



ADVANCED MANAGEMENT OF NOCTURNAL ENURESIS, PREVALENCE AND RISK FACTORS: A CROSS-SECTIONAL STUDY ON SYRIAN CHILDREN

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Background: Enuresis refers to intermittent incontinence during sleep. Intermittent incontinence (II) is discrete urine leakage of children over five years old in clothes or in bed that happens twice a week for three consecutive months. It may occur during daytime (DI) and/or night (nocturnal incontinence or nocturnal enuresis-NI) and children over five years of age are more subjected to it. Enuresis has a significant clinical burden and causes social, psychological, and emotional distress.

Drugs (including desmopressin, tricyclics, and other drugs) have often been tried to treat nocturnal Enuresis



Objectives: The main aim of this study was to determine the advanced management methods of nocturnal Enuresis through assessing its prevalence and the factors associated with it among Syrian children.

Methodology: A cross-sectional study was conducted in the period of (February 2019- May 2019) among 250 Syrian primary school children \geq five years old in Aleppo City, SYRIA

Results: Various strategies of the most proper treatments have been significantly different, and the least applicable is the use of bed alarm and physical therapy methods In nocturnal Enuresis, motivational therapy, alarm therapy, and drug therapy, such as anticholinergics, imipramine and sertraline are the mainstay of treatment

Recommendations: Our study reveals the importance of Routine medical examination and laboratory investigations of children for early evaluation of the problem and proper treatment of such cases.

Keywords: Nocturnal Enuresis - primary school children – Risk Factors–Treatment



INTRODUCTION

Nocturnal Enuresis (NE) refers to an inability to control urination during sleep, which is generally regarded as undesired or pathological conduct. Nocturnal Enuresis is an issue that has been in the interests of doctors and other people who work with children professionally [1]. Nocturnal Enuresis also is known as bedwetting can be defined as the involuntary urine passage while sleeping beyond the age of anticipated night time bladder control in children. The second most common disorder following allergic diseases and nocturnal Enuresis in children [2]. Nocturnal Enuresis (NE) can cause a variety of behavioral, psychological, and social problems such as embarrassment, blushing, a lack of self-esteem, and aggression. It is, therefore, necessary to identify children at risk and take therapeutic measures [2-3]. Nocturnal Enuresis (NE) is a health problem that is often encountered in childhood and is defined in the absence of acquired or congenital central nervous system defects as an implicit void of urine during sleep at a frequency of at least twice a week in infants over five years of age [4]. Enuresis (bedwetting) is a socially stigmatizing and stressful condition which affects around 15% to 20% of five-year-old. NE was reported to be around (10%) of all seven-year-old children and up to 2% of young adults. Although there is a high rate of spontaneous remission, the social, emotional, and psychological costs to the children can be significant. The spontaneous annual resolution rate, however, ranged between (15%- 16%) [5-6]. Recent studies have estimated NE in children aged five years and older with male dominance and a positive family history of Enuresis to be around 20 percent. The frequency of NE prevalence in children decreases with age; however, about 1% of children with NE continue to do so in adulthood [7]. It has generated a wide range of explanatory hypothesis and treatment approaches that have generally reflected dominant current trends in medical theory and practice [8-9-10]. Nocturnal Enuresis is classified as primary (no prior period of sustained dryness) or secondary (nighttime wetting recurrence after six months -or longer- of dryness) [11]. Children with NE often cause stress to parents and family members. NE events may cause sleep loss if the child wakes up and/or cries waking the parents.



There have been many efforts to describe the organic causes of the problem of varying sorts, ranging from food allergy [12] to meatal stenosis[13]. Most students of the problem are unimpressed by such suggestions. *Hallgren (1957)* found that only (1-3%) of his large series showed any abnormality of the urinary tract [14], and *Finch (1960)* estimated that only 5 percent of enuretic children would show any significant organic factor [15] although a long tradition exists of attributing this symptom to "bladder instability" [16] and/or "heredity" [14].

