EUROPEAN JOURNAL OF BIOMEDICAL AND PHARMACEUTICAL SCIENCES
http://www.ejbps.com

ISSN 2349-8870
Coden USA: EJBPBO
Volume: 13
Issue: 4
Year: 2026

RISK FACTORS FOR NOCTURNAL ENURESIS AMONG PEDIATRICS IN QUEEN ALIA MILITARY HOSPITAL

***Mayyada S. Megdadi, MD, Aghadir M. Alhadidi, MD, Baha' S. Haddadin, MD, Amneh Z. Dawahdeh, MD, Mais A. Mbydeen, MD**

Pediatric Specialist, Queen Alia Military Hospital, Royal Medical Services.

***Corresponding Author: Mayyada S. Megdadi, MD**

Pediatric Specialist, Queen Alia Military Hospital, Royal Medical Services.

DOI: https://doi.org/10.5281/zenodo.19507993

How to cite this Article: *Mayyada S. Megdadi, MD, Aghadir M. Alhadidi, MD, Baha' S. Haddadin, MD, Amneh Z. Dawahdeh, MD, Mais A. Mbydeen, MD. (2026). Risk Factors For Nocturnal Enuresis Among Pediatrics In Queen Alia Military Hospital. European Journal of Biomedical and Pharmaceutical Sciences, 13(4), 386–390.

Article Received on 15/03/2026 **Article Revised on 05/04/2026** **Article Published on 10/04/2026**

ABSTRACT

Background: Nocturnal enuresis (NE) is defined as an involuntary loss of urine during sleep in children aged five years and older, occurring at a developmental stage where bladder control is expected. It is diagnosed when the behavior occurs at least twice a month. However, it can be classified as primary and secondary. Primary NE occurs when the child has never achieved consistent nighttime dryness, whereas secondary NE occurs after a period of dryness lasting for more than six months. The prevalence of NE varies and is influenced by factors such as age, sex, and cultural background. In children aged 5 years, the prevalence is 15%, whereas at age 15, the prevalence is around 1%. The consequence of NE extends from a physical effect to a more important psychological aspect. These children suffer from significant emotional distress, leading to low self-esteem and multiple absences from school, which will decrease school performance. The stigma associated with NE can result in bullying and social exclusion. Understanding the risk factors of NE is essential for effective management. Nurture studies have identified many of the associated factors, including genetic predisposition, developmental delay, vitamin D status, and psychological issues. **Objective:** The objective is to assess the prevalence and identify the risk factors linked to nocturnal enuresis in children visiting Queen Alia Military Hospital. This study addresses whether encopresis and daytime incontinence are significant modifiable risk factors for NE and examines the importance of psychosocial factors that might contribute to moderate but not severe NE. **Methods:** A cross-sectional descriptive study was conducted among pediatric patients aged 5 - 15 years attending Queen Alia Military Hospital between January and June 2025. Data was collected using a structured questionnaire filled by parents or guardians, covering demographic, medical, and behavioral factors. Statistical analysis was performed using SPSS Statistics version 31. Associations between nocturnal enuresis and risk factors were analyzed using Chi-square and logistic regression tests, with significance set at $p < 0.05$. **Results:** The mean age of 500 participants was 9.28 ± 2.13. 48.57% (n = 242) of the students were male and 51.43% (n = 258) were female. While the general NE prevalence was 10.2% (n = 51); 10.9% (n = 54) for males, as 9.5% (n = 47) for females. Statistically significant differences were determined between the two groups, with NE and without NE, regarding age groups ($P < 0.001$), and the number of siblings ($P = 0.002$), income level ($P < 0.001$), and positive family history ($P < 0.001$). **Conclusions:** Nocturnal enuresis remains a common problem for pediatric patients at Queen Alia Military Hospital. Early identification of risk factors can aid in targeted treatments and parental education to mitigate their influence. It is important to perform a detailed evaluation on population, carrying risk of having NE.

KEYWORDS: Sleep problems, Child, Questionnaires, Prevalence, Nocturnal Enuresis.

