

## Quality of Life among Children with Enuresis Attending at El-Minia General Hospital

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### Abstract

Children with enuresis may experience one or more of the following emotion problems: feeling of guilt, frustration, social isolation, fear of being discovered, confusion and intense embarrassment. This study aimed to assess the quality of life of children with enuresis and determine the relationship between enuresis and quality of life of enuretic children. A descriptive research design was used to conduct the study in the Pediatric Out-patient and Urology clinics in El-Minia General Hospital. It included 210 children (111 male and 99 female), aged from 5 to 18 years with no pathologic enuresis. Four tools were used for collecting data; **Tool (1)**: A structured interview questionnaire: included personal data and data related to enuresis; **Tool (2)**, Socio-economic scale, **Tool (3)**, Dysfunctional Voiding and Incontinence Symptoms Score Questionnaire (DVSS) and **Tool (4)**, Pediatric urinary incontinence quality of life instrument (PIN-Q) to assess the impact of enuresis on child's quality of life. This study results revealed that, the majority of children had primary and nocturnal enuresis (89.5% and 71.4%, respectively), there was correlation between the DVSS and PINQ score ( $P=0.003$ ). Also, it was found that, QOL is worse in male children and worsens with age ( $p=0.001$ ). **Conclusion**: there was a positive relation between DVSS and PIN-Q score. Self-esteem, family & home and mental health were the most effect domains.

**Recommendation**: psychological counseling is required when the child's self-confidence, self-esteem, or interpersonal relationship is deteriorating.

**Keywords**: *quality of life, enuresis, PIN-Q & DVSS.*

### Introduction

Children may develop abnormal voiding habits during or after toilet training. Some children do not learn to relax their pelvic floor muscle to allow effective emptying and others become so absorbed in computer games, television shows, play, or other activities, that, they postpone or do not take the time to void. Many children may delay voiding until the last minute, dance around, or will run in and out of the bathroom very quickly not taking the time to completely empty their bladder. Others children develop abnormal posturing behaviors such as Vincent's curtsy (squatting and compressing the perineum with the heel) to suppress bladder spasms and prevent inadvertent urinary incontinence. Parents are often not aware of their child's elimination habits once the child is toilet trained unless the child has a severe problem (Berry, 2005; Schulman and Berry, 2006).

Both medical and psychological communities describe enuresis as the most chronic and widespread of all childhood problems. Enuresis is also defined in the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV-TR) as the repeated voiding of urine into bed or clothes at least twice a week for at least three consecutive months in a child who is at least 5 years of age (Gunes et al., 2009).

Enuresis is common in school-age children, with an estimated prevalence of 5% to 15% in Western Countries suffer from enuresis. In Egypt, there isn't present of a study about the general prevalence of enuresis in the country, but there are different studies done in different places. Those studies were found that, the prevalence of primary nocturnal enuresis (NE) was 11.5 %, however, secondary type was 3.2% (Ismail et al., 2013 and Alkot and Deeb, 2012).

Enuresis can be further categorized into primary nocturnal enuresis or secondary nocturnal enuresis. Primary nocturnal enuresis is therefore bedwetting in a child aged 5 years or more who has never been dry for extended periods, while secondary nocturnal enuresis is the onset of wetting after a continuous dry period of more than 6-12 months (Ozden, et al., 2007).

The etiology of enuresis is not completely understood. Several pathophysiological mechanisms have been proposed, including bladder dysfunction, small functional bladder capacity, abnormal vasopressin levels, nocturnal polyuria, and abnormal sleep patterns. The diagnosis of enuresis is reserved for persons aged 5 and older who wet the bed at least twice per week for a period of three months, or who experience significant distress because of enuresis.

Nocturnal enuresis refers to involuntary voiding at night and diurnal enuresis refers to daytime wetting. (Bréaud, et al., 2012).

