Mothers Knowledge, Attitudes, and Practices Toward Nocturnal Enuresis Among Children in Baghdad, Iraq: A Cross-Sectional Study

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Abstract
Background: If we want to keep our school-aged children's physical and mental health in good shape and avoid future problems, we need to find out how much moms know about enuresis and how they feel about its treatment.
Aim of study: To assess the levels of knowledge, attitude and practices of mothers about nocturnal enuresis and to find the possible factors that may affect these levels.
Methods: A cross-sectional study of analytical components was conducted at three Teaching Hospitals in Baghdad over a one-year period from October 1, 2024, to October 1, 2025. It included mothers of children aged < 6 years attending the selected hospitals for any complaint. The participants' socio-demographic information, as well as their knowledge, attitudes, and habits regarding nocturnal enuresis, were assessed using a self-administered questionnaire.
Results: In this study, 59.3% of mothers had fair level of knowledge; 49.2% showed positive attitude, and 41.8% had fair practice level about nocturnal enuresis. Lower educational levels such as illiteracy and primary or secondary school, student occupation, and negative family history were independent risk factors for poor knowledge, attitude, and practice levels.
Conclusion: Majority of moms exhibited only fair awareness of NE, and less than half exhibited positive attitudes or adequate practices. Overall, their knowledge, attitude, and practice were poor. A lack of positive family history of NE, being a student, having lower educational attainment, and inadequate practices are consistently linked to poor knowledge, more negative attitudes, and inadequate practices.

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Introduction

The involuntary loss of urine during sleep in children aged five and older is known as nocturnal enuresis (NE), or bedwetting. This condition occurs at a developmental stage when bladder control is expected to be established [1]. Incontinence that occurs intermittently during sleep, at least once a month for at least three months, is a common symptom in children who are five years old or older [2]. When it occurs more than four times weekly, it is considered frequent enuresis; when it occurs less than four times weekly, it is considered infrequent enuresis [3]. NE is affecting 15% of 6-year-olds and 6.4% of all children [4]. There are two types of NE. Primary NE happens in youngsters who have never had regular nighttime dryness. Secondary NE happens after a dry spell of six months or longer. Multiple factors contribute to the complicated pathophysiology of NE. The following factors can play a role: a history of NE in the family, irregularities in the rhythm of production of antidiuretic hormone, problems sleeping, a delayed maturation of the bladder, a lack of maturity in the development of the nerves, psychological factors, and environmental factors [5]. Although NE is not associated with physical symptoms, such as pain or fatigue, it markedly impacts

on a child's mental well-being, contributing to low self-esteem, poor self-image, and a decline in school life quality and friendships. It also reduces the overall quality of life for both affected children and their parents [6]. Effective management of these difficulties requires age- and severity-specific approaches that are customized to the specific needs of each patient. Medication and behavioral therapy are two possible options [7]. Bed alarms, scheduled urination, and hydration restrictions are common behavioral measures. Some common drugs are oxybutynin, imipramine, and desmopressin. Functional magnetic stimulation and transcutaneous para-sacral electrical nerve stimulation are two forms of electrotherapy that have shown promise [8]. But some moms don't seek medical advice or therapy for their children with NE because of how little is known about the condition. Only a small percentage of moms, anywhere from 2.1% to 55%, will actually get their kids treated, according to the survey [9]. Mothers' perspectives and misunderstandings regarding enuresis can be transformed via education on the ailment, its causes, and appropriate therapies. As a result, parents and children may have better health outcomes and more regular doctor's visits [10]. Providing mothers with accurate information about NE significantly improves treatment success by ensuring adherence to proper recommendations, increasing effectiveness, reducing recurrence, and minimizing negative impacts of NE on children and their families [11]. The aim of this study was to assess the levels of knowledge, attitude and practices of mothers about NE and to find the possible factors that may affect these levels to reduce the bad consequences of NE caused by adults' lack of knowledge, negative attitude, and poor practice.