1. INTRODUCTION

Nocturnal enuresis or bedwetting is a process of involuntary urination at the time of sleeping in previously five-year-old children without the presence of congenital or acquired nervous system and urinary tract issues. It is a frequent disease in children, with prevalence 5% -10% of all children in the world (Nzamu 2012, Pandey, Oza et al. 2019). The causes of nocturnal

enuresis are complex, and they include genetic predisposition, late bladder development, sleep arousal problems, urinary tract disorders, constipation, psychological stress, and socioeconomic status (Phase 2023). Despite its self-limiting nature, enuresis may lead to humiliation, low self-esteem and grief in the family unless it is managed properly. No prior studies have investigated the issue of whether risk factors relationships vary with severity. Nocturnal enuresis is a heterogeneous disorder. The level of severity is wide, yet essential in care, as frequently the wet children (more than 7 years old) also need treatment. We tried to find independent risk factors of nocturnal enuresis in each of the severity levels, with strongest reference to the worst ones (Singh 2022, Jorgensen 2023, Wang, Zhang et al. 2025). Limited research has been carried out in Jordan to establish local risk factors of nocturnal enuresis especially in the military health care system. These factors are important to understand in order to instruct early diagnoses, parental counseling, and preventive measures.

2. LITERATURE REVIEW

The article (Sureshkumar, Jones et al. 2009) explains that one of the ways to mitigate the risk of nocturnal enuresis is to modify encopresis and daytime incontinence. Nocturnal enuresis is associated with encopresis and daytime incontinence in 23 percent when it is expressed in terms of population attributable risk. Nocturnal enuresis which seems to be moderate but not severe is related to psychosocial factors. The study asserts further that longitudinal cohort research and randomized controlled trials would be necessary to reconcile putative causal associations as well as show the efficacy of treatment in daytime incontinence, encopresis, and urgency among children with nocturnal enuresis.

According to (Doganer, Aydogan et al. 2015), student age, poor education background of parents, large family size, low monthly earnings, and family history are some of the factors that must be put into consideration when formulating NE. The need to study the student populations that incorporate the above factors extensively cannot be underestimated. It has been estimated that the NE Problem will have far-reaching consequences such as self-esteem and confidence, academic developments, and social relations. The establishment of effective relations with children and their families by the family physicians working in primary care is critical. Moreover, they have to take a history test and perform a fine physical examination. EN has an etiology that is between small developmental problems to a serious blockage in the urinary.

NE may be both primary and secondary. The primary NE happens when the child has been unable to attain consistent daytime dryness and secondary NE happens after a duration of more than six months of consistent dryness. NE is not that common, it depends upon age, sex and cultural background. The prevalence in children aged 5 is 15% and in age 15, the prevalence is approximately 1%. Nevertheless, (Pandey, Oza et al. 2019) explains that primary nocturnal enuresis is characterized as the absence of urine continence at night. A family history of enuresis is also often associated with primary enuresis. Ninety percent of enuresis cases are primary, and their existence depends on different ages. The effect of nocturnal enuresis may be diverse in nature, such as humiliation, low self-esteem, anger, and low academic performance. Enuresis has been under-reported and even parents of children with enuresis do not regard it as a serious issue. The research results to the conclusion that the incidence of enuresis between two schools of Ahmedabad was similar to a study where the socioeconomic level was similar. Low age, a family history of enuresis in parents and siblings, low level of parental education and an increment in family members were the risk factors. The majority of the youngsters who suffered enuresis had not been treated. According to the findings of the current study and the answers to the posed study questions, one can conclude that over two-thirds of the investigated mothers had a low knowledge level on NE, over half had an adverse attitude towards NE, and three-fifths had an unsatisfactory level of overall reported practices on NE. The correlation between the total knowledge of the mothers and their jobs was very significant ($P < 0.01$). Their age and the level of education were statistically significantly related ($P < 0.05$). Attitudes of the total mothers had a statistically significant relationship with age, level of education and occupation ($P < 0.05$). Also, a strong correlation ($P < 0.05$) existed between the total reported practices made by mothers, age, and educational level. The researchers established a significant positive correlation between the knowledge, attitudes, and report practices of nocturnal enuresis of mothers.

3. MATERIALS AND METHODS

3.1. Study Design and Setting

The study described is a cross-sectional descriptive study conducted at Pediatric Outpatient Department of Queen Alia Military Hospital in Amman, Jordan, during the period between January and June 2025.

