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RESEARCH ARTICLE

THE EPIDEMIOLOGY AND FACTORS ASSOCIATED WITH NOCTURNAL ENURESIS AMONG SCHOOL & PRESCHOOL CHILDREN IN HAIL CITY, SAUDI ARABIA: A CROSS-SECTIONAL STUDY.

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Abstract

Background: Enuresis, which is frequently diagnosed amongst school-children, is an important psychosocial problem for both parents and children.

Objectives: In the present study, we aimed to determine the prevalence and associated factors of enuresis in Saudi children in Hail, and to identify common methods used for its management.

Subjects and Methods: A cross sectional epidemiological study performed among children living in Hail, Saudi Arabia. A self-administered questionnaire was prepared for this study and distributed to the parents of 700 children whom aged 5--12 years.

Results: Of the 700 questionnaires distributed, 652 (93.14%) were completed.

The overall prevalence of nocturnal enuresis was 22.7% (n = 148). Female gender, young age, history of enuresis among parents or siblings, deep sleep and history of urinary tract infections and other social and psychological problems were associated factors with enuresis.

The percentage of children with enuresis seen by physician for treatment was 27% only. The percentage of children with enuresis treated traditionally was 40%.

Conclusion: Our results with enuresis prevalence and associated factors were comparable to other epidemiologic studies from various countries.

Furthermore, we demonstrated that families in Hail do not pay sufficient attention to enuresis and most of enuretic children do not receive professional treatment.

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Introduction:-

Nocturnal enuresis (NE) can be defined as the involuntary passage of urine during sleep beyond the age of anticipated nighttime bladder control, after 4-6 y of age [1, 2]. It is well known that nocturnal enuresis is a common, genetically complex and heterogeneous disorder among children [3].

Based on the DSM-IV (diagnostic and statistical manual of mental disorders IV) criteria, enuresis refers to the urination of children over 5 years old in clothes or in bed that happens twice a week for three consecutive months can occur at night, during the day, or a combination of these two, and is also called nocturnal enuresis [4]. Enuresis is classified as primary enuresis (urinary incontinence in a child who has never been dry) and secondary enuresis (urinary incontinence in a child who has been dry for at least 6 months) [5]. Nocturnal enuresis in children is the second most common disorder after allergic diseases [6]. Nocturnal enuresis can cause a variety of behavioral, psychological, and social problems including embarrassment, blushing, lack of self-esteem, and aggression. Therefore, identifying children at risk and performing therapeutic measures are necessary [6, 5].

The resulting distress of the NE to children and their parents shows the public health importance of this problem, and this merits further investigation.

Healthcare professionals need to be able to demonstrate knowledge of the causes, assessment and management of NE to provide patients and their families with individualized care [7].

Based on the results of various investigations, enuresis has many causes including developmental differences, for example, differences in the growth of the urinary sphincters of a child, various diseases like diabetes, urinary tract infections, and so forth, emotional changes and conflicts such as the birth of a new baby and scholastic or educational stressful conditions, and emotional crises such as parental separation and divorce, family conflicts, and so forth [5, 8].

The overall prevalence of nocturnal enuresis, as well as prevalence of nocturnal enuresis in different age groups is greatly varied in different countries, ranging from 2.3% to 25% [3].

Our aims in this study were to determine the prevalence and associated factors of enuresis in hail children, investigate the factors its relationship with personal and family characteristics and to identify common methods of its management.

Subjects and Methods:-

The study was a community-based cross-sectional survey performed in Hail city. Hail city is one of the big cities in Saudi Arabia with around 412,758 inhabitants.

The sample size was 652. A total 652 self-administered questionnaires were subsequently collated in an electronic format that were distributed to parents.

The questionnaires consisted of three parts. The first part contained information on socio-demographic factors such as gender, age, school performance. The second part included questions related to enuresis such as sleep pattern, social stressful events. Finally, the third part included information to assess the family-related factors.

Children were divided into three groups based on their ages as follows: group A = 5-7 years old, group B = 7-10 years old, group C = 10-12 years old. The division into the three groups was done to assess the impact of increasing age on the prevalence of nocturnal enuresis in children.

Statistical analysis:-

All the data was entered and analyzed with SPSS statistic program (statistical package for social sciences).

