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Urinary Incontinence among Children in Saudi Arabia

Zakia Salman Kadhem[1]*, Alawyah Adnan Alshkhouri[2], Aqeelah Salman Alfaraj[3], Fatimah Hussain Alsalem[3], Yara Suleiman Alsulami[2], Mariam Talib Alqassab[4], Sarah Ibrahim Al Ibrahim[5], Zahra Mahdi Aldahan[4], Zahra Mohammed Tahifa[2] and Sajeda Youssef Alnejedi[6]

[1]Pediatrician and Pediatric Neurologist Consultant, QCH, Alqatif, Saudi Arabia

[2]Medical Student, Alfarabi College of Medicine, Alfarabi Colleges, Riyadh, Saudi Arabia

[3]Medical Student, College of Medicine, Imam Abdulrahman Bin Faisal University, Dammam, Saudi Arabia

[4]Medical Student, Alfaisal College of Medicine, Alfaisal University, Riyadh, Saudi Arabia

[5]Medical Student, Medical University of Warsaw, Warsaw, Poland

[6]Medical Intern, Alfarabi College of Medicine, Alfarabi Colleges, Riyadh, Saudi Arabia

***Corresponding Author:** Zakia Salman Kadhem, Pediatrician and Pediatric Neurologist Consultant, QCH, Alqatif, Saudi Arabia.

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Abstract

Background: Urinary incontinence UI (enuresis) is the symptom of involuntary urine loss which is a multidisciplinary and interdisciplinary problem. It is the commonest urinary symptom in children and adolescents and can lead to a long-term distress for the affected children and their parents. Incontinence is typically not diagnosed until 5 to 6 years of age. The age limit is focused on children who normally develop and thus will not be applicable to children with developmental retardation.

Objective: This study is conducted to determine the prevalence, risk factors and symptoms associated with urinary incontinence among Saudi children.

Methods: A community based cross-sectional study was conducted in different regions of Saudi Arabia from the period of 1 May to 30 August 2020. Study population included randomly selected participants (male and female Saudi children under 13 years old. Data was analyzed using statistical package for the social sciences (SPSS, version 16) and results were analyzed with frequencies and Chi-squared test as appropriate. P value was considered significant if < 0.05.

Results: 37.4% of children suffer from urinary incontinence. More than half of case 67.4% reported that they have UI only during sleep, 20.1% during sleep and waking up (most of the time) and 12.5% had UI during waking up. 15% reported that urinary incontinence problem increase with age. Only 5.1% reported that children suffer from pain during urination and 14.6% reported stomach or pelvic pain. 15.1% reported urine leakage occur during coughing or sneezing. 13.2% was previously diagnosed with a urinary tract disease or infection, 6.4% had family history with parents suffering from incontinence, 4.7% of children have nerve problems, 4.2% have muscle problems and 13.7% of children undergone a surgery before.

Conclusion: There is significant association between UI with child age and child gender which was more prevalent among male gender. Also, there is significant correlation between UI and age of mother and father of child, educational level of father and mother, the standard of living and if one of the parents or another child in the family suffer from the problem of enuresis.

Keywords: *Urinary Incontinence; Enuresis; Urinary Incontinence in Children; Nocturnal Enuresis*

Introduction

Urinary incontinence UI (enuresis) is the symptom of involuntary urine loss which is a multidisciplinary and interdisciplinary problem. It is the commonest urinary symptom in children and adolescents and can lead to a long-term distress for the affected children and their parents [1]. The International Continence Society defined UI as the complaint of any involuntary leakage of urine [2]. Daytime

urinary incontinence (often know as diurnal enuresis) is also described according to the Diagnostic and Statistical Manual for Mental Disorders as excessive urinary emptying during the day, with a frequency of at least twice a week among in children older than 5 years of age in absence of congenital or acquired defects in central nervous system with frequency ranges from 2% to 20% [3].

There are three major forms of urinary incontinence: stress incontinence and urgency incontinence. Stress incontinence is a complaint of leakage of urine associated with coughing, sneezing, or physical exercise, while urgent incontinence is a complaint of leakage of urine associated with a sudden, compelling desire for void that is difficult to defer [4]. Urinary incontinence urges causes acute compulsion signs, or pollakiuria, voiding more than seven hours a day (depending on the amount of fluid intake), small urination quantities, and retaining maneuvers [5]. Overflow urinary incontinence is associated with poor bladder emptying in which the patient may endorse straining [6].