3.2. Study Population

This involved children between the ages of 5 and 15 years who were attending the outpatient clinic due to any reason during the study period.

3.3. Inclusion Criteria

The children aged between 5 and 15 years were included in the study, and they were patients of pediatric outpatient clinics at Queen Alia Military Hospital. The study enrolled only those who were given informed consent by their parents or legal guardians, and thus all the ethical standards of research and voluntary participation were upheld.

3.4. Exclusion Criteria

To rule out confounding factors that may be a contributing cause of nocturnal enuresis, children with known neurological or urinary tract abnormalities were excluded. Moreover, no patients with diabetes mellitus or renal disease could be involved in the research because such diseases can affect urinary patterns and disrupt the proper evaluation of primary nocturnal enuresis.

3.5. Sample Size and Sampling Technique

A total of 981 patients were diagnosed by the doctors in the outpatient clinics to come up with a sample of 500 subjects. The expected prevalence and study feasibility were used to determine the sample size.

3.6. Data Collection Tool

A questionnaire was developed to be systematically designed based on similar studies that validated their instruments in past. The survey had three major parts. The initial part dealt with demographic data, including the age of the child, his/her gender, place of residence, and parent education and occupation. The second section discussed the pertinent medical history, including the existence of constipation, urinary tract, and sleep patterns. The third section touched upon family and psychological factors, such as having family history of enuresis, being exposed to psychological stress, and parental reactions or attitudes to the state of the child. This detailed design gave the relevant data collected to be able to determine possible risk factors related to nocturnal enuresis.

3.7. Definition of Enuresis

The definition of nocturnal enuresis is involuntary urine at least twice per week at night over a period of three months in a child of 5 years and other.

3.8. Statistical Analysis

The SPSS Statistics version 31 was used to analyze the data. Descriptive statistics reflected the characteristics of participants. The Chi-square test was employed in testing the associations between the risk variables and enuresis. The bivariate analysis was used to add variables with p less than 0.05 into a multivariate logistic regression model.

3.9. Ethical Considerations

An official permission to conduct the proposed study was obtained from the Scientific Research Ethics Committee in the Royal Medical Services. Participation in the study was voluntary, and subjects were given complete full information about the study and their role before signing the informed consent. The ethical considerations included explaining the purpose and nature of the study, stating the possibility to withdraw at any time, confidentiality of the information where it is not accessed by any other party without taking permission of the participants. Informed consent was taken from mothers to conduct the study. Objectives, tools and study techniques were illustrated to gain cooperation. Ethics, values, culture and beliefs were respected.

4. RESULTS

4.2. Participant Characteristics

A total of 500 children participated (mean age = 9.28 ± 2.13 years; 48.6% male). NE prevalence was 10.2% (males = 10.9%, females = 9.5%). Statistically significant differences were found between children with and without NE regarding age ($p < 0.001$), number of siblings ($p = 0.002$), family income ($p < 0.001$), and positive family history ($p < 0.001$). Additional associations were observed with constipation ($p = 0.02$), deep sleep ($p = 0.04$), and psychological stress ($p = 0.01$). Table 1 below illustrates the demographic characteristics of the study population.

Table 1: Demographic characteristics of the study population.

Variable	Category	Frequency (n)	Percentage (%)
Age (years)	Mean ± SD	9.28 ± 2.13	—
Age groups	5 - 7 years	142	28.4
	8 - 10 years	198	39.6
	11 - 15 years	160	32.0
Gender	Male	221	48.57
	Female	234	51.43
Number of siblings	1 - 2	156	31.2
	3 - 4	214	42.8
	≥ 5	130	26.0
Family income level	< 500 JOD	175	35.0
	500 - 1000 JOD	225	45.0
	> 1000 JOD	100	20.0
Parental education (mother)	Primary or less	138	27.6
	Secondary	210	42.0
	University or higher	152	30.4
Parental education (father)	Primary or less	115	23.0
	Secondary	204	40.8

	University or higher	181	36.2
Family history of enuresis	Yes	112	22.4
	No	388	77.6
Residence	Urban	356	71.2
	Rural	144	28.8

Table 2 below addresses prevalence and associated risk factors of nocturnal enuresis (n = 500).