Although enuresis is generally a benign symptom, it causes considerable distress to both parents and child. Chronic anxiety, impaired self-esteem, and delayed developmental steps, such as, attending camps or sleeping at a friend's house may occur as secondary problems. Frequently, the psychological and developmental damage may actually be more significant and devastating to the child than the symptom of enuresis itself (Chang, et al., 2001).

Quality-of-life is a validated way of measuring a patient's perspective of his/her life situation. Self-completion of a robust questionnaire communicates the individual child's perceptions and views, which may differ from those of his/her parents or clinicians. Enuresis affects both the child and the family socially, emotionally and behaviorally. This places the child at risk for social isolation, peer conflict, teasing, and classroom challenges. As a result of symptoms the child with enuresis often suffers from low self-esteem and psychological distress (Landgraf, et al., 2004).

The relationship between enuresis and behavioral problems has been studied for several decades. Results range from enuretic children having no marked emotional, social or behavioral problems, to enuretic children with a 4.3-times increase in psychological difficulties compared with their non-enuretic peers. Also, they can have negative influence on everyday activities, family vacations, and on children's wishes and capabilities to leave home with friends and family. These children are known to be sadder, socially withdrawn, anxious, unhappy, or even depressed. They often face fear and spend most of their time in society under stress, because they are ashamed and try to cover up this disorder. (Assiri, et al., 2007).

#### **Significance of the study**

Enuresis is a source of significant anxiety to children and their families. Enuresis negatively affects the child's quality of life (QOL) and recently a cross-cultural incontinence specific pediatric quality-of-life measurement tool (PIN-Q) has been developed and tested psychometrically (Darcie and Kiddoo, 2012). Learning about the impact of enuresis on the individual child's self-esteem and quality of life will help researchers to understand whether screening and early intervention is required. Teaching others to recognize the symptoms early is vital to minimizing the psychological suffering of the child as well as the coping ability of both the child and the family (Schulman and Berry, 2006).

In the pediatric population, there are few data on the impact of enuresis on children's quality of life. The

few published studies have highlighted a significant impact of enuresis on quality of life in affected children. They have also indicated a differential effect of the nature of symptoms on various groups of children with enuresis (Dodson, et al., 2009). The purposes of this study were to describe QOL of children with enuresis using PIN-Q and investigated the association of voiding dysfunction using DVSS and QOL in affected children. In addition, we identify the predictors which decreased QOL in affected children.

#### **Aims of the study**

This study aimed to:

- Assess the quality of life of children with enuresis.
- Determine the relationship between enuresis (measured by DVSS) and quality of life of enuretic children (measured by PIN-Q).

#### **Research Questions**

The study answered the following questions:

1. Does the enuresis has impact on child's quality of life?
2. What are the predictors which may increase or decrease quality of life in children with enuresis?

#### **Subjects and methods**

##### **Research design**

A descriptive research design was utilized to meet the aim of the study.

##### **Setting**

This study was conducted in the Pediatric and Urology Out-Patient clinics at El-Minia General Hospital.

##### **Sample**

The study subjects included a convenient sample of 210 children with enuresis came to the previous mentioned setting during a six month period from the beginning of January until the end of June 2013 who fulfilled the following criteria:

##### **Inclusion criteria**

- Both gender.
- Age between (5-18years).

##### **Exclusion criteria**

- Children who have enuresis due to pathological causes.
- Handicapped children

##### **Tools For Data Collection**

Four tools were used for collecting data in this study.

**Tool (1):** Structured Interview Questionnaire, it was developed by researchers and included:-

**A**-Personal data of children: developed by the researcher and included age, sex, residence, number of family members, type of family, birth order.

**B-** Data related to enuresis as type of enuresis (primary or secondary), enuresis during night only or day only or mixed (day and night), positive family history among the first degree relatives, date of beginning of symptoms, duration of treatment, child has stressful life situation as for example arrival of new baby, school problems, divorce and physical or sexual abuse.

