PILOT STUDY ON THE EFFICIENCY OF BOWEN THERAPY ON NOCTURNAL ENURESIS

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Introduction: Bedwetting (enuresis nocturna) is the most common type of urinary incontinence in children. It has a significant psychological impact on both the child and the parents. It can be a painful, stressful, and sometimes a frustrating condition.

There were three types of enuresis:

- Primary enuresis: where no period of continence is experienced; the child is wetting themselves every night.
- Periodic enuresis: wet and dry nights alternate.
- Secondary enuresis: enuresis symptoms return after at least six months of dry nights. Often, secondary enuresis is an indicator of a suppressed medical or psycho-emotional issue.

Nocturnal enuresis is not yet clearly understood due to the great number of etiological factors [1].

Historically, enuresis was chiefly regarded as a psycho-emotional disorder, but this concept changed drastically in the end of the last century as it became clear that somatic factors such as nocturnal polyuria resulting from a vasopressin deficiency, hyperactive detrusors, etc. play a role in the pathogenesis of this condition. [6].

Causes: Nocturnal enuresis has a multifactorial aetiology. It may include emotional, physical, and even developmental issues. Various theories exist that attempt an explanation of nocturnal enuresis, but it is most commonly a combination of factors.

Deep sleep and sleep problems: Nervous system immaturity is indicated as a very probable cause of primary enuresis because it is still difficult for the brain's sleep centres to identify and assess signals sent by a filled bladder. Enuresis also frequently occurs in children suffering from sleep problems and sleep apnoea.

Small bladder: Statistical research data show that a part of children suffering from nocturnal enuresis have a smaller-size bladder and a lower bladder capacity, respectively. This, in conjunction with deep sleep, often leads to the child failing to wake up when an urge to urinate has been felt.

Physiological disorders: Stress factors and events such as the parents divorcing, a new environment or home, the death of a relative or a pet, as well as any psychological trauma can trigger enuresis, especially secondary enuresis.

Physiological disorders: Enuresis can also be analysed in terms of a problem with waking when an urge to urinate is present. In healthy children, once the bladder reaches its full capacity, a sudden urge to urinate occurs that is inadequate in children with enuresis. EEG analyses of children with enuresis show that an inadequate change in sleep depth occurs, which is reflected by conventional polysomnographic technology [4]. It is still being researched as to whether these were cases of sleep disorder or deficiency in communication between the bladder and the cerebral cortex. Sleep phase disorders may lead to a change in physiological inhibitory signals to the bladder that have been observed in animal studies. This mechanism is also a likely factor in children with nocturnal enuresis or sleep apnoea.

Familial predisposition: If one parent has suffered from enuresis, the likelihood that his or her children suffer from it, too, is approximately 40%, and if both parents have had this problem, the likelihood increases to 75% [5]. Genetics and family environment were important factors that need to be considered.

Congenital defects or medical conditions: There is a medical explanation for the condition in fewer than 1% of children suffering from enuresis, such as urinary tract infections, abnormal innervation, diabetes, etc. Some congenital malformations of the spine, e.g. spina bifida, may also be related to nocturnal enuresis, which is often accompanied by daytime incontinence. Experts recommend MRI in order to rule out or confirm, respectively, other malformations of the spine [4].

Large intestine: Latent megacolon (distention of the intestinal wall) is often an undiagnosed cause of nocturnal enuresis.

Insufficient production of antidiuretic hormone (ADH): ADH (also known as arginine vasopressin) is a hormone secreted by the pituitary gland that regulates body water balance and is related to reverse flow of water into the kidneys, making them produce less urine. Under normal conditions, nocturnal secretion of arginine vasopressin is higher than daytime secretion. This results in a 50% reduction in the production of urine at night. Studies have shown that some children suffering from enuresis produce less ADH during the night, which leads to the creation of more urine while asleep [7]. This automatically increases the probability of bedwetting in such children.

Increased production of prostaglandin and nitrous oxide (NO): Some children with nocturnal enuresis have over 10-fold excess of the norm of nitrous oxide (NO). These children also have a 2-fold increase in their levels of prostaglandin. The high concentration of NO reduces ADH levels, which results in an increased night-time production of urine [5].