Nocturnal Enuresis was considered psychiatric/psychological disorder almost until the end of the last century; however, the perspective has shifted to physical factors. The most cases of Nocturnal Enuresis are pathogenically caused by Nocturnal polyuria or nocturnal detrusive excess activity, both in addition to a high arousal threshold. [17]

Despite several treatment strategies [18-19-20-21], some children are resistant to standard therapy, which is challenging to their families and has a significant influence on their quality of life. Therefore, it is essential to search for effective treatment in order to minimize the multi-factorial effects of this condition

SUBJECTS AND METHODS

A Cross-Sectional study was performed on 250 school children with age ranges from (5 – 10) years in six different primary schools in Aleppo, Syrian Arab Republic, between February and May 2019. A stratified random sampling technique has been chosen for students. The study's objectives were explained to the local educational authorities, which allowed the survey to take place. The work was done following the World Medical Association Ethics Code (Helsinki declaration) for human-related experiments, and parents have given their approval to participate in our study.



A questionnaire was prepared in order to collect socio-demographic data, data on Enuresis, and influencing factors. There were two parts in the questionnaire—one for enuretic children and the other for non-enuretic children. It was a small survey that was completed in about 15-20 minutes. The specific questionnaire was organized by epidemiological research from Syria and other countries on Nocturnal Enuresis. In the local language, there were 18 selected questions. The questions related to the enuretic children can be classified under five categories: descriptive children's and parents' questions, questions about the overall family approach to children, children's educational success, general behavioral and children's NE. In order to avoid any embarrassment of the children, the questionnaires were distributed to all selected students in sealed envelopes, and their teachers requested them to handle the questionnaire to their parents at home. Statistical analysis for data entry and analysis was performed using the SPSS Statistical Program. Chi-square test and significant p-value, if less than 0.001, have been considered positive.



RESULTS

Out of a total of 250 student samples, 115 (46%) were male, and 135 (54%) were female (Figure 1). The age group from 5 to 6 years represented 157 children (62.8%), the age 7–8 years represented 64 children (25.6%), and the age 9–10 represented 29 children (11.6%) in the current study (Figure 2).

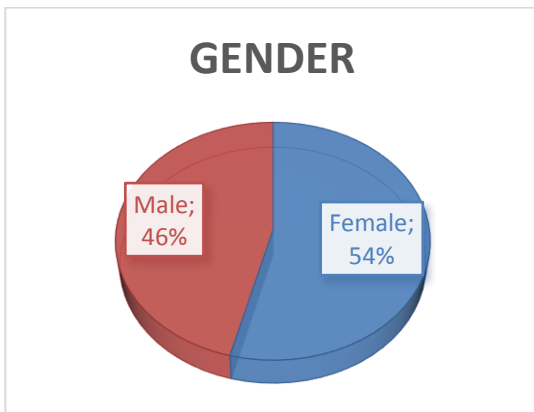


Figure 1

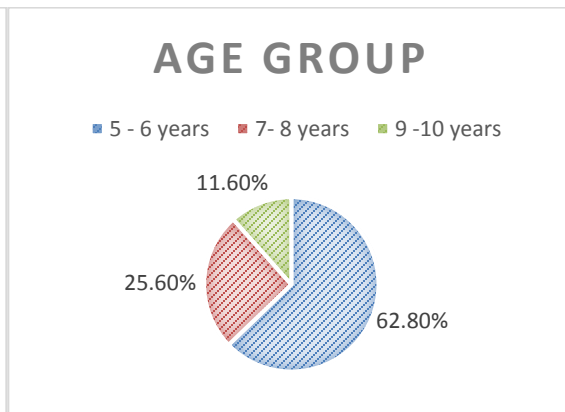


Figure 2

Parents of the studied children were mostly (92.8%) married, whereas few (4.8%) of them were divorced (Figure 3). Moreover, more than half of their parents (father and mother) have not attained university education (51.6% and 52.4%, respectively). Furthermore, a significant percentage (88.0%) of their fathers were employed, while most (65.7%) of their mothers were housewives