Risk factors can include medical disorders such as chronic obstructive pulmonary disease and asthma which may induce cough, heart failure with associated fluid pressure and diuresis, neurological problems which may indicate dysregulated bladder innervation or musculoskeletal conditions which may lead to toilet barriers [6]. Also some medication can be counted as risk for incontinence such as diuretics, alcohol, and caffeine as they can either directly or indirectly through adverse effects include impairment of cognition, alteration of bladder tone or sphincter function, inducement of cough, promotion of diuresis [7]. Many behaviors can lead to incontinence during the day, particularly in girls as urinating infrequently and with legs too close together which makes urine collect in the vagina during urination, and then dribble out after standing. Some girls suffer bladder spasm as they chuckle, which results in "giggle incontinence" [8]

Behavioral comorbidities should always be taken into account. If behavioral comorbidities are identified, further counseling is recommended [9]. Incontinence is typically not diagnosed until 5 to 6 years of age. The age limit is focused on children who normally develop and thus will not be applicable to children with developmental retardation. Nocturnal and diurnal incontinence are symptoms not diagnoses which require consideration of the underlying trigger [10].

Treatment and management depend on the type of urinary incontinence [11]. There are conservative, pharmacological and surgical modalities. In order to prevent urine from leaking, children with incontinence should learn to cross their legs or to use other positions, such as squatting with a hand or a heel pressed between their legs. Medications should be reconciled and drugs such as caffeine and alcohol should be stopped because they lead to incontinence. The response to care and management varies among children [12].

There are no available published data with the same objective as our study about urinary incontinence among children but a previous study was carried out among Saudi children, 3 - 12 years of age to show the prevalence, risk factors, types of provided treatment of enuresis among studied children which reported that; 31.2% of children suffered from enuresis, the majority occurred at day and night by 55.1% while 43.9% occurred only at night. There was a significant reduction of the prevalence of NE with age (peak is 63.6% in 5 - 7 years old) but no significant correlation was found with gender ($p = 0.104$). However, there was a significant correlation with parent having history of NE ($p = 0.001$) [13].

Aim of the Study

This study is conducted to determine the prevalence, risk factors and symptoms associated with urinary incontinence among Saudi children.

Methods

Study design and participants: A cross-sectional study was conducted in different regions of Saudi Arabia conducted from the period of 1 May to 30 August 2020. This study included randomly selected participants (male and female Saudi children under 13 years old).

Data collection: A multistage stratified random sampling technique was followed for data collection by a pre-designed online questionnaire distributed among mothers and children which filled by them after a brief introduction or explanation of the idea of the research to mothers and children. Children and mothers filled out the predesigned questionnaire to collect demographic and socioeconomic data including:

- Socio-demographic characteristics of the participants including age, sex and educational level of child.
- If the patient has urinary incontinence.
- Questions about risk factors of incontinence among children and frequency of enuresis during daytime and bedtime.
- Questions about psychological effect on child.
- Questions about medical help seeking and management of diagnosed children.

Statistical analysis

Data was analyzed using statistical package for the social sciences (SPSS, version 15). Descriptive statistics for the prevalence and quantitative variables was used. Relation between urinary incontinence and sociodemographic characters of children and other risk factors was determined using A 2-sided p-value of less than 0.05 will be considered statistically significant.

Ethical considerations

This study will be reviewed and approved From King Fahd Medical City in Saudi Arabia. Participants will be informed that participation is completely voluntary and data collectors will introduce and explain the research to participants. No names will be recorded on the questionnaires and all questionnaires will be kept safe.

Results

Looking at table 1 illustrating sociodemographic characters of participants: we found that 57.9% of children were males, 51.1% of children aged between 5 - 7 years old, 52.3% had very good living standard, 51.1% of fathers and 58.5% of mothers went to university and 92.1% of fathers and 44.6% of mothers were working.

Table 2 shows that; 32.6% of studied children had 1st arrangement between their siblings, 23.6% of children had 2 siblings and 37.4% of children suffer from urinary incontinence.