Deficiency of Omega-3 fatty acids: Omega-3 fatty acids play an important role in the development and function of the central nervous system and can be related to potential problems in its development, particularly the slow formation of continence reflexes. These fatty acids have been proven to impact the formation of the brain area that is responsible for urination control [5].

Diet: Some foods and foodstuffs can have an adverse effect. Children suffering from enuresis should avoid dairy products, apples and apple juice, carbonated drinks, excessive quantities of sugar products, and products that have undergone additional processing. It is recommended that the child drink alkaline water having a higher pH. [5]

Enlarged tonsils: It has been established that children with hypertrophic tonsils sleep markedly better in the postoperative period (after removal of the tonsils) and bedwetting episodes were gradually reduced and frequently discontinued. A survey of the study group comprising a total of 57 children shows that in the postoperative period 61.4% (35) of the children have no enuresis, 22.8% (13) have a decrease of enuresis, and 15.8% (9) have no change [2].

In most cases of children with enuresis, a combination of several of the above-mentioned factors is established.

Bowen Therapy: The Bowen technique is a complementary manual modality where the focus is on stimulating the body's inner ability to self-regulate. The therapy originated in Australia and represents a unique form of neuro-muscular recovery. Throughout the application of osteopathic-type moves over key neuro-muscular and/or neuro-lymphatic points, the Bowen technique stimulates the self-healing mechanisms in the body allowing it to achieve better homeostasis. The one thing that distinguishes the Bowen technique from other manual modalities is the use of mandatory therapeutic breaks within the session. These breaks are needed for the body to respond to the signals sent to the nervous system by the

Bowen moves. A major advantage of Bowen is the almost complete absence of contraindications and adverse side effects. It completely fulfills the basic principle in medicine – "Primum non nocere" – Do no harm above all.

Bowen therapy has a good clinical reputation for treating children with enuresis, but the mechanism of effectiveness is poorly understood. For this reason, the Bowen Therapy Association of Bulgaria has initiated a research study aiming to establish the quantitative effect of the severity of enuresis by means of Bowen therapy, by comparing the number of dry nights before and after treatment with Bowen.

Study objectives:

1. Is the number of dry nights affected by the application of Bowen therapy?
2. Can a relationship be established between the number of parents the child lives with and the severity of occurrences?
3. Is there a relationship between the child's having siblings and the occurrence of nocturnal enuresis?
4. Is the occurrence of nocturnal enuresis connected to hereditary factors (parent or parents having this problem in the past)?
5. Is there a relationship between the manifestation of symptoms of nocturnal enuresis and attending kindergarten or school?
6. Is there a relationship between the type of childbirth (natural or C-section) and the severity of nocturnal enuresis?

Materials and methods: The study involved a total of 43 children aged up to and including 7 years of age. Children older than 7 were not included in the study because of the higher psycho-emotional component associated with the older age. Children having accompanying problems and conditions, e.g. autism, cerebral palsy, were also excluded from the survey. All children were subjected to Bowen therapy with a frequency of once per week. The results of every session were written down in a chart. The study only takes into consideration results collected up until the eighth session. More than eight sessions were conducted with some children, but in these cases any results after the eighth session were not taken into consideration in the study. All parents completed a questionnaire and have signed a declaration of consent. The data thus obtained were entered in the STATGRAPHICS program environment.

Assessment method: All results have been graded. We have graded them on a scale of 0 to 6 according to the number of dry nights per week. The grades were as follows:

Grade 0: 0 dry nights per week
Grade 1: 1 dry night per week
Grade 2: 2 dry nights per week
Grade 3: 3 dry nights per week
Grade 4: 4 dry nights per week
Grade 5: 5 or 6 dry nights per week
Grade 6: 7 dry nights per week

To further facilitate and summarise the results, we grouped the children into four categories according to their grade and number of dry nights per week.