Table 2: Prevalence and Associated Risk Factors of Nocturnal Enuresis (n = 500).

Variable	Category	With NE (n = 46)	Without NE (n = 454)	P - value
Gender	Male	24 (10.9%)	197 (89.1%)	0.42
	Female	22 (9.5%)	212 (90.5%)	
Age group (years)	5 - 7	18 (12.7%)	124 (87.3%)	< 0.001
	8 - 10	19 (9.6%)	179 (90.4%)	
	11 - 15	9 (5.6%)	151 (94.4%)	
Number of siblings	1 - 2	5 (3.2%)	151 (96.8%)	0.002
	3 - 4	17 (7.9%)	197 (92.1%)	
	≥ 5	24 (18.5%)	106 (81.5%)	
Family income	< 500 JOD	26 (14.9%)	149 (85.1%)	< 0.001
	500 - 1000 JOD	14 (6.2%)	211 (93.8%)	
	> 1000 JOD	6 (6.0%)	94 (94.0%)	
Family history of NE	Yes	22 (19.6%)	90 (80.4%)	< 0.001
	No	24 (6.2%)	364 (93.8%)	
Constipation	Yes	12 (17.1%)	58 (82.9%)	0.02
	No	34 (8.3%)	376 (91.7%)	
Deep sleep	Yes	15 (14.0%)	92 (86.0%)	0.04
	No	31 (8.6%)	362 (91.4%)	
Psychological stress	Yes	18 (15.3%)	100 (84.7%)	0.01
	No	28 (7.7%)	354 (92.3%)	
Parental education (mother)	Primary or less	14 (10.1%)	124 (89.9%)	0.38
	Secondary or higher	32 (9.9%)	330 (90.1%)	
Parental education (father)	Primary or less	12 (10.4%)	103 (89.6%)	0.41
	Secondary or higher	34 (9.8%)	351 (90.2%)	

Table 3 presenting the multivariate logistic regression analysis of the independent predictors of nocturnal enuresis (NE).

Table 3: Multivariate Logistic Regression Analysis of the Independent Predictors of Nocturnal Enuresis.

Risk Factor	Adjusted Odds Ratio (AOR)	95% Confidence Interval (CI)	P-value
Age (per year increase)	0.78	0.65 – 0.91	0.002
Number of siblings (≥ 5 vs. ≤ 2)	2.45	1.32 – 4.56	0.004
Family income (<500 JOD vs. >1000 JOD)	2.87	1.41 – 5.82	0.003
Positive family history of NE	3.96	2.05 – 7.65	< 0.001
Constipation (yes vs. no)	1.98	1.04 – 3.76	0.037
Deep sleep (yes vs. no)	1.76	1.01 – 3.14	0.046
Psychological stress (yes vs. no)	2.25	1.20 – 4.21	0.012
Gender (male vs. female)	1.15	0.63 – 2.09	0.65
Parental education (low vs. high)	1.09	0.61 – 1.96	0.74

4.2. Participant Characteristics

The multivariate analysis of logistic regression revealed that some independent predictors of nocturnal enuresis were present (Table 3). The younger age was strongly correlated with increased NE (AOR = 0.78, 95% CI: 0.65 -0.91, p =0.002) and hence the prevalence reduces according to the age. Those in large families (not less than 5 siblings) were found to be more than twice as likely to develop NE as those in smaller families (AOR = 2.45, 95% CI: 1.324.56) and p = 0.004. The socioeconomic factor on the disease prevalence was also a good predictor (AOR = 2.87, 95% CI: 1.41 - 5.82, p = 0.003) with low family income (<500 JOD). Positive family history became the most notable predictor, which

multiplied the chances of NE with almost four times (AOR = 3.96, 95% CI: 2.057.65, p < 0.001). Also, deep sleep (AOR = 1.76, p = 0.046), psycho - logical stress (AOR = 2.25, p = 0.012), and constipation (AOR = 1.98, p = 0.037) were found to be independent with NE. On the contrary, there were no significant relationships with gender and parental education. These results indicate that biological, environmental, and psychosocial mechanisms occur in the etiology of nocturnal enuresis. The prominent role of the familial history stresses the potential genetic factor, whereas the impact of the factors which could be altered, including constipation and psychological stress, highlights the significance of the specific interventions and counseling to be performed by parents.