Results:-

A total of 700 questionnaires were administered out of which 652 questionnaires were returned giving a response rate of 93.14%.

Forty-eight questionnaires were excluded because the questions unresolved and either incomplete or the data filled was inconclusive.

A total of 652 questionnaires were analyzed in the study. Of these, 286 questionnaires were answered by parents of male children while 366 were answered by parents of female children. The age of the children included in the study

was from 5 to 12 years old .The most of the participants were between age (5-7) 41.1% (n=268), then between age (7-10) 34.0% (n=222), then between age (10-12)24.8% (n=162)[Table1].

The overall prevalence of enuresis was 22.7 % .The prevalence among boys was 24.8% (n=71 out of 286), while it was among girls 21.0%. (n=77 out of 366). The prevalence of enuresis decreased with age [Table 2] .

On exploring the characteristics of enuretic children it was noted that the rates of a positive family history for enuresis in siblings and parents were 37% (N=54) and 23.2% (N= 34) respectively, the prevalence of enuresis among mothers was 14.7% while it was 9.2% among fathers. [table3].

About the parents marital status, 20.2% of the parents of enuretic children were separate, while 79.8% of them are not separate [table 3].

School performance of children was excellent in 42.3%, moderate in 35.3%, poor in 2.5 [table 4].

Children who have deep sleep (often 51.5%, Sometimes 40.9%, never 7.5%) [table4].

Children who suffer from sleep disorder: 4.1% suffer from somnambulism, 10.9% narcolepsy, 2.8 % muscle contraction, 11.7% night mares, who suffer from hypersomnia 13.0%, and loss of ability to sleep and insomnia 7.5%[table 4].

About 12.8% of the enuretic children suffer from chronic diseases: (diabetes 2.3%, hypertension 0.7%, asthma 5.5% convulsion 1.4%, autism 0.7%, other 2.5% and who are not suffering from chronic diseases 87.2%) [table4].

These results show whether the problem of urination resulting from complications of some prior disease (3.5% yes, 77.0% no). [table4].

The number of times the children urinate at night (one or two times 16.3%, three times 18.4%, more than three times 30.7%) [table4].

The results showed that children who are sleeping in a cold room suffer from enuresis (54.3%) more than who sleep in the warm room (39.9%), and also it is increase when the children watch a horror carton 28.1% [table4].

The reaction of children after woke up and they wetted themselves (Be embarrassing 59.8%, anger 9.0, careless 26.5%) [table4]. The mother reaction when her child wets himself (receptive 61.5%, nervous 29.1%, beating 4.8%. [table4].

The results showed that 8.7% of children have urinary tract problems and it has been detected immediately after birth 2.9%, those detected early 8.1%, after long period 17.2% [table 4].

When we ask mothers if they know that the problem will be solved when they go to a specialist; the result was: 54.3% they know and 39.9% they do not know [table 5].

The results showed that 27.0% of mothers visited the doctor to solve the problem but 66.4% they did not and 40.0% of them use the traditional ways 52.8% they did not try traditional methods, then we ask if the results were satisfactory, 13.2% say it was, 42.9 say just a little bit 32.2% say it was not [table5].

About 40.5% stated that the medical methods are more effective, while 46.6% are more satisfied with the traditional methods [table 5].

Discussion:-

NE is recognized as a widespread health problem in young children and adolescents, but controversy exists regarding its prevalence among countries and communities. Various studies so far have used different criteria resulting in different prevalence being reported.

When the sex differences were analyzed, nocturnal enuresis was found more in girls (24.8%) compared with that in boys (22.7%), and this is accordance with other studies[9,10,11,12], e.g., in Turkey,[1] India[13] , but are more consistent with the findings from a study conducted in Aden (Yemen).

We found the prevalence of NE to be 22.7% in young school children and adolescents and its frequency decreases with increasing age. It is higher than that reported in other countries such as India (8.6%)[14], Slovenia (12.4%)[15], Australia (18.9%) [7] And recently, in Aden (Yemen) (17.2%)[17]. A study from Turkey, however, had prevalence of 25.5%, close to the result of our study .