Subjects and Methods

A cross-sectional study with analytical components was conducted at three Teaching Hospitals (Al-Kindy, Al-Numaan, and Ibn AL Baladi) in Al-Rusafa side of Baghdad over a one-year period from October 1, 2024, to October 1, 2025.

Study population and sample size: The study included mothers of children aged < 6 years attending the selected hospitals for any complaint. They informed about the purpose of the study and those who will agree to participate were enrolled in the study. Participants who refused to participate in the study were excluded.

The equation that was used to determine the sample size is as follows: $n= (z^2pq)/d^2$, where n is the sample size, z is the unknown predicted proportion (0.5 is assumed), q is 1-p, and d is the absolute precision (0.05). Based on this computation, 384 participants were selected as the first sample size. The final sample size was revised to 423 participants to account for a 20% non-response rate and to enhance the study's power.

Sampling Technique: The mothers who participated in this study were chosen from the Al-Rusafa Health Directorate using a multi-stage sampling procedure. Of the twenty-four hospitals that make up the Al-Rusafa Health Directorate, three were chosen at random at first. In the second stage, 141 mothers were picked from each of the hospitals using a simple random sampling procedure. Visits were used for data gathering. The system to include the next participant was determined by the time it took to complete the interview with each participant. Fifteen to twenty minutes was the average time required for each interview.

Data Collection Tools: Participant socio-demographic information, NE knowledge and attitudes, and NE practices were the four corners of a self-administered questionnaire that collected data. The participants were given it right away and then given it back when it was over. An allocated panel edited, evaluated, amended, and approved the questionnaire after it was adapted from previous content to meet national needs [12]. Cronbach's alpha demonstrated acceptable internal consistency for mothers' practice (0.855), attitudes (0.845), and knowledge (0.961).

The first part included sociodemographic characteristics such as mothers' age, educational level, occupation, presence of both parents or not, and family history of NE.

The second part included physicians' knowledge about NE. The assessment comprised 12 questions designed to gauge mothers' understanding of NE. These questions covered topics such as the following: the meaning of NE, the most vulnerable groups for NE, its types, common causes, important anatomical causes, risk factors, complications, psychological effects, main management strategies, controlling measures, and prevention methods. For each question, one mark was deducted for an incorrect response and one mark for an accurate one. Higher scores indicate more knowledge, and the total score can be anything from zero to twelve. The levels of knowledge were 0 – 49% (0 – 5) represented poor knowledge, 50% – 74% (6 – 8) represented fair knowledge, and ≥ 75% (9 – 12) represented good level of knowledge.

The third part included mothers' attitude towards NE. The survey asked moms to rate their feelings toward NE using 17 different items. On a 3-point Likert scale, from 1 (strongly disagree), 2 (neutral), and 3 (strongly agree), the items are evaluated. A higher score indicates a more optimistic attitude; the total score ranges from 17 to 51 and is based on the 17 Likert scale items. It is a type of ordinal scale and generally used to quantify attitude and behavior with the use of quartile score as 0 - 59% (17 – 30) represented negative attitude, ≥ 60% (31 – 51) represented positive attitude [13].

The fourth part included mothers' practice about NE. Mothers' reactions to NE practices were measured using 32 items, including: physical care (10 items), psychological care (6 items), pharmacological therapy (4 items), behavior training (5 items), attention training (2 items) for a dry bed, and rewarding for behavior modification (2 items). A three-point Likert scale is used to classify the objects according to the responses to the questions, with 1 being always, 2 being sometimes, and 3 being never. The range was from 32 to 96 with better practice considered when there are higher scores and categorized by percentage based on summed scores as 0 - 59% (32 – 58) represented poor practice, and ≥ 60% (59 – 96) represented good level of practice [14].

Ethical considerations and official approvals: All procedures related to the study adhered to the 1975–2013 revisions to the Helsinki Declaration. Everyone who took part in the study was given the green light orally and asked for permission to take part. No one's identity was revealed. This investigation was the only use of the data.