Table 3 discuss characteristics of studied cases of urinary incontinence reporting that; more than half of case 67.4% reported that they have UI only during sleep, 20.1% during sleep and waking up (most of the time) and 12.5% had UI during waking up. Regarding age the child started learns using the bathroom; 59.8% reported 2- 3 years. 15% reported that urinary incontinence problem increase with age,

	Frequency	Percent	
Child Gender			
Male	962	57.9	
female	700	42.1	
Child Age			
5 - 7		850	51.1
7 - 12		640	38.5
12 or more		172	10.3
Age of father			
20 or less		17	1.0
21 - 30		163	9.8
31 - 40		647	38.9
41 - 50		587	35.3
51 or more		248	14.9
Age of mother			
20 or less		15	.9
21 - 30		447	26.9
31 - 40		678	40.8
41 - 50		463	27.9
51 or more		59	3.5
The standard of living			
Weak	23	1.4	
Good	392	23.6	
very good	870	52.3	
Excellent	377	22.7	
Educational level of father			
uneducated	26	1.6	
primary	46	2.8	
Intermediate	106	6.4	
Secondary	425	25.6	
University	850	51.1	
More than University	209	12.6	
Educational level of mother			
uneducated	25	1.5	
primary	29	1.7	
Intermediate	67	4.0	
Secondary	401	24.1	
University	972	58.5	
More than University	168	10.1	

Father working status			
Work	1530	92.1	
No Work	132	7.9	
Mother working status			
Work	742	44.6	
No Work	920	55.4	

Table 1: *Sociodemographic characters of the studied population N = 2338.*

	Frequency	**Percent**
The arrangement of the child among his siblings?		
1	541	32.6
2	367	22.1
3	278	16.7
4	204	12.3
5	113	6.8
6	89	5.4
7	33	2.0
8	19	1.1
9	18	1.1
How many siblings?		
1	252	15.2
2	392	23.6
3	351	21.1
4	255	15.3
5	147	8.8
6	59	3.5
7	38	2.3
8	27	1.6
9	31	1.9
No siblings	110	6.6
With whom the child lives?		
The father	9	.5
The mother	51	3.1
Mother and father	1581	95.1
Other	21	1.3
Does your child suffer from urinary incontinence?		
Yes	622	37.4
No	1040	62.6

Table 2: *Arrangement of child, number of siblings and prevalence of urinary incontinence (N = 2663).*

How does your child suffer from urinary incontinence?		
During waking up	78	12.5
Only during sleep	419	67.4
During sleep and waking up (most of the time)	125	20.1
age the child started learn using the bathroom		
Less than 2 year	105	16.9
2 -3 year	372	59.8
3 - 4 year	122	19.6
More than 4 year	23	3.7
if child's age have a relationship with the problem of incontinence		
It increases with age	93	15.0
Decrease with age	222	35.7
It has no relationship	307	49.3
Does urine leakage occur during coughing or sneezing?		
Yes	94	15.1
No	528	84.9
Does your child suffer from pain during urination?		
Yes	32	5.1
No	576	92.6
Sometimes	14	2.2
How often during the week does your child urinate involuntarily?		
1 - 2	255	41.0
3 - 4	206	33.1
5 or more	161	25.9
Does the child complain of other pain such as stomach or pelvic pain?		
Yes	91	14.6
No	531	85.4
How often does urine leak when your child is asleep?		
Never	97	15.6
Once a day	71	11.4
Several times a day	25	4.0
Once or less a week	125	20.1
More than once a week	226	36.3
Continuously	78	12.5
How often does your child leak urine for no apparent reason when he is awake?		
Never	341	54.9
Once a day	40	6.4
Several times a day	49	7.8
Once or less a week	101	16.2
More than once a week	75	12.1
continuously	16	2.6
How often does a child urinate normally during the day?		
1 - 4	349	56.1
5 - 8	209	33.6
9 - 12	23	3.7
13 or more	15	2.4
Does urinary incontinence occur during daily activities or with psychological stress?		
Yes	165	26.5
No	427	68.6
Sometimes	30	4.9

Table 3: *Characteristics of studied cases of urinary incontinence (N = 760).*

35.7% said it decreases with age and 49.3% found no relation between age and urinary incontinence problem. Only 5.1% reported that children suffer from pain during urination and 14.6% reported stomach or pelvic pain. 15.1% reported urine leakage occur during coughing or sneezing. 36.3% said that urine leak when child is asleep more than once a week and 12.1% child leak urine for no apparent reason when he is awake more than once a week.

