determine the prevalence and associated factors of nocturnal enuresis (NE) among primary school children.

Method
We initiated a prospective cross-sectional epidemiological study from January 2013 to May 2013 by sending a questionnaire to parents of 4250 school children, aged 6–13 years. The questionnaire consisted of three parts. The first part investigated the demographic characteristics of the child and family, such as age, gender, number of siblings, and enuresis history of the parents and siblings. The second part consisted of questions about the presence and frequency of bedwetting, presence of constipation/fecal incontinence, and presence of daytime incontinence (DI). The last part surveyed school performance and the effect of enuresis on quality of life of parents and children. Logistic regression analyses were conducted to determine the significant predictive factors for NE.

Results
The overall prevalence of enuresis was 9.52%. The prevalence of NE among boys and girls was 12.4% and 6.5%, respectively. Daytime incontinence was present in 18% of children. Of enuretic children, 59.2% had a positive family history of enuresis. Constipation was found in 13.2% of children with enuresis and there was no significant association between NE and the presence of constipation. In addition, 48% of enuretic children had poor school performance.

Conclusions
The current study demonstrated that age, male gender, parents' history of enuresis, and siblings' history of enuresis were significant predictive factors for NE. The majority of the parents did not have adequate interest in enuretic children and most of the children were not treated. Physicians should inform parents of enuretic children with the aim of solving this problem to prevent future issues and development of adulthood lower urinary tract symptoms (LUTS).

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Introduction

Nocturnal enuresis (NE) is a common childhood disorder and is defined by an intermittent wetting during sleep after organic causes have been ruled out, with a minimum wetting frequency of once per month [1,2]. Enuresis is differentiated according to the presence of LUTS (monosymptomatic and non-monosymptomatic); it is also classified according to the longest period of dryness: primary (<6 months dryness) and secondary (relapse after >6 months dryness). Eighty to 90% of enuresis cases are identified as primary enuresis and are based on genetic predisposition, biological, and developmental factors [3,4]. On the other hand, secondary enuresis frequently arises from psychological factors [5]. Most studies have shown that NE has a multifactorial etiology [6,7].

Genetic factors have a decisive role in NE. Many studies showed that NE was a highly familial disorder. In an epidemiological study of 3206 children, the risk of NE was five to seven times higher if one parent had a history of NE, and 11.3 times higher if both parents had a history of NE [8]. In a Finnish twin cohort study, the concordance rates for NE were 46% for monozygotic twins and 19% for dizygotic twins [9].

There are three commonly offered mechanisms to bedwetting: excessive nocturnal urine production, bladder overactivity, and failure to awaken in response to bladder sensations. This health disorder can lead to emotional distress and concern for both children and parents. Enuresis often has psychological consequences such as low self-esteem in children and low school performance [10].

The aim of this study was to determine the prevalence and associated factors of NE among primary school children. We also aimed to investigate the effect of enuresis on the quality of life and the perception of parents regarding NE and treatment modalities.

Materials and methods

A prospective cross-sectional epidemiological study was conducted from January 2013 to May 2013 in 10 randomly selected primary schools from the two major districts of Ankara, capital of Turkey. A questionnaire was distributed to the parents of 4250 school children, aged 6–13 years.

The questionnaire consisted of three parts. The first part was designed to investigate the demographic characteristics of the child and family, such as age, gender, number of siblings, and enuresis history of the parents and siblings. The second part consisted of questions about the presence and frequency of bedwetting, presence of constipation/fecal incontinence, and presence of daytime incontinence (DI). Children were classified as constipated if they had frequency of defecation three or fewer times per week and the presence of straining during defecation [11]. The last part surveyed school performance and the effect of enuresis on quality of life on parents and children. The response to the question, "Do you find your child's bedwetting disturbing?" was used to assess the effect of NE on quality of life. The response to the question, "How is your child's school performance?" was used to assess the effect of NE on quality of life. The scale comprises the effect of bedwetting in school performance. The scale is scored from 0 to 10 in increments of 1, where the excellent (not effecting) is scored 0 to 2, good (less effecting) is scored 3 to 5, fair (effecting) is scored 6 to 7, and poor (much effecting) is scored 8 to 10. Additionally, this part contained questions about the perception of parents regarding NE and treatment modalities (medication, alarm treatment, and fluid restriction).

There were 118,045 students in these age groups in our survey population. The sample was selected using simple random sampling based on the prevalence of NE, which was reported as 11.5–12.9% in recent studies performed in Turkey ($p = 0.12$ and $d = 0.01$). The survey should have been completed by at least 3920 children. Results are reported as frequencies and percentages. Logistic regression analyses were conducted to determine the significant predictive factors for nocturnal enuresis. Statistical analyses were performed with SPSS 16.0 (Chicago IL, USA) and the level of significance was established as 0.05 (two-sided).

Results

A total of 4250 questionnaires were distributed and 2561 (60.2%) participants completed the questionnaire; 1984 (46.7%) were fully completed and included in the final analyses. Children were between 6 and 13 years of age, with an average age of 8.92 years (SD ± 2.068 years). The average age of children with enuresis was 7.96 ± 1.494. Among them, there were 1018 (51.3%) boys and 966 (48.7%) girls. Daytime incontinence (DI) was present in 18% (34/189) of children with enuresis. The overall prevalence of enuresis among children was 9.52% (189/1984). Prevalence of NE among boys and girls were 12.4% (126/1031) and 6.5% (63/953), respectively ($p < 0.012$). The prevalence of enuresis according to age group declined from 45% at 6–7 years to 4.8% at 12–13 years (Table 1). Of enuretic children, 59.2% (112/189) had a positive family history of enuresis. Constipation was found in 13.2% (25/189) of children with enuresis. Although constipation was evaluated in accordance with description from parents, there was no significant association between enuresis and the presence of constipation ($p = 0.054$). Additionally, there was no significant association between enuresis and the number of siblings ($p = 0.40$). The average numbers of

Table 1 Distribution of enuretic children according to age and gender.

Age, years	Boys		Girls		Total	
	n	%	*n*	%	*n*	%
6	18	9.5	0	–	18	9.5
7	39	20.6	26	13.75	65	34.4
8	42	22.2	16	8.4	58	30.7
9	20	10.5	12	6.3	32	16.9
10	2	1.05	0	–	2	1.1
11	5	2.64	0		5	2.6
12	0	–	3	1.59	3	1.6
13	0	–	6	3.17	6	3.2
Total	126	66.66	63	33.34	189	100