How to Cite:
Kamel, R. M., Fakher, W., & Afifi, D. Y. (2022). Nocturnal enuresis and related behavioral problems in children. *International Journal of Health Sciences*, *6*(S4), 12214–12226. https://doi.org/10.53730/ijhs.v6nS4.11836

Nocturnal enuresis and related behavioral problems in children

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***Abstract*---**Objectives: The purpose of this study is to investigate how the prevalence of emotional and behavioural issues in a sample of Egyptian youngsters relates to nocturnal enuresis. Methods:The Center of Social and Preventive Medicine at Cairo University's Enuresis specialised outpatient clinic served as the source of 200 of the youngsters for this cross-sectional study. Children in the NE varied in age from 5 to 14 years; their mean age was 8.6 2.3 years. There were just as many boys and girls among the children. Strength and Difficulties Questionnaire was used to evaluate behavioural problems (SDQ). Results: When it comes to emotional scale, 37% of participants fall into the abnormal category, and 41% were labelled abnormal when it comes to hyperactivity and inattention. Although 34% of the individuals reported aberrant scores for all issues, boy's average scores were significantly higher. the existence of behavioural and emotional issues in a sample Females scored lower on the hyperactivity-inattention scale than males (6.5 vs. 4.5; p-value 0.001) In summary, NE is linked to an increased incidence of behavioural issues that point to both internalising and externalising symptoms. These findings highlight the significance of taking into account these children's co-occurring behavioural and mental health issues and addressing them in their treatment plan in order to provide a higher standard of living for these kids and their families.

***Keywords*---**nocturnal enuresis, behavioural issues, strengths and difficulties questionnaire (SDQ).

Introduction

20 percent by the age of five. It becomes less frequent until age 15, when it reaches 1% to 2%. (1) Nocturnal enuresis is regarded as a common and upsetting issue in kids. Nocturnal enuresis is defined in DSM 5 as the involuntary or repeated voiding of urine into clothing or the bed in a child at least 5 years old, with a frequency of twice weekly for at least three consecutive months, or the presence of clinically significant distress or impairment in social, academic (occupational), or other critical areas of functioning. (2) Children's nocturnal enuresis has been linked to a number of problems, mostly biological ones such bladder dysfunction or improper Vasopressin release. Dossche et alfindings .'s (3) have also been connected to genetic variables, such as the genes for endothelial nitric oxide synthase (eNOS) and neuronal (nNOS), which are thought to alter the regulation of sodium and water excretion as endogenous diuretics (5) on the other hand parental discipline and psychopathology , the psychological wellbeing of children had been attributed to nocturnal enuresis [(6)].

Although nocturnal enuresis is not known to affect physical health of children ,many clinicians have related nocturnal enuresis to behavioral and emotional problems in those children[(7)] although studies have contradictory results among effect of nocturnal enuresis on psychological wellbeing of children Shreeram et al.[(8)] and Hamed et al. [(9)] studies in Egypt pointed to relevant relation of nocturnal enuresis on children which points to differences in cultural perspectives and parental acceptance of the disorder [(10)]. It was found that the presence of NE brings greater economic and social burden to the families.**[(11)]** Therefore the early identification and management of this disorder is considered among the necessities for the preserve of children's and families wellbeing **[(12)].** The purpose of this study is to examine the relationship between nocturnal enuresis and the existence of emotional and behavioural issues in children, as well as the toll that the disease takes on caregivers and the effects it has on children's lives.

What is presently known on this subject?
Nocturnal Enuresis is considered a common distressing problem in children. Although nocturnal enuresis is not known to affect physical health of children, many clinicians have related nocturnal enuresis to behavioral and emotional problems in those children.

What does this article add to the existing knowledge?
This study aimed to study the relation of nocturnal enuresis to the presence of emotional and behavioral problems in a sample of Egyptian children, being a developing country with high levels of stigma to those children, Abo ElReesh clinics being a large encashment area particioants in this study and represents the different levels and governments all over Egypt, although there was a study about nocturnal enuresis in Egypt, this is the first one to study that large sample size

What are the implications for practice?
This study spotted the light on the importance of considering comorbid psychiatric troubles and behavioral problems for these children. We recommend

to address these concerns in their treatment plan to guarantee a better quality of life for these children and their families.

Materials and Method

Ethical Considerations

The approval by the local ethical committee of child unit of psychiatry department, Cairo university was obtained on February, 2020

Study Design

The research, which used the semi-structural interview of Kasr AlAiny's psychiatry sheet and the SDQ from May 2020 to March 2021, was carried out as a cross-sectional study without a control group with the goal of examining the connection between nocturnal enuresis and the presence of emotional and behavioural problems in children.