- Grade 0–2: children experiencing no or little improvement
- Grade 3–4: children experiencing a good, noticeable improvement
- Grade 5: children experiencing a very good improvement
- Grade 6: children experiencing an excellent improvement

Results: Several factors were observed in the study children that we considered may be related to the occurrence or severity of enuresis. These factors were as follows: attending kindergarten or school, intake of medications, medical history of a parent with enuresis in the past, childbirth type – natural or C-section, whether the child lives with one or both parents, whether the child lives with his or her biological parents, whether the child has any siblings, as well as the volume of water consumed during the day.

Following statistical processing of the data, multiple results were obtained. We have sought interconnectedness of the results obtained with the factors monitored. We have presented the results in charts and graphs.

I. Regarding the first objective of the study, a clear correlation was established between the parameters “number of Bowen procedures received” and “number of dry nights after the therapy”.

Table 1 Change in the number of dry nights after the application of Bowen therapy

Number of dry nights	Number of children before and after therapy		Number of children before and after therapy in %	
	Before	After	Before	After
0	9	3	20.94	6.98
1	11	8	25.58	18.60
2	8	3	18.60	6.98
3	8	3	18.60	6.98
4	3	4	6.98	9.30
5	4	4	9.30	9.30
6	0	5	0	11.63
7	0	13	0	30.23

The data shows that the number of dry nights increased significantly after undergoing a course of Bowen therapy. There were no patients in the group of children before the therapy who reported 6 or 7 dry nights within the same week, which is understandable. On the other hand, after a course of Bowen therapy, a significant increase was observed in the percentage of children who had 6 and/or 7 dry nights within the same week.

Results have been analysed and compared to the grade and category, as follows:

Grade 6: 30.23% of children received a grade of 6, i.e. excellent effect (7 dry nights out of 7 per week). Prior the Bowen sessions, no children were reported by their parents to have zero days of bed-wetting, in contrast to after conclusion of the therapy, when 7 dry nights within the same week were reported in 13 children.

Grade 5: 20.93% of children have received a grade of 5, i.e. very good effect (5 or 6 dry nights per week). While the number of such children was 4 before the therapy, with no children reporting 6 dry nights, after the Bowen sessions, the number of children rose to 9, of whom 5 had 6 dry nights per week and 4 had 5 dry nights per week.

In view of the above, we see that 51.16% of all children with enuresis treated in the course of the study experienced an excellent or a very good effect from the Bowen sessions.

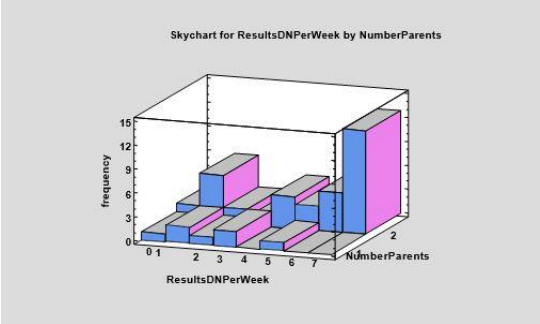
Grade 3–4: These were children experiencing a partial effect, i.e. 3 or 4 dry nights were reported per week. They make up 16.28% of the total number of

participants. A total of 11 children were in this group before conducting Bowen therapy, while after completion of the course, there were 7.

Grade 0–2: This is the group of children experiencing little or no effect, where parents only reported one or two dry nights per week or no change at all. It makes up 32.56% of the total number of participants. The number of children before the Bowen sessions was 20, while after conducting the therapy course, the number dropped to 11.

II. The study's second objective was to try and establish a connection between the number of parents the child lives with and the severity of occurrences.

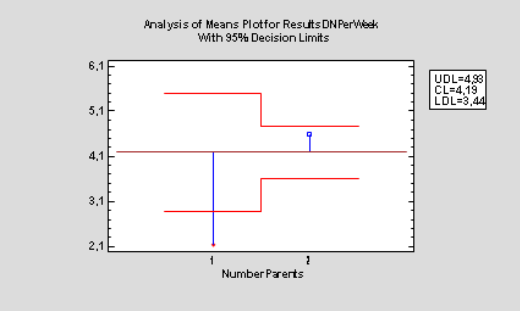
Graph 1. Results from the juxtaposition of the two variables: enuresis severity and number of parents in the family.