Table 4 discussing risk factors and causes of urinary incontinence among studied cases reporting that; 13.2% was previously diagnosed with a urinary tract disease or infection, 3.5% diagnosed with autism, 9.6% had disease since birth, 6.4% had family history with parents suffering from incontinence, 5.9% of children have diabetes, 22.2% of cases have another child in the family suffering from enuresis, 4.7% of children have nerve problems, 4.2% have muscle problems and 13.7% of children undergone a surgery before.

Has the child been previously diagnosed with a urinary tract disease or infection?		
Yes	82	13.2
No	540	86.8
Has your child ever been diagnosed with autism?		
Yes	22	3.5
No	600	96.5
Is the child undergoing emotional stress or fear?		
Yes	71	11.4
No	223	35.9
Sometimes	251	40.4
I do not know	77	12.4
Are there family problems?		
Yes	64	10.3
No	386	62.1
Sometimes	172	27.7
Are there diseases in the child from birth?		
Yes	60	9.6
No	562	90.4
Does one of the parents suffer from the problem of incontinence?		
Yes	40	6.4
No	502	80.7
I do not know	80	12.9
Has your child ever been diagnosed with diabetes?		
Yes	37	5.9
No	585	94.1
Has your child recently had a sibling or introduced a new child in the family?		
Yes	272	43.7
No	350	56.3
Does your child snore or have a nosebleed?		
Yes	155	
No	467	75.1
Does the child suffer from chronic or frequent constipation?		
Yes	110	17.7
No	507	81.5
Sometimes	5	.8
Is there another child in the family suffering from enuresis?		
Yes	138	22.2
No	476	76.5
I do not know	8	1.3
Does the child drink a lot of fluids during the day?		
Yes	411	66.1
No	198	31.8
Sometimes	13	2.1
Was a parent suffering from incontinence during my childhood?		
The father	47	7.6
The mother	55	8.8
Both of them	25	4.0
No one	276	44.4

I do not know	219	35.2
Have you noticed that your child has difficulty in awareness, concentration?		
Yes	142	22.8
No	461	74.1
Sometimes	19	3.1
Does your child have difficulties interacting with society or leaving the home?		
Yes	119	19.1
No	484	77.8
Sometimes	19	3.1
Does your child suffer from psychological problems such as depression or anxiety?		
Yes	93	15.0
No	513	82.5
Sometimes	16	2.6
Is the child being bullied because of this problem?		
Yes	126	20.3
No	479	77.0
Sometimes	17	2.7
Does the child have an itch or rash in the genital area?		
Yes	65	10.5
No	539	86.7
Sometimes	18	2.8
Does the child suffer from a chest crisis or breathing problems?		
Yes	72	11.6
No	550	88.4
Does the child suffer from heart problems?		
Yes	16	2.6
No	606	97.4
Does the child suffer from nerve problems?		
Yes	29	4.7
No	593	95.3
Does the child suffer from muscle problems?		
Yes	26	4.2
No	596	95.8
Has the child had undergone surgery before?		
Yes	85	13.7
No	537	86.3
Does the child take any of the following medicines?		
Caffeine and its derivatives	19	3.1
Alcohol	6	1.0
He does not take the medicines mentioned above	583	93.7
Diuretics	14	2.3
Does the child suffer from chronic constipation?		
Yes	58	9.4
No	564	90.6
Does the child suffer from a congenital anomaly in the urinary tract?		
Yes	18	2.9
No	604	97.1
How does this topic affect your child's daily activity with his peers?		
His activity was greatly affected	27	4.3
Little affected	197	31.7
It never affects	399	64.0
Does the child feel guilt and embarrassment?		
Yes	365	58.7
No	229	36.8
Sometimes	28	4.5

Table 4: *Risk factors and causes of urinary incontinence among studied cases (N = 760).*

Table 5 regarding seeking medical care and treatment outcomes; our study found that only 31% of cases asked for medical help to solve this problem before, the majority from them 94.8% went to urologist. 47.2% of child dispensed treatment, improvement was noticed in 43.5% of child with treatment.