There are publications reporting an important relation between nocturnal enuresis and family state, history, and genetics [18,19]. In a study performed in Malaysia, positive family history was determined in 53% of the enuretic children [19]. Another study from Turkey declared that this ratio was 63 and 6% in the enuretic and control group, respectively[20]. In our study, 23.9% of the children with nocturnal enuresis were found to have positive family history in parents with higher prevalence in mothers 14.7%, also 37% have positive family history in siblings. About 20.2% of cases of enuresis, parents are separated.

There have been few investigations of the severity of bedwetting in the literature. Ozden et al defined 33.3% severe enuresis as bed wetting every night in Turkish children[21]. In southeast Anatolia, the prevalence of "marked" enuresis [at least weekly] was 9.8%[22]. In Karachi, 30% of the children with bed wetting wet every night [23]. Wang et al found that the prevalence of bedwetting every night was 24.6% [24]. One third of the children with enuresis wet every night in our study. Our result is converged with other studies especially in Turkish study.

Our study also found a significant relationship between children who are hard to awaken and prevalence of NE, enuretic Children more likely to face difficulty in waking up than non enuretic children. Similar Sleep patterns of enuretic children were reported in other studies elsewhere [25,26]. Recent findings suggest that poor sleep quality may play a role in the continuation of NE. A vicious cycle of sleep fragmentation is suggested as a reason of an increased arousal threshold, which, in turn, leads to failure to respond to full bladder Signals and continuity of NE [27,28,29].

Sleep problems and Sleep disorders,relation to these findings were consistent with a study performed in Iran and Aden [17], [30]. Enuretic children are frequently aware of the social and emotional consequences and, in particular, commonly fear being discovered by others. Systematic studies support the notification that enuresis is associated with emotional distress in both children and parents, which is reversible once the children become dry[31].These negative feelings probably could have either positive or negative influence in the school performance of children. Our study showed that school children with NE were more likely at risk of facing difficulties in their school performance. Fergusson et al and Theunis et al have reported that older enuretic children face more psychological consequences of the wetting problem and, as a result, their perceived competency decreases as their age increases. This is opposed to that seen in children without NE, in whom the perceived competency increases with age [12]. Another study has shown that girls appear more vulnerable to emotional distress, with an increased risk of being more aware of their failing body. [12].These feelings of failure may have implications on their school performance, where success is very important. In our study we focused also on diabetes, constipation, asthma ,hypertension, autism and other diseases as major factors associated with NE, 91.7% of the children had no associated factors and 8.0% revealed associated factors ,and NE due to complications of previous cases of disease 3.5%. In other studies they focused on the low birth weight, growth retardation, constipation, bronchial asthma, allergy and liquid intake before go to sleep [31,32,33,12]. Also hypercalcemia, decreased level of vitamin B, migraine, habitual snoring and changes in brain microstructure have been highlighted as the possible causes for NE [34,35,36,37,38,39].

Our study focused on the frequency of wetting times per week. We found that, 4.6% urinate 3 nights per-week, and more than 3 times 1.5% and this result is consistent with a study carried out in Karachi [19] where 30% of the NE children wet the bed every night, and in Turkish children where [1] 33.3% of enuretics wet the bed every night. On the other hand our results are not consistent with another study which reported that 3% wet the bed more than twice a week [38].

During our research, we discovered that parents were scolding or beating their children after they discovered that they had wet themselves at night (4.8%) or be nervous (29.1%). This makes it worse and affects them psychologically and emotionally.