**Tool (2):** Socio-economic scale: It was developed by (Abd-Alla, 2002) and used to assess the socio-economic status of the children with enuresis. It included four domains; level of parent's education (8 items), family income (6 items), parents' occupation, life styles (3 items). Each item of the four domains has one score. The total score was divided into three classes as high from 85-100%, moderate from 60-84% and low for less than 60%. Income of family item has been modified by the researcher according to the rate of inflation and increase to be conforming with recent income through comparing difference of the value of the golden pound at 2002 to that, at 2014 and multiplying the rate of inflation to the scale.

**Tool (3):** The Dysfunctional Voiding and Incontinence Symptoms Score Questionnaire (DVSS): it was developed by (Akbal, et al, 2005) and used to assess the functional voiding dysfunction and incontinence symptoms. The questionnaire was composed of 13 questions of different forms (closed, multiple choice, open, etc.) regarding daytime symptoms, nighttime symptoms, voiding habits, bowel habits. A correct response was scored 1 and the incorrect zero (scoring was reversed for negative items). The scores of items were summed-up and the total score was determined to range from 0 to 35 with cutoff score 8.5. A score of greater than 8.5 has been shown to be associated with voiding abnormalities (the tool sensitivity 90% and specificity 90%).

**Tool (4) :** Pediatric urinary incontinence quality of life instrument (PIN-Q) used to assess the impact of enuresis on child's quality of life. It was developed by (Bower, et al., 2006) cross-culturally as a urinary incontinence QOL tool with excellent test re-test reliability and validity. It consisted of 20 questions and the responses were measured on Likart scale ranging from 0 - 4 with a maximum total score of 80. The total score indicated the impact of enuresis on the child's QOL, with the higher score indicating a more significant effect. This tool had five domains.

PIN-Q domains	No. of items
<b>Self esteem</b>	4 items
<b>Family and home</b>	4 items
<b>Social</b>	6 items
<b>Mental</b>	4 items
<b>Independence</b>	2 items

**Scoring system:** For every answer no=0, hardly ever =1, sometimes=2, often=3, all the time=4. The Cut-off values have not been published by authors for the PIN-Q to grade the severity of impact on QOL (mild, moderate, or severe), but this tool used by (Thibodeau et al., 2013) to assess impact of bladder dysfunction on child's quality of life and assumed that, mild =<20, moderate =20-50 and sever >50 (the sever indicating a more effect of enuresis on quality of life). The researchers used this classification on this research but modified this classification to <35=mild, 35-50=moderate and >50 sever (this modification was done because there was a difference in PIN-Q score ranges, the range in PIN-Q score of Thibodeau et al., (2013) study was 16-67 compared to 26-63 in this study)

#### Method of data collection

Administrative approval was obtained from the responsible persons (the directors of El-Minia General Hospital and the heads of the Pediatric and Urology Out-Patient clinic in the hospital) to carry out the study after explaining the purpose of the study.

**Validity:** The tools were transferred to Arabic language and reviewed to ascertain their content validity by five experts in nursing and medicine.

**\*Reliability:** The tools were measured for reliability using Cronbach Alpha ( $\alpha = 0.87$ ).

**Pilot study:**

A pilot study was carried out before starting of data collection on 10% (No.=15 children) of the study period for the purpose to test the clarity, completeness, and to determine the time involvement.

**Field of the study:**

Data was collected by the researcher for a six month period from the beginning of January until the end of **June (2013)**. The researcher interviewed each participated child and his parent individually to obtain the necessary information. The Pediatric and Urology Out-Patient clinics were working all days in the week. The actual work started by meeting the children where the researcher firstly introduced herself and gave a complete back ground about the study. The researcher gave older children who can read and write or the parents' of young children the sheet which was pre-designed in Arabic language and stayed with them in special room to clarify any vague question or to read the sheet if the child or his parent unable to read it. The sheet required about 15-20 minutes for filling it; about 2-4 cases were collected per day.