The study shows that, within the bounds of probability, the family environment has an effect on the results from the Bowen therapy expressed as a number of dry nights.

Due to the low number of children with one parent, no correlation was established between the variables. Therefore, in addition to the correlation analysis, a dispersion analysis was performed.

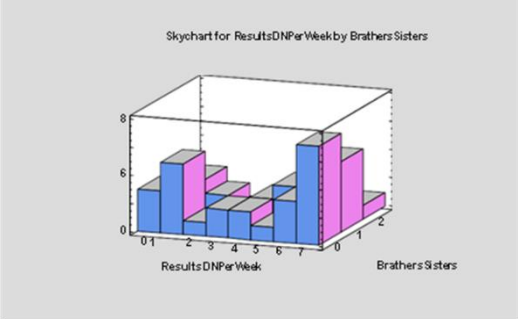
Graph 1A. Results from the juxtaposition of the two variables: enuresis severity and number of parents in the family.



Graph 1A demonstrates that the results obtained for children with one parent exceed the bounds of probability. On average, they have about 2 dry nights per week. In contrast, the mean number of dry nights approaches 5 in children with 2 parents. Because the probability bound is exceeded in children with one parent, it follows that the above factor does have an effect. The small representative sample, however, means that no firm conclusions can be drawn.

III. The third objective was to try and establish a relationship between the child having siblings and the occurrence of nocturnal enuresis.

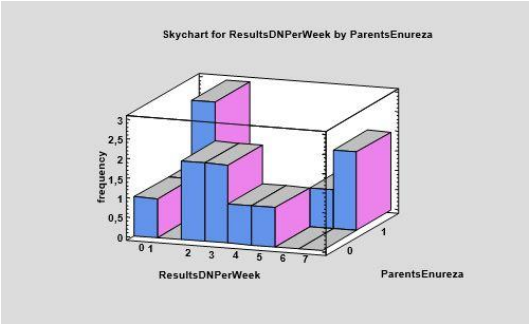
Graph 2. Results from the juxtaposition of the two variables: enuresis severity and having siblings.



While searching for a correlation between the two variables – enuresis severity and having siblings, no dependence was established given the sample length. 19 of a total of 43 participating children had siblings. 5 children had siblings in the group of children experiencing no or an unsatisfactory effect. The number of children having siblings who have experienced a partial effect from the therapy is 3. In the children experiencing a positive outcome from the therapy, the number is 5, and in those experiencing excellent results (7 dry nights), 6 of the children had siblings.

IV. The fourth objective was to check if there is a relationship between the occurrence of nocturnal enuresis and hereditary factors.

Graph 3. Results from the processing of the two variables: enuresis severity and having parents with enuresis.



It is not possible to make an unambiguous inference from the sample data regarding the establishment of a significant difference in the effect from the sessions, taking into consideration family history i.e. having a parent with a history of enuresis, as well as a connection between the variables: enuresis severity and hereditary factors. The reviewed results show that there were children with family history who nevertheless received a grade of 5 or 6. The sample data is therefore insufficient to reach a generalised conclusion.

In children where neither parent reported enuresis in the past, the risk for occurrence of the condition is estimated to be 15%, whereas in families where one parent had enuresis in the past, the risk for children increases to 44%. Said risk increases to 75% for the next generation if both parents have a history of enuresis [7].

V. Is there a relationship between the manifestation of symptoms of nocturnal enuresis and attending kindergarten or school?

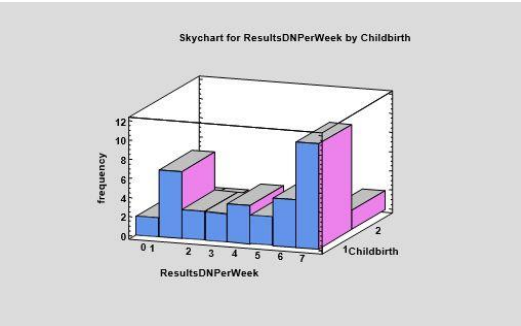
The group of children experiencing no improvement or a marginal improvement after the therapy contained a total of 14 children who attended kindergarten or school. The partial effect group included 7, whereas that of children experiencing a good or an excellent effect from the Bowen therapy included a total of 22 children. Each of the participating children attended kindergarten or school. Due to this characteristic, we were unable to establish a correlation between the two variables within this sample length.