200 kids who were recruited from the Cairo University Center of Social and Preventive Medicine's Enuresis specialty outpatient clinic were study participants. They ranged in age from 5 to 14 years and were all children of both sexes. A contiguous sample that was chosen in accordance with inclusion and exclusion criteria and interviewed from May 2020 to March 2021. After being evaluated by the clinician specialist urologist and found to be medically free. They were not given any psychotropic drugs after being evaluated by a specialised child psychiatrist.

The research was conducted as a cross sectional study without a control group aiming at studying the relationship of nocturnal enuresis to the presence of emotional and behavioral problems in children using the semi structural interview of Kasr AlAiny psychiatry sheet and SDQ through the period from May 2020 to March 2021

Research Hypotheses

H0: There will be no statistically significant as regards the presence of behavioural problems in children with Nocturnal Enuresis

Inclusion Criteria

- Children diagnosed as nocturnal enuresis according to DSM 5 diagnostic criteria DSM-5 (American Psychiatric Association (APA), 2013).[2]
  - Age: 5-14 years old
  - Sex: both girls and boys
  - Children whose parents provided an informed written consent and they provided an assent.

Exclusion Criteria

- Children with neurological diseases

- Children with pervasive developmental disorders, head injury with loss of consciousness, sensori-motor handicap or other chronic medical conditions (renal failure, hepatic failure, endocrinal, respiratory…etc).
- Children with intellectual disability
- Children with structural abnormalities or malformations of urinary tract or urogenital system (complicated enuresis)
- Children whose parents refused to give an informed written consent or they refused to give an assent.

Data Collection Tools

All subjects submitted to the following:
Clinical assessment
Psychiatric clinical interview

- It was held by a senior specialist of Psychiatry (Msc of Psychiatry) in the Nocturnal enuresis specialized clinic. Assessment was done according to DSM5 diagnostic criteria. Children were assessed for other possible comorbid psychiatric disorders as well, and were included in the study.

Background information was also obtained that covered the following parameters:

1. Demographic data including name, age, sex and birth order.
2. Developmental history including pregnancy, delivery and developmental milestones.
3. Medical history including any illness that needs regular care, psychotropic and non psychotropic medications, sensitivities to drugs and surgeries.
4. Past history of abuse (physical, neglect, sexual and psychological)
5. Past history of psychiatric illness
6. Family history of psychiatric illnesses

Psychometric assessment
The Arabic translated version of the Strengths and Difficulties Questionnaire (SDQ)[13]

The Strengths and Difficulties Questionnaire (SDQ)[14] is one of the most widely used behavioral screening questionnaire. The SDQ consists of: Scores are generated for the following five subscales of 25 attributes: emotional symptoms (5 items), conduct difficulties (5 items), hyperactivity-inattention (5 items), peer-relationship problems (5 items), and prosocial behaviour (5 items) (5 items). Each item receives a score between 0 and 2. With the exception of the last subscale, all subscales are added together to get a total difficulties score (range: 0 to 40), which represents the severity and nature of the psychological issues. Based on the range of each subscale or total score, the SDQ score can be utilised as a continuous variable (total score) or classified as normal, borderline, or abnormal. As reported by Scott and Goodman, 1999 that SDQ was better than CBCL at detecting internalizing and externalizing behaviours.

Biochemical measures

The following laboratory tests were requested from all subjects in the study

Complete blood count (CBC)
Urine and stool analysis
Radiological assessment

X-ray of lumbosacral spine was requested from all subjects in the study to exclude other possible organic causes of primary enuresis (eg.spina bifida)

Procedure

Participants passed through 2 stages:

1. The first stage: All subjects were interviewed and diagnosed as having nocturnal enuresis according to DSM5 diagnostic criteria. Children with other psychiatric diagnoses were also enrolled in the study. Assessment was done by a specialist of Psychiatry (Msc.). Children with history of delayed milestones or clinical signs of intellectual disability were excluded from the study. Parents were interviewed and they completed Arabic translated and validated version of parent-reported Strength and Difficulties Questionnaire(SDQ) for their children [13].
2. The second stage: Children were sent to the laboratory located in the Center of Social and Preventive Medicine, Cairo University for drawing venous blood samples from all subjects enrolled in the study. They were also sent for radiological assessment (X-ray lumbosacral spine).