Have you been resorting to medical aid to solve this problem before?		
Yes	193	31.0
No	429	69.0
N (278)		
If the answer is yes, have you been resorting to		
Urologist	183	94.8
Psychologist	10	5.2
Was a treatment dispensed to the child?		
Yes	91	47.2
No	102	52.8
Did you notice an improvement in the child's condition with treatment?		
Yes	84	43.5
No	79	40.9
Gets better and then come back	30	15.5

Table 5: *Seeking medical care and treatment outcomes.*

Table 5 regarding seeking medical care and treatment outcomes; our study found that only 31% of cases asked for medical help to solve this problem before, the majority from them 94.8% went to urologist. 47.2% of child dispensed treatment, improvement was noticed in 43.5% of child with treatment.

		Does your child suffer from urinary incontinence?		**Total (N=1662)**	**P value**
		Yes	**No**		
Child Age	5 - 7	294	556	850	0.046
		47.3%	53.5%	51.1%	
	7 - 12	256	384	640	
		41.2%	36.9%	38.5%	
	12 or more	72	100	172	
		11.6%	9.6%	10.3%	
Age of father	20 or less	6	11	17	0.848
		1.0%	1.1%	1.0%	
	21-30	56	107	163	
		9.0%	10.3%	9.8%	
	31-40	248	399	647	
		39.9%	38.4%	38.9%	
	41-50	215	372	587	
		34.6%	35.8%	35.3%	
	51 or more	97	151	248	
		15.6%	14.5%	14.9%	
Age of mother	20 or less	7	8	15	0.416
		1.1%	0.8%	0.9%	
	21-30	171	276	447	
		27.5%	26.5%	26.9%	
	31-40	263	415	678	
		42.3%	39.9%	40.8%	
	41-50	157	306	463	
		25.2%	29.4%	27.9%	
	51 or more	24	35	59	
		3.9%	3.4%	3.5%	

Educational level of father	Uneducated	15	11	26	0.0001
		2.4%	1.1%	1.6%	
	primary	31	15	46	
		5.0%	1.4%	2.8%	
	Intermediate	62	44	106	
		10.0%	4.2%	6.4%	
	Secondary	196	229	425	
		31.5%	22.0%	25.6%	
	University	264	586	850	
		42.4%	56.3%	51.1%	
	More than University	54	155	209	
		8.7%	14.9%	12.6%	
Educational level of mother	Uneducated	12	13	25	0.0001
		1.9%	1.3%	1.5%	
	Primary	24	5	29	
		3.9%	0.5%	1.7%	
	Intermediate	37	30	67	
		5.9%	2.9%	4.0%	
	Secondary	206	195	401	
		33.1%	18.8%	24.1%	
	University	314	658	972	
		50.5%	63.3%	58.5%	
	More than University	29	139	168	
		4.7%	13.4%	10.1%	
The standard of living	Weak	12	11	23	0.062
		1.9%	1.1%	1.4%	
	Good	162	230	392	
		26.0%	22.1%	23.6%	
	very good	322	548	870	
		51.8%	52.7%	52.3%	
	Excellent	126	251	377	
		20.3%	24.1%	22.7%	
Child Gender	Male	386	576	962	0.008
		62.1%	55.4%	57.9%	
	Female	236	464	700	
		37.9%	44.6%	42.1%	
The arrangement of the child among his siblings	1	169	372	541	0.0001
		27.2%	35.8%	32.6%	
	2	175	192	367	
		28.1%	18.5%	22.1%	
	3	94	184	278	
		15.1%	17.7%	16.7%	
	4	65	139	204	
		10.5%	13.4%	12.3%	
	5	48	65	113	
		7.7%	6.3%	6.8%	
	6	40	49	89	
		6.4%	4.7%	5.4%	
	7	17	16	33	
		2.7%	1.5%	2.0%	
	8	6	13	19	
		1.0%	1.3%	1.1%	
	9	8	10	18	
		1.3%	1.0%	1.1%	

Who does the child live with?	Father	1	8	9	.075
		0.2%	0.8%	0.5%	
	Mother	22	29	51	
		3.5%	2.8%	3.1%	
	Both of them	587	994	1581	
		94.4%	95.6%	95.1%	
	Other	12	9	21	
		1.9%	0.9%	1.3%	
Does one of the parents suffer from the problem of enuresis?	Yes	40	1	41	.0001
		6.4%	0.1%	2.5%	
	No	502	85	587	
		80.7%	8.2%	35.3%	
	I do not know	80	954	1034	
		12.9%	91.7%	62.2%	
Is there another child in the family suffering from enuresis	Yes	138	1	139	.0001
		22.2%	0.1%	8.4%	
	No	476	86	562	
		76.5%	8.3%	33.8%	
	I do not know	8	953	961	
		1.3%	91.6%	57.9%	