Table 2. Data on juxtaposition of the two variables: number of dry nights and attending kindergarten/school

Number of dry nights	Kindergarten	School	Total
0	2	1	3
	4.65%	2.33%	6.98%
1	4	4	8
	9.30%	9.30%	18.60%
2	2	1	3
	4.65%	2.33%	6.98%
3	3	0	3
	6.98%	0.00%	6.98%
4	2	2	4
	4.65%	4.65%	9.30%
5	3	1	4
	6.98%	2.33%	9.30%
6	3	2	5
	6.98%	4.65%	11.63%
7	6	7	13
	13.95%	16.28%	30.23%
Total	25	18	43
	58.14%	41.86%	100.00%

VI. Our last objective was to try and establish a connection between the type of childbirth (natural or C-section) and the severity of nocturnal enuresis.

Graph 4. Results from studying the relationship between the type of childbirth and the severity of nocturnal enuresis



Data analysis shows that no apparent connection can be established between the severity of the manifestation of enuresis in the studied children and the type of childbirth. Since there were too few children in the group born by C-section, no dispersion analysis was performed.

Similarly, no inference can be formulated regarding the child's water intake and its effect on enuresis severity from the sample length.

Regarding the potential effects of medication, of all 43 studied children, 42 do not take any pharmacological medicine. Parents did not report any additional interventions such as massage, psychotherapy, councelling, ect. to have been performed either. It can therefore be concluded that the results shown were based solely on the Bowen sessions conducted. No inference can be made about the impact (positive or negative) of Bowen procedures on any potential pharmacological interventions due to none being present in this sample or the control group.

Summary:

A total of 13 children, who had undergone a total of 78 sessions, or an average of 6 visits per child, had a grade of 6 – experiencing an excellent effect from the therapy (7 dry nights).

The group of 6 dry nights included 5 children who had undergone a total of 29 procedures, which is an average of 5.8 sessions per child.

The group of 5 dry nights included 4 children who had undergone a total of 22 sessions, the mean number of visits per child being 5.5.

In the group of 4 dry nights, the partial effect group, a total of 23 sessions were conducted, amounting to 5.75 visits per child after averaging.

In the group of 3 dry nights, the mean number of sessions per child is 6.3 (3 children with a total of 19 visits).

In the group of 2 dry nights – 5.66 sessions per child (3 children with a total of 17 visits).

The group of 1 dry night included a total of 8 children and 45 visits, where the number of sessions per child is 5.6 after averaging.

There were a total of 3 children for whom the number of dry nights within the same week was 0, with 22 sessions conducted for the group, which is an average of 7.3 sessions per child.

Discussion: If the children included in the study were put into three groups:

- Group One: 0 to 4 dry nights
- Group Two: 5 to 6 dry nights
- Group Three: 7 dry nights,

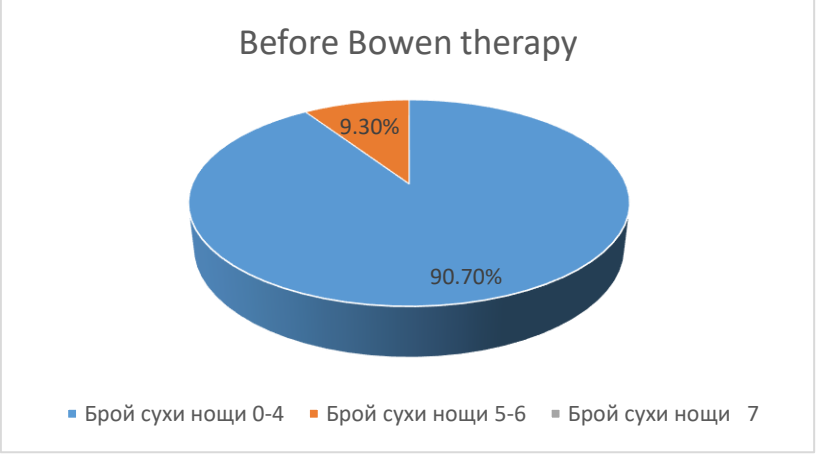
It is immediately evident that a significant reduction has occurred in the children from the first group after receiving Bowen therapy and, in addition, that there were now children with 6 or 7 dry nights per week, whereas no such children were present prior to applying Bowen therapy.