**Ethical considerations:**

After explanation of the aim and methodology of the study was done the researcher told children and their parents have ethical rights to agree or refuse to participate in the study. Consent to participate in the

study was secured orally and informed that the information obtained will be confidential and used for the purpose of the study.

#### Statistical design

Data were analyzed using the statistical package for social science (SPSS) version 16.0 (SPSS Inc., Chicago, Illinois, USA). Data were presented using descriptive statistics in the form of frequencies and

percentages for qualitative variables, means and standard deviations for quantitative variables. Quantitative continuous data were compared using Chi. Square to determine significance for non-parametric variable. Probability (p-value) less than 0.05 was considered significant.

## Results

**Table (1): Personal characteristics of the studied children (n= 210).**

	No. (n= 210)	%
<b>Age</b>		
< 8 years	70	33.3
8 - < 12 years	91	43.3
≥ 12 years	49	23.3
<b>Mean ± SD (Range)</b>	9.14 ± 3.01 (5 – 17)	
<b>Sex</b>		
Male	111	52.9
Female	99	47.1
<b>Residence</b>		
Rural	168	80.0
Urban	42	20.0
<b>Birth order</b>		
First	47	22.4
Second	67	31.9
Third	52	24.8
Fourth or more	44	21.0
<b>Family type</b>		
Nuclear	88	41.9
Extended	122	58.1
<b>Social class</b>		
Low	36	17.1
Middle	145	69.0
High	29	13.8

**Table (2): Characteristics of enuresis among the studied children(n= 210).**

	No. (n= 210)	%
<b>Child symptoms</b>		
Enuresis during night only	150	71.4
Enuresis during day and night	60	28.6
<b>Primary or secondary enuresis</b>		
Primary enuresis	188	89.5
Secondary enuresis	22	10.5
<b>Positive family history</b>		
Yes	109	51.9
No	101	48.1

	No. (n= 210)	%
<b>Duration of treatment</b>		
From one month to one year	36	17.1
From one year-three years	20	9.5
More than three years	7	3.3
Interruption treatment	118	56.2
Not take treatment before	29	13.8
<b>Child's experience something stressful</b>		
Yes	191	91.0
No	19	9.0

Figure (1):- Total DVSS and PIN-Q mean scores.

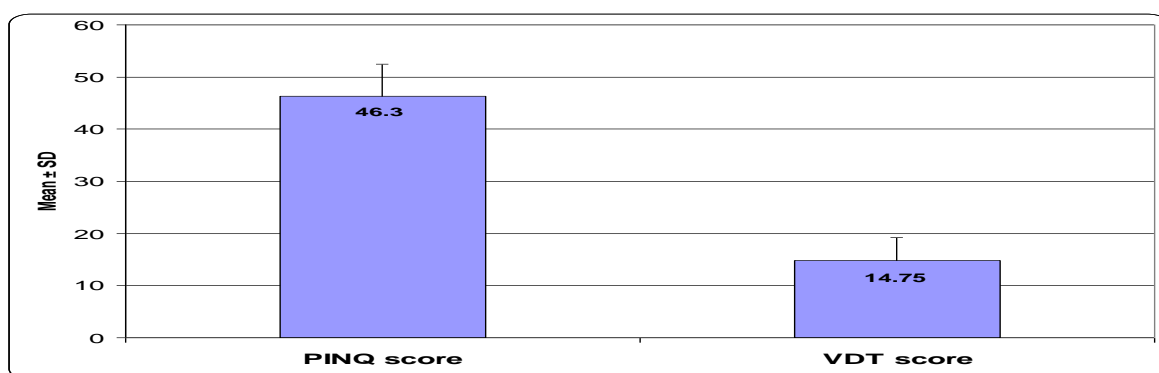
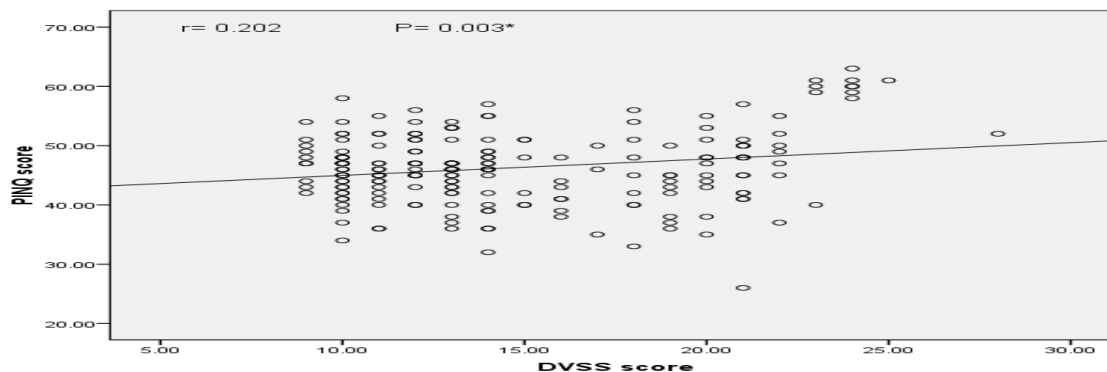