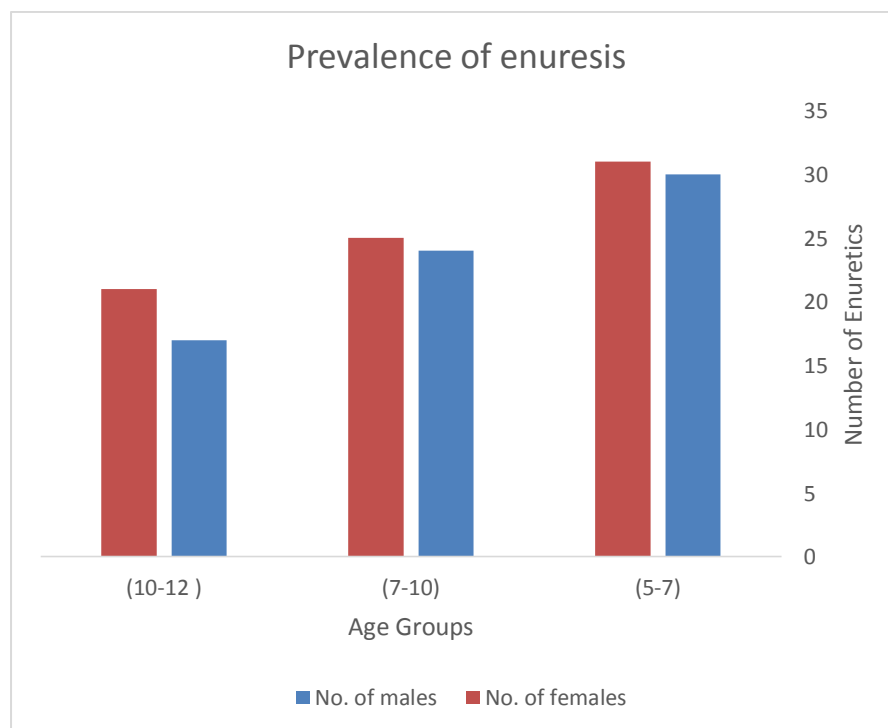
In our study, there was an increase in nocturnal enuresis In the case of watching the child horror cartoon by 28.1%, other studies have shown children with nocturnal enuresis had experienced a frightening event and 44.7% of them had emotional stress (sudden death, birth of new sibling, separation etc.) before the beginning of bedwetting.