Statistical Evaluation

The data were analysed using the Statistical Package of Social Science (SPSS) (version 26). The normality of the data was tested using the Kolmogorov-Smirnov single-sample test. Numerical data were presented as mean and standard deviation or median and range. Comparison between two groups for numerical variables was done using Mann-Whitney test. Comparison between more than two groups for numerical variables was done using Kruskal-wallis test. Spearman correlation was used to correlate continuous data. Qualitative data were described as frequency and percentage. Chi-square was used to examine the relation between qualitative variables as appropriate. p- Value < 0.05 was considered significant

Results

The current study included 200 children with primary nocturnal enuresis. The mean age of the participants was 8.6±2.3 years, ranging from five to fourteen years. 74.5% of the participants were between 5-10 years, 100 females (50%), and 50 males (50%). Almost all of caregivers for children's care were mother (84.0%) followed by fathers (9.5%), while other family members like grandfather, grandmother and aunt represent only 6.5 %. Associated comorbidity was detected in 18% of the participants, for those who had comorbidity about two third suffer

from ADHD and 33.3% suffer from anxiety and depression. Positive family history was reported in more than half of patients (53.5%). Positive consanguinity were reported in about one third of the participants (35.5%). Normal urine analysis was found in 89.5%. Only 4% of children's suffer from anemia (Table 1).

Table1: The sociodemographic characteristics of the participants

Characteristic	Total (n= 200)
Age (years)	
Mean ± SD	8.6±2.3
Median (range)	8.5 (5-14)
Age groups	
5 – 10	149 (74.5%)
> 10	51 (25.5%)
Sex	
Female	100 (50.0%)
Male	100 (50.0%)
Care caver	
Mother	168 (84.0%)
Father	19 (9.5%)
Others*	13 (6.5%)
Associated comorbidity	
No	164 (82.0%)
Yes	36 (18%)
Type of comorbidity (n=36)	
ADHD	24 (66.8%)
Anxiety and depression	12 (33.3%)
Family history	
Negative	93 (46.5%)
Positive	107 (53.5%)
Consanguinity	
Negative	129 (64.5%)
Positive	71 (35.5%)
Urine analysis**	
Normal	179 (89.5%)
Abnormal	21 (10.5%)
Blood tests	
Normal	192 (96.0%)
Anaemia	8 (4.0%)

* Others includes: grandfather, grandmother and aunt, ** abnormal urine analysis includes pus cells, ca oxalate and hyaline cast

Table 2 showing the behavioral assessment classification and scores of the participants, as regard emotional scale 37% of the participant fall in abnormal category, the median emotion score was six ranging from (0-10). About one third of the participant (35.5%) were classified as abnormal on conduct scale, the median conduct score was four ranging from (0-10). 41%were classified abnormal as regard hyperactivity inattention. While more than one third of the participants

(34%) reported abnormal regarding total difficulties score, the median total difficulties score was 16 ranging from (0-31). Nonetheless regarding prosocial behavior 17% of the participants were considered abnormal.

Table 2: The behavioural assessment classification and scores of the participants

				Score
Behavioral assessment (SDQ subscales)		N	%	Median (Range)
Emotional symptoms	Normal (0 - 5)	82	41%	6 (0-10)
	Borderline (6)	44	22%	
	Abnormal (7 - 10)	74	37%	
Conduct symptoms	Normal (0 - 3)	99	49.5%	4 (0-10)
	Borderline (4)	30	15%	
	Abnormal (5 - 10)	71	35.5%	
Hyperactivity inattention symptoms	Normal (0 - 5)	94	47%	6 (0-10)
	Borderline (6)	24	12%	
	Abnormal (7 - 10)	82	41%	
Peer relationship problems	Normal (0 - 3)	141	70.5%	2 (0-10)
	Borderline (4 - 5)	39	19.5%	
	Abnormal (6 - 10)	20	10.0%	
Total difficulties score	Normal (0 - 15)	86	43%	16 (0-31)
	Borderline (16 - 19)	46	23%	
	Abnormal (20 - 40)	68	34%	
Prosocial behavior	Normal (6-10)	157	78.5%	8 (0-10)
	Borderline (5)	9	4.5%	
	Abnormal (0-4)	34	17%	

Table 3 shows Relation between behavioral of scores and sociodemographic characteristics: Males had a significantly greater average Hyperactivity-inattention Score than females (6.5 vs. 4.5; p-value < 0.001). Regarding caregiver reporting the case mother tended more to address a significantly higher Conduct symptoms, Peer relationship problems and median total difficulties score than those who were reported by their fathers (p-value 0.030; <0.001 and 0.003 respectively). Children suffer from anxiety and depression had a significantly higher Peer relationship problems score than those suffer from ADHD (4.5 vs. 2; p-value < 0.016). In addition anemic patients had had a significantly higher Emotional symptoms; Hyperactivity-inattention symptoms and Total score than non-anemic patients (p-value 0.012; <0.040 and 0.012 respectively). A statistically significant negative association was found between Conduct symptoms; Peer-relationship problems; Total difficulties score and Prosocial behavior (p<0.001).