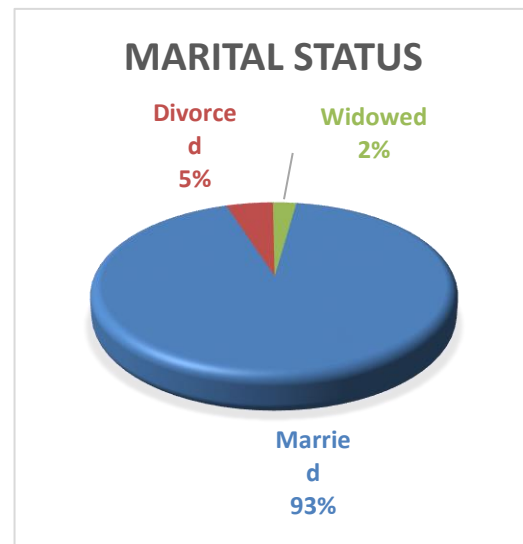


Figure 3



Furthermore ,children having NE showed mainly (48.4%) good school performance, while the excellent performance was the most frequent (51.7%) among children having no NE ($p < 0.05$).The development of NE in the studied subjects showed significant association with the history of NE in one of the family members ($p < 0.001$)

Table 1:Prevalence of Enuresis concerning the gender of the studied children:

Gender									
Nocturnal Enuresis		Female		Male		Total		<i>p-Value</i>	
		No.	%	No.	%	No.	%	0.02	
		Yes	83	61.48	97	84.35	180		
No	52	38.52%	18	15.65	70	28			

Table 1

Among the studied subjects, 180 participants (72%) had NE, while 70 (28%) recorded none. Table 1 shows that the prevalence of NE was significantly higher in boys than girls (84.35% vs.61.48%, respectively). The highest prevalence of NE (74.52%) was found in the (5-6)-year-old group, and the lowest rate (48.28%) was reported among the higher age group (9-10 years old) with a significant difference between the studied age groups ($p < 0.001$) (Table 2). The results of the study showed that the frequency of nocturnal Enuresis decreases markedly as the age increases with a highly significant level ($P < 0.001$).

Table 2:Prevalence of Enuresis concerning the ages of the studied children: (Chi-Square test)

Age groups (years)										
Nocturnal Enuresis		5-6 Y		7-8 Y		9-10 Y		Total		<i>p-Value</i>
		No.	%	No.	%	No.	%	No.	%	<0.001*
		Yes	117	74.52	49	76.56	14	48.28	180	
No	40	25.48	15	23.44	15	51.72	70	28		

Table 2



The current study focused on the frequency of wetting times per week. By considering the wet nights/week, children wetting the bed 1–3 times/week were 59 (51.3%), those wetting the bed 4–5 times/week were 33 (32.9%), and those wetting the bed 6–7 times/week were 23 (28.7%). Family troubles were found in 115 children (63.89%) and absented in 65 children (36.11%).

DISCUSSION AND CONCLUSIONS

Enuresis is a pediatric public health problem that is associated with smaller age, low socio-economic factors, low educational level, family history of Enuresis, history of urinary tract infection and GIT troubles in addition to a lot of emotional and psychological problems. It leads to low self-esteem, some secondary psychological problems, and low school success. Nocturnal Enuresis is a public health issue among Syrian children, as in many other populations [22]. The frequency of nocturnal Enuresis among the selected children in our study was found to be 72%. Such result was in Contrast with the previous cross-sectional study carried out on 640 students by *Kalo et al.* in Syria who mentioned that; the prevalence of nocturnal Enuresis among school-aged children was reported 15% [23]. Another study carried out in Turkey on 7–11 years old children showed that the prevalence of NE was 14% [24]. Furthermore, a study on Egyptian students aged 6–12 years in Benha city reported a rate of 15.7% for NE. A lower prevalence of NE was also reported among school children in Isparta (11.5%), Istanbul (12.4%), [2,24,26], and Ankara (17.5%)[27].