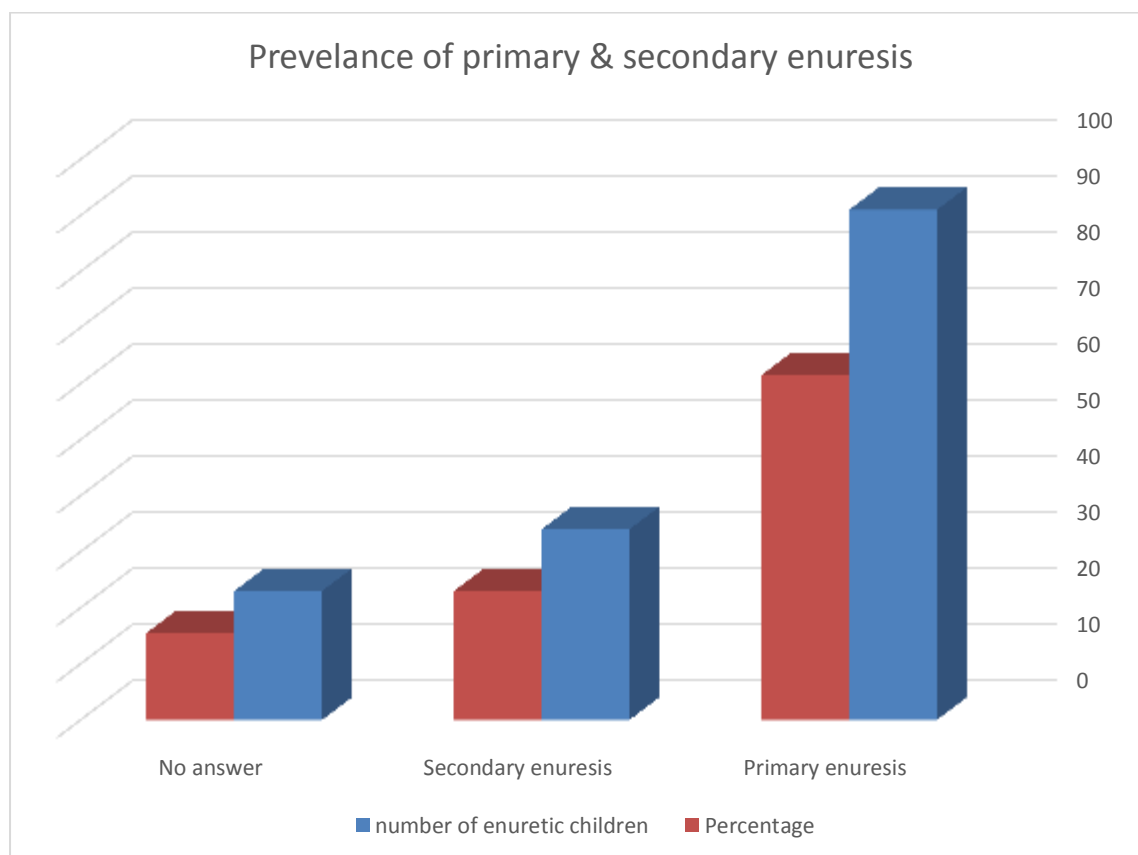
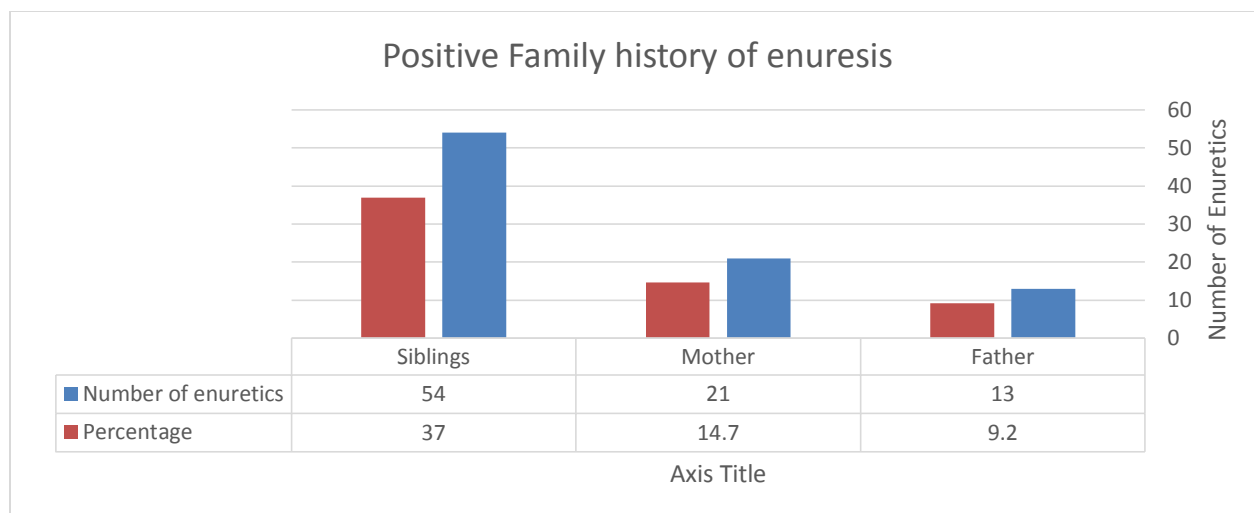
Many children with enuresis had a history of daytime incontinence (inability to control urine) and urinary tract infection. No further information was obtained in this regard. A linear relationship between enuresis and the frequency of urinary tract infection has been noted in the past. There have been recent reports of enterobiasis infection in children with enuresis being the sole symptom at presentation [40].

Also this result correlates with other studies [41,42] which confirmed that UTI is more strongly connected with secondary nocturnal enuresis and with day time wetting. Less than 5% of all bedwetting cases are caused by infection or disease, the most common of which is the urinary tract infection.

During the study, 54.3% Parents were found to have knowledge that the nocturnal enuresis would be resolved if they asked for physician help, however only 27.0% of the children were seen by a physician and previous series reported as 53.8%[44,11,45] these low rates demonstrate that most of the children with enuresis were not treated.40% used traditional methods and showed that traditional methods were 13.2% effective, the study showed that the traditional method its effect is better and faster than the medical method by 46.6%. Children with enuresis had a history of daytime incontinence (inability to control urine) and urinary tract infection. No further information was obtained in this regard. A linear relationship between enuresis and the frequency of urinary tract infection has been noted in the past. There have been recent reports of enterobiasis infection in children with enuresis being the sole symptom at presentation.

Other studies confirmed that UTI is more strongly connected with secondary nocturnal enuresis and with daytime wetting. Less than 5% of all bedwetting cases caused by infection or disease, the most common of which is the urinary tract infection.