Table 3 Results expressed as number of dry nights – before and after the application of Bowen therapy

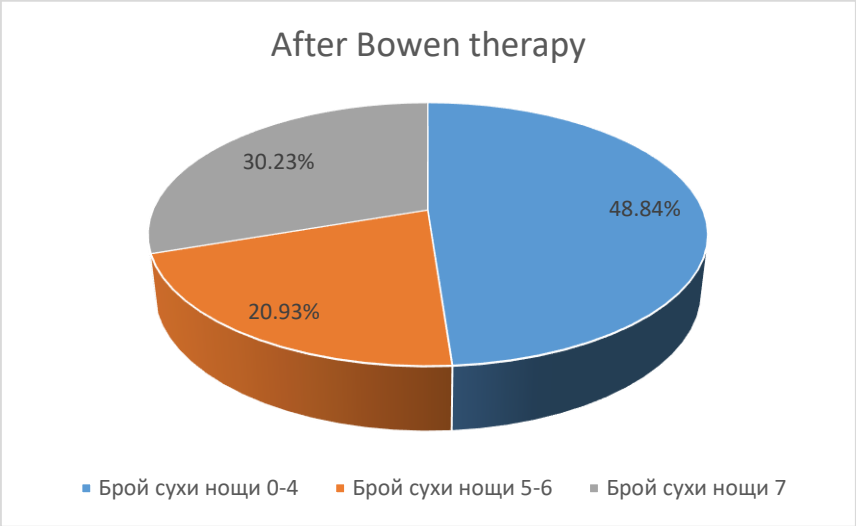
Number of dry nights	Number of children before and after therapy		Number of children before and after therapy as %	
	Before	After	Before	After
0 – 4	39	21	90.7	48.84
5 – 6	4	9	9.3	20.93
7	0	13	0	30.23

The number of children in the group reporting 0 to 4 dry nights per week has been halved after Bowen therapy. In parallel with this, the number of children with 5–6 dry nights per week had tripled. Before applying Bowen treatment, no children had been registered with 7 dry nights, unlike post-therapy reports which put 30.23% of participating children in this group. The results chart can also be presented in the following graphs:

Graph 5. Number of dry nights as percentage – before receiving Bowen therapy



Graph 6. Number of dry nights as percentage – after the application of Bowen therapy



Thorough knowledge of the pathophysiology of the condition is important for making a diagnosis and applying the respective etiological treatment. Furthermore, the etiological cause for the occurrence of enuresis would provide an explanation as to why a part of the children experienced no effect or the effect was insignificant or partial.

This study does not investigate whether children graded 0–2 may have hormonal or other medical reasons for enuresis.

Conclusion: The study results show that Bowen therapy can successfully be included in the treatment plan for children with enuresis. Over 50% of all children with enuresis treated in the study experienced an excellent or a very good effect from the Bowen sessions (6 or 7 dry nights per week). Prior to commencing Bowen sessions, 83.72% of the children participating in the study had three or less dry nights per week. This percentage reduced to 39.54%, after eight Bowen sessions.

It should be mentioned that there were children accomplishing an excellent effect after a larger number of Bowen sessions, but the sample in this study and the percentage values and results cited were only based on the first 8 Bowen sessions.

It has been demonstrated that family environment has an effect on the results from the Bowen therapy expressed as a number of dry nights. Despite differences in the number of children having one parent and children having two

parents, it is evidently clear that single parent children experience a much weaker effect than those with two parents. However, the sample is too short to allow general conclusions.

The sample length does not afford establishing a significant relationship between the severity of nocturnal enuresis and factors such as type of childbirth, having siblings or not, attending kindergarten/school, as well as having a family history of enuresis.

Bowen therapy can be used effectively in the complex treatment of children's enuresis.

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