Table (3):- Mean scores of PIN-Q domains among the studied children (n= 210).

PIN-Q domains	Items scoring	Mean ± SD	Range
Self esteem	16	11.23±1.94	5 – 16
Family and home	16	10.09±1.51	4 – 14
Social	24	13.13±2.02	7 – 19
Mental	16	9.84±2.11	5 – 16
Independence	8	2.00±1.04	0 - 4

Figure (2):- Correlation between DVSS and PINQ score.



**Table (4): Relation between total PIN-Q score and personal characteristics of studied children (n= 210).**

	PINQ score						X2	P-value
	Low (n= 42)		Moderate(n=139)		Sever (n= 29)			
	No.	%	No.	%	No.	%		
Age								
< 8 yrs	27	38.6	40	57.1	3	4.3	32.63	0.001*
8 - <12 yrs	11	12.1	68	74.7	12	13.2		
≥ 12 yrs	4	8.2	31	63.3	14	28.6		
Sex							7.17	0.028*
Male	15	13.5	77	69.4	19	17.1		
Female	27	27.3	62	62.6	10	10.1		
Social class								
Low	6	16.7	23	63.9	7	19.4	3.33	0.504
Middle	28	19.3	100	69.0	17	11.7		
High	8	27.6	16	55.2	5	17.2		
Child experienced stressful life situation								
Yes	26	13.6	125	65.4	40	20.9	1.17	0.556
No	2	10.5	14	73.7	3	15.8		

**Table (5): Relation between total PIN-Q score and the characteristics of enuresis (n= 210).**

	PIN-Q score						P-value
	Low (n= 42)		Moderate(n= 139)		Sever (n= 29)		
	No.	%	No.	%	No.	%	
Child symptoms							
Enuresis during night only	30	20.0	102	68.0	18	12.0	0.471
Enuresis during day and night	11	18.3	37	61.7	12	20.0	
Type of enuresis							
Primary enuresis	39	20.7	127	67.6	22	11.7	0.034*
Secondary enuresis	3	13.6	12	54.5	7	31.8	
Presence of positive family history							
Yes	21	19.3	82	75.2	6	5.5	0.001*
No	21	20.8	57	56.4	23	22.8	

Personal characteristics of the studied children presented in **Table (1)**. It was noticed that, three quarters of the children between the age of <8 years and 8- 12 years (33.3% and 43.3%, respectively) were still wetted their beds, while it was 23.3% for 12 and more years-olds. Also, more than half of children were males and their family type was extended family (52.9% & 58.1% respectively). The majority of the studied children came from rural area and has moderate socio-economic level (80% and 69% respectively).

**Table (2)** : showed the characteristics of enuresis among the studied children. It was found that, the majority of the studied children have nocturnal and primary enuresis (71.4% and 89.5% respectively). Enuresis was found to be more in children with positive family history (51.9%) and 91% of studied children had experienced stressful life situation (as

for example new baby, school problems, divorce and physical or sexual abuse).