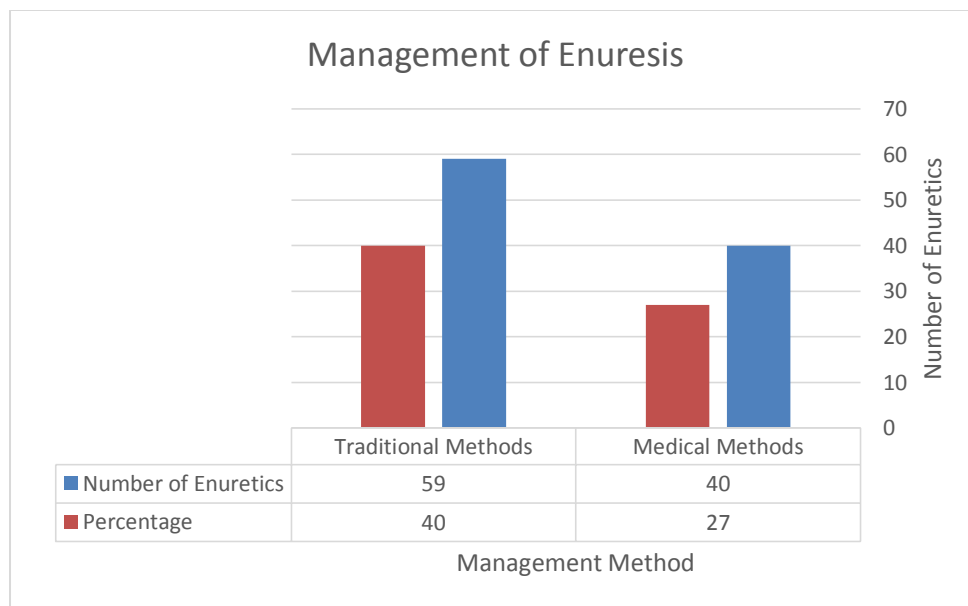
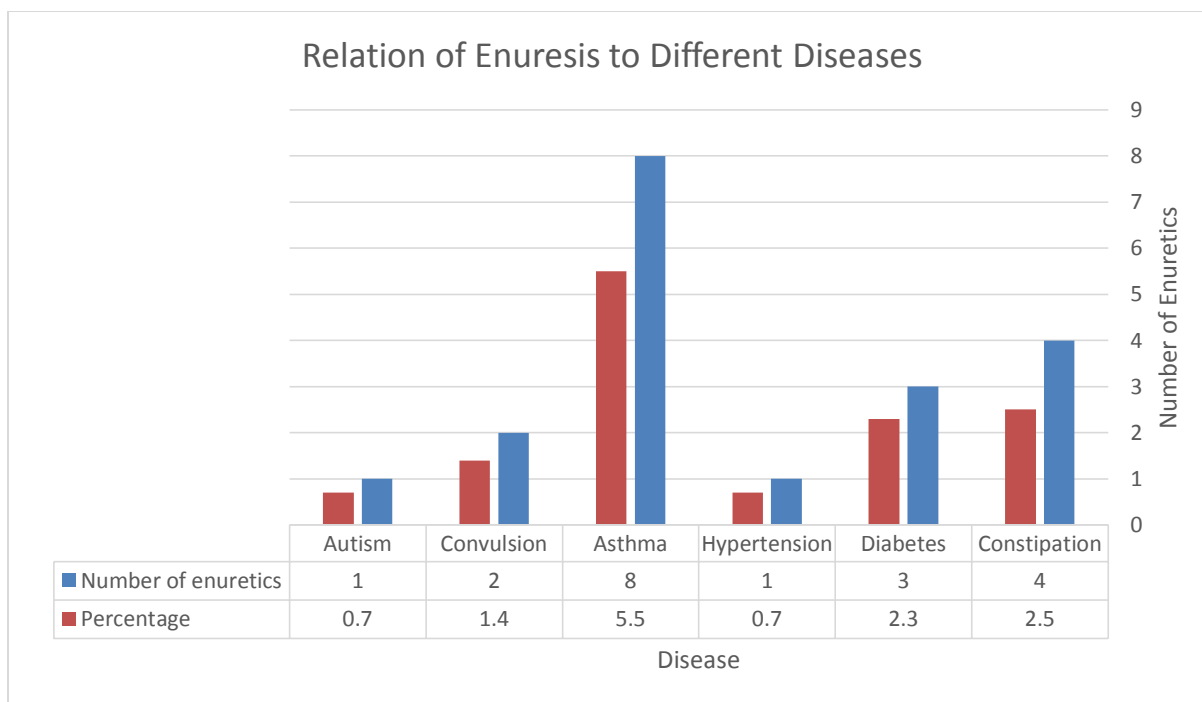


Table 1:-Gender and age distribution of children.