Table 6*: Relation between urinary incontinence and sociodemographic characters of child and other important variables.*

Coming to table 6 showing relation between urinary incontinence and sociodemographic characters of child and other important variables; we found that there was significant association between UI with child age and child gender ($P < 0.05$), it was more prevalent among 5 - 7 age group child and among males. Also, the study reported significant correlation between UI and educational level of father and mother and if one of the parents or another child in the family suffer from the problem of enuresis (< 0.05).

Discussion

Urinary incontinence (bedwetting, enuresis) is a pediatric problem. It is the commonest urinary symptom in children and adolescents and can lead to major distress for the affected children and their parents [1]. The definition of urinary incontinence (UI) is the complaint of involuntary loss of urine [14]. The daytime incontinence is defined as a functional urinary incontinence that is also known as involuntary voiding of urine while awake, whereas the occurrence of intermittent continence during sleep is known as nocturnal enuresis [15]. Daytime urinary incontinence is more common than night incontinence. While incontinence does not lead to death, it can have a profound effect on quality of life comparable to that of stroke, arthritis and chronic-obstructive pulmonary disease [16]. This is a cross-sectional study was conducted among 2338 of selected participants (male and female Saudi children between 5 - 13 years old) from different regions of Saudi Arabia. The study aimed to determine the prevalence, risk factors and symptoms associated with urinary incontinence among Saudi children. Generally, the incidence of incontinence in childhood is high. According to prevalence of urinary incontinence in this study, we reported that 37.4% of children suffer from urinary incontinence. A recent study carried out in the UK reported a 15.5%

rate for UI in 7.5-year-old children, which decreased with age but remained at 0.5 - 1% in adults [17]. In Sydney, Australia, a population-based cross-sectional survey was carried out among 1419 of new entrant primary school children reported that the overall prevalence of UI among children was 19.2% [3]. Another study about UI showed that its UI was reported in 15% and 5% among 4.5 - 9.5 years old children, respectively [18]. Other studies reported a prevalence of UI ranges between 17% and 20% [19-21]. In Yemen, another study was conducted among 1061 subjects reported that only 3.2% of the studied children had UI [22].

The epidemiological studies have shown that 20 - 30% of children with night incontinence during sleep, 20 - 40% with daytime urinary incontinence [23]. Our study found that more than half of case 67.4% reported that they have UI only during sleep, 20.1% during sleep and waking up (most of the time) and 12.5% had UI during waking up. Another study reported; during sleep UI alone or combined day and night enuresis was found in the majority of cases and in all males compared to females (94.4%) [22].

Regarding to relation between having UI and different variables, our study found that there was significant association between UI with child age and child gender ($P < 0.05$), it was more prevalent among 5 - 7 age group child and among males. Also, the study reported significant correlation between UI and educational level of father and mother and if one of the parents or another child in the family suffer from the problem of enuresis (< 0.05). Another study reported that recent emotional stress (odds ratio 5.7), a history of daytime UI along the paternal line (odds ratio 9.3) and a history of UI among male siblings (odds ratio 5.3) were independent risk factors for moderate to severe daytime UI [3]. Results from another study showed that working mother, parent-reported history of any frightening, emotionally stressful events and birth order of the index child were significantly associated with daytime incontinence however, parents' education, punishment for daytime incontinence, and the presence of family history of incontinence were insignificant [22].

Our study found that only 31% of cases have been resorting to medical aid to solve this problem before, the majority from them 94.8% went to urologist. 47.2% of child dispensed a treatment; improvement was noticed in 43.5% of child with treatment. Another study demonstrates that only 16% of families with affected children had sought medical help which was less than our findings [3].

Conclusion

There is significant association between UI with child age and child gender which was more prevalent among male gender. Also, there is significant correlation between UI and age of mother and father of child, educational level of father and mother, the standard of living and if one of the parents or another child in the family suffer from the problem of enuresis.