**Figure (I)**: illustrated the total DVSS and PIN-Q mean scores among studied children, it was found that, the response of children to DVSS ranged from 9-24 with mean  $14.75 \pm 4.47$ , and mean PIN-Q score was  $46.30 \pm 6.11$  (ranged from 26-63).

The mean scores of PIN-Q domains among the studied children clarified in **Table (3)**. According to the response of the children to domains of PIN-Q score, it was noticed that, the self-esteem, family & home and mental health domains of PIN-Q score were the most affected domains (with mean score  $11.23 \pm 1.94$ ,  $10.09 \pm 1.51$  and  $9.84 \pm 2.11$ , respectively). Figure (II) described the correlation between the DVSS and PINQ score. The more DVSS score increase, the more PIN-Q score increase, with highly statistically significant difference ( $P=0.003$  /  $r=0.202$ ).



**Table (4) :** presented the relation between total PIN-Q score and personal characteristics of studied children. It was found that, more than one third of younger children (< 8 years) had low PIN-Q score and only 4.3% of them had severe score. On the other hand, more than one quarter of children with 12 years old and more (28.6%) had severe score compared to only 8.2% of them had low score. This revealed that, there is a statistical significant relationship between the impact of enuresis on the children's quality of life and their age ( $P < 0.001$ ) [i.e. the child's age increase, the impact of enuresis on the quality of life increase]. Also, it is clear from the same table that, the higher percentage of the children with severe PIN-Q scores (17.1%) were male while more than one quarter of them (27.3%) with low PIN-Q score were female with statistically significant difference ( $P=0.028$ ). Regarding the relation between total PIN-Q score of the studied children and their social class, it was found that, there was no statistically significant difference.

**Table (5) :** described the relation between total PIN-Q score of studied children and characteristics of enuresis. Regarding type of enuresis only 11.7% of the primary enuresis children had severe PIN-Q score compared to about one third of secondary enuresis children (31.8%) had severe PIN-Q score with statistically significant difference ( $P=0.034$ ). Also, it was found that, most of the children who had positive family history (75.2%) had moderate PIN-Q score and only 5.5% of them had severe PIN-Q score. On the other hand, more than half of children who didn't have positive family history (56.4%) had moderate PIN-Q score and about one quarter of them (22.8%) had severe score with highly statistically significant difference ( $P=0.001$ ).

## Discussion

Due to the growing recognition of patient perspectives in health care, quality of life assessment is an important part of the research. Measurement of quality of life in children with enuresis gives a child centric estimate of the impact of enuresis on his QOL (Bachmann, et al., 2009).

It is noticed from results of the present study that, the highest percentage of children had primary nocturnal enuresis. This finding is supported by the results of Yousef et al., (2011) who found that, about three quarters of their cases had primary nocturnal enuresis and one quarter had secondary nocturnal enuresis. Also, it is quite close to those of study done by Azhir et al., (2007) in Isfahan, Iran, who showed that, the majority of their cases had primary nocturnal enuresis and few percentages had diurnal only or mixed.

Prevalence of enuresis changes significantly with age. The present study revealed that, the incidence of enuresis decreases with age, this might be due to the fact that, spontaneous resolution of enuresis increases with the increase of the age which may be the result of the further development of the bladder control. In addition, as the children become older, they are more aware of the problem of enuresis so they try to control themselves more than younger children. This finding goes with Mohammad and Mohsen, (2012) in Menofia Governorate and Yousef et al., (2011) in Aden Governorate, Yemen who found that, the prevalence of enuretic decreased as the age increased because enuresis is mostly expected to improve spontaneously. Also, the result of the current study is in agreement with Emad et al., (2005) in rural areas of Assiut Governorate, who reported that, the prevalence of enuresis decrease with increasing of the child age.