Data	No. of children	Percentage
Male	286	43.9
Female	365	56.0
Age(5-7)	268	41.1
Age(7-10)	222	34.0
Age(10-12)	162	24.8

Table 2:-Prevalence of enuresis

	Data	No. of children	Percentage	No. of males	No. of females
Eneuretics	(5-7)	268	41.1%	30	31
	(7-10)	222	34.0%	24	25
	(10-12)	162	24.8%	17	21
Total		652	100%	71 (22.7 %)	77 (24.8 %)

Table 3:-Family history of enuresis

Data		No.	Percentage
Parents state	Separate	30	20.2
	not separate	118	79.8
History of Nocturnal Enuresis in Parents	Yes	34	23.9
	No	79	53.5
Which One?	Father	13	9.2
	Mother	21	14.7
History of Nocturnal Enuresis in Siblings	Yes	54	37.0
	No	88	59.4

Table 4:-Characteristics of the enuretic children

Data		N	percentage
School performance	Excellent	78	42.3
	Moderate	60	35.3
	Poor	10	2.5
Does the child have deep sleep	usually	76	51.5
	sometimes	60	40.9
	never	12	7.5
Sleep problem	insomnia	11	7.5
	hypersomnia	19	13.0
	somnambulism	6	4.1
	narcolepsy	16	10.9
	muscle contraction	4	2.8
	night mares	17	11.7
Chronic diseases	Yes	13	8.0
	No	135	91.7
What is the disease?	diabetes	3	2.3
	Constipation	4	3.5
	asthma	8	5.5
	convulsion	2	1.4
	hypertension	1	0.7
	autism	1	0.7
Complications from previous illness	Yes	5	3.5
	No	113	77.0
Did the child have been dry before for at least 6 months?	yes	34	22.97
	No	91	61.5
	No answer	23	15.5
How many times of bedwetting per week?	1-3	51	34.5
	> 3	45	30.7
	No answer	51	34.7
Child reaction	embarrassing	88	59.8
	anger	13	9.0
	Indifference	39	26.5
	No answer	7	4.6
Problem increase in	horror carton	41	28.1
	others	52	35.3
	no answer	11	8.1

Mother reaction	receptive	91	61.5
	nervous	43	29.1
	beating	7	4.8
	no answer	7	4.8
Urinary problems	Yes	14	8.7
	No	131	89.1
	no answer	3	2.1
When detected and treated?	immediately after birth	4	2.9
	Early	12	8.1
	after a long period	26	17.8
	no answer	105	71.2

Table5:-Management of enuresis

Data		No.	Percentage
Did you know that the problem can be solved by doctor?	Yes	80	54.3
	No	59	39.9
	no answer	9	5.8
Did you ask for medical advice to solve this problem?	Yes	40	27.0
	No	98	66.4
	no answer	9	6.4
Did you use traditional methods for management?	Yes	59	40.0
	No	77	52.8
	no answer	9	6.5
Did you have satisfactory results?	Yes	19	13.2
	Little bit	63	42.9
	No	47	32.2
	no answer	17	11.7
Which was more beneficial, medical or traditional methods?	Medical	60	40.5
	traditional	69	46.6
	no answer	18	12.7

Conclusion:-

Nocturnal enuresis is a pediatric public health problem that is associated with young age, low socioeconomic factors, low educational level of parents, deep sleep, family history of nocturnal enuresis, history of urinary tract infection and psychological problems. We documented that most of the children with enuresis were not treated and the families in Hail city do not have adequate attention about enuresis.

Recommendations:-

NE in children is an alarming complaint that needs proper evaluation and proper management. Programs for raising parent awareness regarding nocturnal enuresis. Routine medical examination and laboratory investigations of children for early evaluation of the problem and proper treatment of such cases. Parent's reaction toward the child should be supportive and encouraging him to pass this problem.

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