Bibliography

1. Schultz-Lampel D., *et al*. "Urinary incontinence in children". *Deutsches Ärzteblatt International* 108.37 (2011): 613-620.

2. Nevéus T., *et al*. "Evaluation of and treatment for monosymptomatic enuresis: a standardization document from the International Children's Continence Society". *The Journal of Urology* 183 (2010): 441-447.

3. Sureshkumar P., *et al*. "Daytime urinary incontinence in primary school children: a population-based survey". *The Journal of Pediatrics* 137 (2000): 814-818.

4. Abrams P., *et al*. "Standardisation Sub-Committee of the International Continence Society. The standardisation of terminology in lower urinary tract function: report from the standardisation sub-committee of the International Continence Society". *Urology* 61.1 (2003): 37-49.

5. Khandelwal C and Kistler C. "Diagnosis of urinary incontinence". *American Family Physician* 87.8 (2013): 543-550.

6. Maternik M., *et al*. "The management of childhood urinary incontinence". *Pediatric Nephrology* 30.1 (2015): 41-50.

7. Abrams P., *et al*. "Fourth international consultation on incontinence recommendations of the international scientific committee: Evaluation and treatment of urinary incontinence, pelvic organ prolapse, and fecal incontinence". *Neurourology and Urodynamics* 29 (2010): 213-240.

8. Hu JS and Pierre EF. "Urinary Incontinence in Women: Evaluation and Management". *American Family Physician* 100.6 (2019): 339-348.

9. Hoebeke P., *et al*. "Diagnostic evaluation of children with daytime incontinence". *The Journal of Urology* 183 (2010): 699-703.

10. Dt Ges F. "Kinder- und Jugendpsychiatrie und Psychotherapie Leitlinien zur Diagnostik und Therapie von psychischen Störungen im Säuglings-, Kindes- und Jugendalter. Deutscher Ärzte Verlag. Köln: 2007". *Enuresis und funktionelle Harninkontinenz* (2007): 327-342.

11. Subak LL., *et al*. "The effect of behavioral therapy on urinary incontinence: a randomized controlled trial". *Obstetrics and Gynecology* 100.1 (2002): 72-78.

12. Riemsma R., *et al*. "Can incontinence be cured? A systematic review of cure rates". *BMC Medicine* 15.1 (2017): 63.

13. Alhifthy EH., *et al*. "Prevalence of Nocturnal Enuresis among Saudi Children Population". *Cureus* 12.1 (2020): e6662.

14. Haylen BT., *et al*. "An international urogynecological association (IUGA)/international continence society (ICS) joint report on the terminology for female pelvic floor dysfunction". *The International Urogynecology Journal* 21 (2010): 5-26.

15. Burgers R., *et al*. "Functional defecation disorders in children with lower urinary tract symptoms". *The Journal of Urology* 189.5 (2013): 1886-1891.

16. Barber MD., *et al*. "The impact of stress urinary incontinence on sexual activity in women". *Cleveland Clinic Journal of Medicine* 72.3 (2005): 225-232.

17. Butler RJ and Heron J. "The prevalence of infrequent bedwetting and nocturnal enuresis in childhood. A large British cohort". *Scandinavian Journal of Urology and Nephrology* 42 (2008): 257-264.

18. Swithinbank LV., *et al*. "The natural history of daytime urinary incontinence in children: a large British cohort". *Acta Paediatrica* 99 (2010): 1031-1036.

19. Eshpande AV., *et al*. "Management of daytime urinary incontinence and lower urinary tract symptoms in children". *Journal of Paediatrics and Child Health* 48 (2012): E44-E52.

20. Sureshkumar P., *et al*. "A population based study of 2,856 school-age children with urinary incontinence". *The Journal of Urology* 181 (2009): 808-816.

21. Chung JM., *et al*. "Prevalence and associated factors of overactive bladder in Korean children 5-13 years old: a nationwide multicenter study". *Urology* 73 (2009): 63-67.

22. Yousef KA., *et al*. "Daytime urinary incontinence among kindergarten children in aden governorate, 2003". *The Saudi Journal of Kidney Diseases and Transplantation* 21 (2010): 1092-1099.

23. Von Gontard A., *et al*. "Psychological and psychiatric issues in urinary and fecal incontinence". *The Journal of Urology* 185 (2011): 1432-1436.

Volume 9 Issue 11 November 2020