Most girls can stay dry at night by age six and most boys stay dry by age seven. Boys are three times more likely to wet the bed than girls (Donna and D'Alessandro, 2008). In this regard, the present results were found that, enuresis slightly more common in boys than girls. This might be attributed to the girls reach puberty at earlier ages than boys. This finding in line with Ismail et al., (2013). in Qena Governorate who found that, enuresis was higher in male gender than female. Also, in agreement with this, findings of study done in Turkey by Gunes et al., (2009). which showed that, enuresis appears more often among boys than girls. In contrast with the present study results, El-Shereef et al., (2011). reported that, there was no significant difference in prevalence of nocturnal enuresis between boys and girls.

The finding of the present study showed that, the percentage of enuresis was more common in children with rural inhabitation than those with urban inhabitation. This finding may be related to poor sanitation, lower educational level of parents, large number of individuals in home, and smaller monthly income for rural families as compared to those for urban families. Similar findings were reached by Dolgun et al., (2012) and are in accordance with a study conducted by Hashem et al., (2013) in Urmia, Iran in their study indicated that, enuresis is associated with crowded families, rural areas, and low social class. Enuresis is frequently associated with a family history of enuresis (Fritz et al., 2004). In the present study, presence of nocturnal enuresis among studied children was significantly associated with family history of enuresis among fathers and/or mothers. This finding is in congruence with a study done in Assiut Governorate by Emad et al., (2005). who found that, there is a greater incidence of primary nocturnal enuresis in children whose parents were enuretic compared to those families with no parental history.

Also, **Farghaly et al., (2008)**, in their study in Al-kharga District (New Valley) showed that, the prevalence was significantly higher among children who had positive family history of primary enuresis. Moreover, in a study done at Al-Mukalla City, Yemen by **Aljefri et al., (2013)**, found that, the risk of being an enuretic child is five-times higher if a family member had a history of enuresis..

As regard birth order, the results of the present study clarified that, the percentages of children's different birth orders are convergent with slightly high in second birth order. This finding was in agreement with **Rona et al., (1997)** in their study of the population of England and Scotland, found that primary nocturnal enuresis was more likely in a child who was not the first born in the family. On the contrary, **Unalacak et al., (2004)** found no relation between the frequency of enuresis and the birth order of the child.

Enuresis may be caused by psychological issues (e.g., death in the family, sexual abuse, extreme bullying) especially secondary type which is often associated with stress (**Stanley and Swierzewski, 2012**). It is noticed in the present study that, the majority of enuretic children had stressful life situation. This finding is supported by the result of **Ismail et al., (2013)** who found that, stressful events are risk factor of enuresis and nocturnal enuresis was around two-times more prevalent if the child was facing some psychological or social disturbances. In addition, **Hashem et al., (2013)** found that, the prevalence of enuresis was high significant among children who experience stressful life situation as divorcing parents, fighting parents, excessive punishment and a birth of new baby in the family.

The severity of the underlying bladder problem is expected to have a proportional adverse effect on quality of life (QOL) in children with enuresis. When the researchers in this study assessed quality of life in children with enuresis using a disease specific tool (PIN-Q), they noticed that, the enuresis had significantly worse impact on child's QOL. This finding supported by **Wolfe-Christensen et al., (2013)** who reported that, enuretic children had lower quality of life than those without enuresis. Similar result was found by **Karničnik et al., (2012)**, who reported that, bladder dysfunction reduce QOL of children. Also, the results of the current study were supported by studies conducted by **Naitoh et al., (2012)** and **Yasuyuki et al., (2012)** who reported that, nocturnal enuresis is a condition that, negatively affects the health related quality of life of children.

The most important dimension that has been explored in the present study was the correlation between enuresis measured by (DVSS) and its impact on child's quality of life (QOL) measured by (PIN-Q). It was found that, there was a correlation between

enuresis and child's QOL as when the DVSS score increased the PIN-Q score also increased. This finding is in the line with **Thibodeau et al., (2013)**, who reported that, DVSS and PIN-Q responses were positively correlated; as DVSS scores increased the PIN-Q showed a corresponding rise, which validates the relationship between voiding dysfunction and QOL.