Statistical analysis: The data was analyzed using SPSS version 28, which stands for Statistical Package for Social

Sciences. The data is presented using standard deviation, ranges, and mean. Statistical information presented in the form of percentages and frequencies. We ran logistic regression analysis with low KAP scores as our dependent variable and the variables found significant in the binary analysis as our independent variables. To be considered statistically significant, a P-value must be lower than 0.05.

Results

The ages of study participants varied from 25 to 44 years, with a mean of 32.41 ± 5.4 years. In this study, 54.4% of mothers were finished higher education; 57.4% were housewives; 91.5% mentioned that both parents were present in the family; and 19.1% had positive family history of NE. (Table 1).

Table 1: Study participants' distribution by general characteristics

Variable	No. (n= 423)	Percentage (%)
Mother Age (Year)		
< 30	96	22.7
30 - 39	201	47.5
≥ 40	126	29.8
Mother Education		
Illiterate	55	13.0
Primary or secondary school	138	32.6
Higher education	230	54.4
Mother's Occupation		
Employee	109	25.8
Housewife	243	57.4
Student	71	16.8
Presence of parents in the family		
Both of them	387	91.5
Father alone	14	3.3
Mother alone	22	5.2
Family history of NE		
Positive	81	19.1
Negative	342	80.9

Results showed that 59.3% of mothers had a reasonable understanding of NE, 49.2% had a positive attitude toward it, and 41.8% had a fair amount of experience with it in their daily lives (Table 2).

Table 2: Levels of total KAP scores

Variable	No. (n= 423)	Percentage (%)
Knowledge score		
Good	89	21.1
Fair	251	59.3
Poor	83	19.6
Attitude score		
Positive	208	49.2
Negative	215	50.8
Practice score		
Good	177	41.8
Poor	246	58.2

Table 3 shows the findings of the logistic regression analysis, which used the mothers' KAP levels regarding NE as the dependent variable. We identified four significant independent risk factors for low levels of knowledge. These factors were lower educational level as illiteracy (OR= 4.11 with 95% Confidence Interval (CI): 1.79 to 9.1) and primary or secondary school (OR= 3.15 with 95% CI: 1.13 to 7.22), student occupation (OR= 2.62 with 95% CI: 1.22 to 6.52), and negative family history (OR= 4.22 with 95% CI: 2.11 to 10.8).

There were three significant independent risk factors for negative attitude level. A negative family history (OR=3.72, 95% CI: 1.71 to 9.13), being an illiterate person (OR=6.29, 95% CI: 3.16 to 14.66), and being a student (OR=4.28, 95% CI: 2.41 to 11.51) were the following factors.

Three factors were found to be important independent risk factors for poor practice level. These factors were illiteracy (OR= 1.71 with 95% CI: 1.18 to 3.6), student occupation (OR= 5.41 with 95% CI: 2.22 to 12.6), and negative family history (OR= 4.68 with 95% CI: 1.47 to 8.7).

Table 3: Hypothesis testing using logistic regression on potential determinants of poor mothers' KAP levels with respect to NE

Variables		Odd's ratio	95% CI for odd's ratio
Poor knowledge level			
Lower educational level (Reference: Higher education)	Illiteracy	4.11	1.79 – 9.1
	Primary or secondary school	3.15	1.13 – 7.22
Student occupation (Reference: Employee)		2.62	1.22 – 6.52
Negative family history		4.22	2.11 – 10.8
Negative attitude			
Illiteracy (Reference: Higher education)		6.29	3.16 – 14.66
Student occupation (Reference: Employee)		4.28	2.41 – 11.51
Negative family history		3.72	1.71 – 9.13
Poor practice level			
Illiteracy (Reference: Higher education)		1.71	1.18 – 3.6
Student occupation (Reference: Employee)		5.41	2.22 – 12.6
Negative family history		4.68	1.74 – 8.7