In our study, education of the father was significantly associated with NE, where children having NE showed a significantly lower percentage of university education compared to those having no NE. Besides, housewife mothers were found to have more enuretic children than working mothers (65.7%), and such results agree with the study which mentioned that working mothers were found to have less enuretic children than housewives [28]. This can be explained by the fact that working mothers encourage early toilet training or seek treatment for such a condition at an earlier age.



On the other hand, there is research performed in Iran reported that working mothers were found to have more enuretic children than housewives. In Contrast, the presence of family troubles of NE cases was not a compelling social and psychological issue affecting the epidemiology of Nocturnal Enuresis. Approximately all the students' families (92.8%) were happily married couples that did not suffer from family troubles. These results were in agreement with a study in Asyut city, Egypt [28], where there was no significant difference between the enuretics and non-enuretics as regards family troubles (parents are living together or not). On the other hand, this was in Contrast with *Carman et al.* [29], who mentioned that there is a close relationship between disturbed family environment and the frequency of Enuresis, and this prevalence is 29.4% among disturbed families.

Several epidemiological investigations of NE in various regions of the world have been conducted and have shown a significantly reduced prevalence among comparable age groups, including in Western Europe [30], Taiwan [31], Thailand [32]. Differences in sample size, Sampling, age range, and NE definition could be attributed to the differences observed. The results of the current study showed that family history of nocturnal Enuresis was the most contributing risk factor. 29% of cases reported that nocturnal Enuresis was a problem in their families, 21.5% reported a positive brother/ sister enuresis history with a highly significant difference ($P < 0.001$). Our results come online with many other studies. [33-34-35]

Our research showed that the treatment methods assumed by the enuretic children and their parents in an attempt to overcome this problem, were as follows; the highest method of treatment option was waking a child for voiding (57.3%), followed by water prevention (43.3%), using drugs was used in 12% however, only 4% of enuretic children use diapers.



RECOMMENDATIONS

NE in children is an alarming complaint that needs proper evaluation and proper management. From the results of the current study, the following is recommended:

- Programs for raising parent awareness regarding nocturnal Enuresis.
- Regular medical examination and laboratory investigations of children for early evaluation of the problem and proper treatment of such cases.
- Gastro-intestinal tract evaluation should be in mind during the management of a child with NE.
- Pelvic floor exercises should be done, and the child had to be aware of pelvic floor muscle action.
- Parent's reaction toward the child should be supportive and encouraging him to pass this state.



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Appendix 1: Questionnaire

Socio-demographic Characteristics in children with/without NE

I. Family Status

Name of Father: _____

1. Father Education:

- University degree or more
- Below University level
- Illiterate

2. Father Occupation: _____

Name of Mother: _____

3. Mother Education:

- University degree or more
- Below University level
- Illiterate

4. Mother Occupation: _____

5. Socio-economic status:

- High
- Middle
- Low



6. Marital Status

- Widow
- Divorced
- Married

Name of Child: _____

7. Age (years):

- 5-6
- 7-8
- 9-10

8. Gender:

- Male
- Female

9. Number of children in the family

- Only 1
- 2-3
- 4-5
- 5<

10. Birth Order:

- 1st
- 2nd
- 3rd or more



11. Recent changes in the living place

- Yes
- No

12. Child performance at school

- Good
- Weak
- excellent

13. Frequency of bed wetting weekly

- Every night
- 1-3 times
- 4-5 times
- 6-7 times

14. Sleeping Deep Prevalence

- Yes
- No

15. Family History of NE

- Yes
- No

16. Respiratory infection

- Yes
- No



17. Methods of Treatment

- Water prevention before sleeping
- Awakening for Voiding
- Diapering

18. Parental Reaction towards NE

- Nothing
- Punishment
- Consult Physician