Moreover, the results of the current study clarified which domains of the quality of life had been greatest worse impact of enuresis (i.e. the highest score in quality of life domain indicated the greatest worse impact of enuresis on child's quality of life). It was noticed that, self-esteem, family & home and mental health were the most affected domains in enuretic children. This finding is in congruence with **Natale et al., (2009)**, who indicated that, self-esteem and mental health were the most affected domains in children with bladder dysfunction. Also, **Kiddoo DA., (2012)**, who reported that, the nocturnal enuresis is a common condition that can affect child's self-esteem. Furthermore, a study by **Alkot and Deeb, (2012)**, conducted in Menofia Governorate found that, children with enuresis may experience social isolation, fear of detection, sense of immaturity, and loss of self-esteem. Regarding enuretic child's sex and QOL; results of the current study revealed that, the male had a greater impact on the quality of life than the female. This finding is quit close to that, of **Bachmann et al., (2009)**, who found that, a high total score of PIN-Q score (indicating greater impairment in quality of life) were combined with boys. Also, according to findings reached by **Bower et al., (2006)**, boys are more adversely affected by bladder dysfunction than girls. On the contrary, **Deshpande, et al., (2011)**, found that, female gender was associated with a worse QOL in univariate and multivariate analysis. On the other hand, **Thibodeau et al., (2013)** in their study found that, there were no differences between male and female responses, implying an equal degree of effect on QOL. In relation to QOL and enuretic child's age; the current study found that, the impact of enuresis tends to be higher in older children. As the age increase, the worst impact of enuresis on child's QOL. Surprisingly the earlier study by **Bower, (2008)**, who used the same tool did not demonstrate this association. This finding is important given the common belief that enuresis tends to resolve with age. It is possible that, older children need more psychological support despite relatively minor symptoms. The same results were reached by **Deshpande, et al., (2011)**, who found that, age of children was significantly associated with weighted QOL score, and thus was independent predictors of QOL in these children.

As for type of enuresis, when compare results between both types of enuresis (primary and secondary)



regarding PIN-Q scale in the present study, it was found that, the children with secondary enuresis had greater PIN-Q score than those with primary type with statistically significant difference. This finding could be interpreted that those children with secondary enuresis had a period of control over their urination so when the problem of enuresis relapse to them affected on their psychological status negatively than those who did not have period of control from the birth (primary enuresis ).

As regard to positive family history, this study found that, the children who didn't have positive family history had greater impact of enuresis on their quality of life (QOL) than those who had positive family history with statistically significant difference. This finding could be interpreted that, those children without positive family history, the enuretic problem was considered very stressful for them as all family members control urination at normal time and they were more affected and bothered by the wetting. While those with positive family history considered this problem will solve at any time and were very resilient and adapted. In addition, family members spoke about learning to deal with the wetting over time.

## Conclusions

Based on the results of this study, it can be concluded that,:

- There was a positive correlation between enuresis and child's QOL as when the DVSS score increased the PIN-Q score in affected children also increased.
- It appears that, QOL is worse in male children, and worsens with age.
- Self-esteem, family & home and mental health were the most affected QOL domains in children with enuresis

## Recommendations

Based on the finding of the current study, the following recommendations are suggested:-

- Health team personnel should maintain close contact with the family during the treatment period to provide support and to prevent possible behavioral and self-esteem problems, especially in primary nocturnal enuresis.
- Psychological counseling is required when the child's self-confidence, self-esteem, school performance or interpersonal relationship is deteriorating.
- Support to enuretic children and their parents either emotionally or financially are mandatory.
- Further research in a larger group of children is necessary.

- Future research can investigate the impact of enuresis on family at all.
- Future research to investigate the factors affecting QOL of enuretic children.

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