Discussion

Since the 1960s, hygiene education has followed the knowledge, attitude, and practice model, with cognitive learning concentrating on information and its ability to be realized, affective learning on changing the subject's intention, attitude, or norms to improve themselves through hygiene education, and psychomotor learning on developing the learner's health behavior [15]. Many youngsters are impacted by NE, which is seen as a challenging and socially disruptive disorder. Everyone in the family, especially the kids, is quite embarrassed and worried about it [16]. This study showed that 59.3% of mothers had fair levels of knowledge, 49.2% showed positive attitude, and 41.8% had fair practice level about NE which is different to that found in Saber Ahmed E *et al* study in 2025 when reported that 69.6 % had poor level of total knowledge about NE [12] and different to a study conducted by Alarfaj HM *et al* study in 2024 as they found that 70% of mothers had good level of total knowledge [17]. Regarding attitude, a study by Khadke MD *et al* in 2024 mentioned that 61.5 % of studied parents had negative attitude regarding NE [18]. Factors that determined the differences in the above-mentioned studies can have related to different sample size, different educational level of the participants, and socioeconomic state which has a role in their attendance to specialized centers seeking help.

In the present study, lower educational level, student occupation, and negative family history are important possible determinants of poor levels of knowledge, attitude, and practice scores. Mallappa A *et al* study in 2014 shows that there was a significant association between knowledge score and the education of mother, but it didn't show any significant association with other demographic variables of mothers [19]. Parental medical attention for a child with NE was more common among women and those with advanced degrees. Evidence also showed a correlation between parental education level and enuresis management. Most people who took part in the study thought that the detrimental psychological effects on children were the primary motivation for getting NE therapy. Since the negative psychological consequences of NE on children are well-known, this shows a good level of knowledge. Decreased self-esteem, poor self-image, and social withdrawal are all symptoms of NE, according to previous research. The effects of NE are known to worsen with age [20]. A child's perspective on his NE might be shaped by his parents' views toward it, which in turn can affect the likelihood of effective treatment and the mitigation of harmful outcomes. Additionally, parental actions and adjustment were positively affected by attributions for children's NE [21].

We need a better understanding of the efficacy of NE treatments, more public understanding of the condition, and the eradication of myths, as our research shows. Campaigns, social media, school health programs, and conversations during health interviews between healthcare practitioners and adults—particularly parents—are all viable options for reaching this objective.

Study limitations

This study had the following limitations:

- Questionnaires that were either filled out by the participants themselves or given by interviewers were used to evaluate their knowledge, attitudes, and habits. These kinds of surveys are prone to biases such social desirability bias and recollection bias. In cases where delicate topics like child discipline and continence were involved, some moms may have exaggerated or omitted certain aspects of their daily routines.
- Despite its form, the KAP questionnaire can miss some nuance in mothers' NE-related thoughts and actions. The accuracy of the estimations could have been impacted by any flaws in the dependability or validity of the tool, such as its lack of comprehensive validation in this particular cultural and linguistic context.

Conclusion

According to the findings obtained by this study, majority of moms exhibited only fair awareness of NE, and less than half exhibited positive attitudes or adequate practices. Overall, their knowledge, attitude, and practice were poor. A lack of positive family history of NE, being a student, having lower educational attainment (especially illiteracy and only primary/secondary education), and inadequate practices are consistently linked to poor knowledge, more negative attitudes, and inadequate practices. These results bring attention to significant experiential and socio-demographic factors that can impede proper comprehension and management of NE.

All things considered, the findings highlight the critical importance of immediate, focused counselling and educational interventions, particularly for moms with lower levels of education, those who are students, and those who have never had NE in their families. Early diagnosis, better treatment, and possibly better outcomes for children with NE can be achieved through individualized health education programs that raise mothers' knowledge, encourage more positive attitudes, and promote actions based on research.

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