Table 3: Relation between behavioural of scores and sociodemographic characteristics

Characteristic	Emotional symptoms	Conduct symptoms	Hyperactivity-inattention symptoms	Peer relationship problems	Total score	Prosocial behavior
Age groups						

5 – 10	6 (0-10)	3 (0-10)	6 (0-10)	2 (0-10)	16 (3-31)	8 (0-10)
> 10	6 (0-10)	4 (0-10)	4 (0-10)	2 (0-10)	17 (0-30)	8 (0-10)
p- value	0.404	0.875	0.078	0.484	0.595	0.809
Sex						
Female	6 (0-10)	3(0-9)	4.5 (0-10)	2 (0-10)	16 (0-31)	8 (2-10)
Male	6 (0-10)	4 (0-10)	6.5 (0-10)	2 (0-10)	17 (0-31)	8 (0-10)
p- value	0.396	0.218	<0.001	0.804	0.077	0.051
Care caver						
Mother	6 (0-10)	4 (0-10)	6 (0-10)	2 (0-10)	17 (0-31)	8 (0-10)
Father	6 (0-8)	3 (0-5)	5 (2-10)	0 (0-3)	14 (6-25)	9 (2-10)
Others	3 (0-10)	4 (0-10)	4 (0-10)	2 (0-10)	11 (3-27)	9 (0-10)
p-value	0.118	0.030	0.461	<0.001	0.003	0.181
Associated comorbidity						
No	6 (0-10)	3 (0-10)	6 (0-10)	2 (0-10)	16 (0-31)	8 (0-10)
Yes	6 (0-10)	4 (0-10)	6 (1-10)	3 (0-7)	17 (8-30)	7 (0-10)
p-value	0.973	0.061	0.153	0.136	0.154	0.072
Type of comorbidity						
ADHD	5 (0-10)	4.5 (0-10)	6.5 (3-10)	2 (0-6)	16.5 (8-30)	7.5 (0-10)
Anxiety and depression	7.5 (4-10)	4 (0-9)	6 (1-9)	4.5 (0-7)	17 (12-30)	6 (0-10)
p-value	0.053	0.280	0.166	0.016	0.655	0.882
Family history						
Negative	6 (0-10)	3 (0-10)	6 (0-10)	2 (0-10)	17 (0-30)	8 (0-10)
Positive	6 (0-10)	4 (0-9)	5 (0-10)	2 (0-10)	16 (6-31)	8 (0-10)
p-value	0.085	0.169	0.122	0.417	0.771	0.365
Consanguinity						
Negative	6 (0-10)	3 (0-10)	6 (0-10)	2 (0-10)	16 (3-31)	8 (0-10)
Positive	6 (0-10)	4 (0-9)	5 (0-10)	2 (0-10)	16 (0-31)	8 (0-10)
p-value	0.055	0.113	0.424	0.545	0.837	0.589
Urine analysis**						
Normal	6 (0-10)	4 (0-10)	6 (0-10)	2 (0-10)	16 (0-31)	8 (0-10)
Abnormal	6 (0-10)	2 (0-8)	5 (0-10)	2 (0-10)	17 (3-28)	8 (4-10)
p-value	0.378	0.205	0.513	0.377	0.944	0.649
Blood tests						
Normal	6 (0-10)	3 (0-10)	6 (0-10)	2 (0-10)	16 (0-31)	8 (0-10)
Anemia	8.5 (0-10)	4.5 (2-9)	7 (5-10)	4 (0-6)	24 (14-31)	8.5 (2-10)
p-value	0.012	0.177	0.040	0.094	0.012	0.683

Discussion

In this study the mean age was 8.6±2.3 years with a prevalence 50% boys and 50% girls being higher in girls than boys, which is consistent with French and Scandinavian studies[16],[17] however it was contradictory with other Malaysian and Turkish studies which showed marked increase in the prevalence among boys than girls [18],[19].This can be attributed to the fact that parents are more reluctant to teach boys toilet training and behavioral instructions than girls.

It's worthy to note that in Egyptian studies it was found that the prevalence rate is equal among girls and boys [20],[21],[12], as well as [22], however these studies screened for nocturnal enuresis in schools.