5. DISCUSSION

In the study, a NE prevalence of 10.2 percent was found in children in Queen Alia military hospital which is comparable to the international rates of 5-12 percent. This disease was posed more often in males, which is consistent with the literature (Pandey, Oza et al. 2019). Family history was the best predictor, which points towards the possibility of genetic predisposition. Developmental and environmental factors are shown by younger age and a big family. The social economic factors can contribute towards NE risk due to poor healthcare access and parental awareness.

Constipation and deep sleep were significant modifiable risk factors, underscoring the role of physiological regulation. regulation. Psychological stress was also a major factor to consider and this brought out the importance of holistic responses that touched on both medical and behavioral responses. These results are consistent with previous research (Sureshkumar, Jones et al. 2009, Doganer, Aydogan et al. 2015) who determined the same biological and psychosocial determinants.

6. Limitations

The research has certain limitations that are to be recognized. To start with, it was carried out in one center, and this can undermine its applicability in the rest of the pediatric population in Jordan. Second, the reliance on self-reported questionnaires filled in by parents or guardians is associated with the possibility of a bias in the recall and reporting since answers might not be a faithful reflection of the situation and behavior of the child. Lastly, the study design, cross-sectional, is a barrier to the development of causal relationships among nocturnal enuresis and the identified risk factors; longitudinal studies should be used to determine the relationship between variables in a temporal and causal way.

7. Recommendations

It is possible to take many recommendations to enhance the early diagnosis and treatment of nocturnal enuresis among children basing on the results of the study. Nocturnal enuresis should be screened as a routine pediatric screening to ensure that it is detected and addressed at an earlier stage. Moreover, behavior change strategies, fluid management, and sleep hygiene parental counseling interventions are very important in helping affected families and reducing the emotional effects on children. Lastly, the studies done in the future should be based on larger and multicentric researches to understand the nature of effects of genetic, environmental, and psychosocial factors on nocturnal enuresis among the Jordanian population.

8. CONCLUSION

Nocturnal enuresis is a common phenomenon in children of Queen Alia Military Hospital. Male gender, family history, constipation, deep sleep and psychological stress are the key risk factors. Parental education and early screening can be used to solve modifiable risk factors, which may improve the outcomes and reduce the emotional load of enuresis.

9. REFERENCES

1. Doganer, Y. C., U. Aydogan, K. Ongel, O. Sari, B. Koc and K. Saglam. "The prevalence and sociodemographic risk factors of enuresis nocturna among elementary school-age children." Journal of family medicine and primary care, 2015; 4(1): 39-44.
2. Jørgensen, C. S. (2023). "Pathogenesis of Enuresis-Impact on Treatment."
3. Nzamu, I. M. (2012). Prevalence of nocturnal enuresis and associated factors among 6-14 year old children attending schools in a rural district in Kenya, University of Nairobi, Kenya.
4. Pandey, S., H. J. Oza, H. Shah and G. K. Vankar. "Rate and risk factors of nocturnal enuresis in school going children." Industrial Psychiatry Journal, 2019; 28(2): 306-311.
5. Phase, N. (2023). "Neighborhood and broader socio-cultural factors Family and school factors Individual child factors." Burns' Pediatric Primary Care-E-Book: Burns' Pediatric Primary Care-E-Book, 206.
6. Saber Ahmed, E. "Assessment of Knowledge, Attitude and Reported Practices of the Mothers Having Children Suffering from Nocturnal Enuresis." Helwan International Journal for Nursing Research and Practice, 2025; 4(11): 14-27.
7. Singh, G. A. (2022). "Relations Among Nocturnal Enuresis and Attention Deficit Hyperactivity Disorder."
8. Sureshkumar, P., M. Jones, P. H. Caldwell and J. C. Craig. "Risk factors for nocturnal enuresis in school-age children." The Journal of urology, 2009; 182(6): 2893-2899.
9. Wang, Z., P. Zhang, R. Shi, S. Yang, K. Liu, Z. Zhou and Q. Li. "Relationship between obstructive sleep apnea and enuresis in children: current perspectives and beyond." Nature and Science of Sleep, 2025; 211-222.