In our study it didn't assess the prevalence of nocturnal enuresis among normal childhood population, as children were recruited from Abo El Reesh pediatric clinics that act as a large encashment area for child psychiatric services. This reflects the parental concerns in our culture that girls are not accepted for having bed wetting problems as boys because its combined with feelings of shame and blame.

It was noted in this study that the majority of caregivers (84.0%%) for children were mothers while 9.5% of them were fathers, which is consistent with most studies that report that mothers are easier to approach healthcare facilities for children than fathers, as Stahlschmidt et al.[23] study which implemented parenting programs for caregivers and noted the reluctance of fathers to join healthcare facilities for them and their children, adding on specially in the Egyptian culture where boys and men are raised that the masculinity and power is to hide their pain and feelings and to deny them, which is consistent with Addis [24], who also noted that men's painful emotions are actively concealed and invisible.

In terms of caregiver reporting, the mother of the case was more likely to mention Conduct symptoms, peer relationship issues, and a median total challenges score than their fathers (p-values 0.030; 0.001 and 0.003, respectively). Fält et al (25)on their study to compare responses on SDQ scales between fathers and mothers with their correlation to teachers reports. They discovered that the agreement between mother and teacher ratings was higher than the agreement between father and teacher ratings for conduct, hyperactivity, and overall difficulty. Because of this, it is not all that surprising that many studies on young children that use mothers as informants (26), (27). Because most instruments were created and standardised for women, using them with fathers can occasionally cause issues. When data were analysed without dads as opposed to with fathers ($r = 0.17$), there was a stronger correlation ($r = 0.19$) in a prior study on the inter-rater agreement of behaviour problems in young children. This is likely due to the paucity of dads as informants in the literature (26), but it does not imply that fathers are less trustworthy as informants (27). It might also be a reflection of different parental roles, with moms perhaps spending more time with the kids or interacting with the preschool teachers(28), particularly when the kids are young. Adding to this is the Egyptian culture, where people seeking medical attention at government hospitals are more likely to be housewives and have low socioeconomic statuses and illiterate mothers. This is because part of male dominance and masculinity is working hard to provide for one's family. About one third of the participant (35.5%) were classified as abnormal on conduct scale, the median conduct score was four ranging from (0-10). 41%were classified abnormal as regard hyperactivity inattention. While more than one third of the participants (34%) reported abnormal regarding total difficulties score, the median total difficulties score was 16 ranging from (0-31)

Males had a significantly greater average Hyperactivity-inattention Score than females (6.5 vs. 4.5; p-value < 0.001). Regarding caregiver reporting the case mother tended more to address a significantly higher Conduct symptoms, Peer relationship problems and median total difficulties score than those who were reported by their fathers (p-value 0.030; <0.001 and 0.003 respectively)

This can be explained by the tendency of parents in Egyptian culture to blame girls more than boys for bed wetting and being stigmatized for that causing more internalized problems that affected their sociability. These findings were in line with a study from Egypt by Hamed et al., which revealed that children with enuresis had higher frequencies of emotional, conduct, hyperactivity-inattention symptoms, abnormal peer relationships, and prosocial problems than healthy children, in addition to higher total and individual subscale SDQ scores, when compared to healthy children. It also revealed that while girls had more severe internalising issues, boys had more severe conduct symptoms (P = 0.036) and prosocial issues (P = 0.032) than girls. (29). Our findings concurred with those of studies conducted in other nations examining the relationship between nocturnal enuresis and behavioural issues in kids(29),(30),(31) (32)

The relationship between nocturnal enuresis and behavioural issues (hyperactivity, attentiveness, and social issues) has been concluded, and both externalising and internalising issues have been demonstrated. One of the advantages of this study is that it was carried out in the preventive medicine department of AbuElReesh hospital, which is a part of AlKasrAlAiny hospital, which serves as a large catchment area for all of Egypt. This provided a sample that was representative of various segments of the Egyptian population. However, the study contains certain drawbacks, such as: The findings were primarily based on interviews with parents and reports from parents, not from reports from children.

Limitations

Lack of a control group and inability to assess how behavioural abnormalities may affect children's quality of life in the long run

Conclusion

These findings highlight the significance of taking into account these children's co-occurring behavioural and mental health issues and addressing them in their treatment plan in order to provide a higher standard of living for these kids and their families.

Conflict of interest

No pertinent conflicts of interest exist; hence nothing needs to be disclosed.

Contributions to the writing

Reham K.; Data gathering, protocol creation, and manuscript writing. Data analysis by Walaa A. Dina Y; drafting manuscripts and developing protocols.

Acknowledgements

The researchers would like to thank the kids who took part in the study as well as their parents for giving up their time andFunding: The whole research was funded by the authors without any external funds or grants.

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