Designed Nursing Program on Mothers' Knowledge, Practices and its effect on their Children with Nocturnal Enuresis

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Abstract

Background: Nocturnal enuresis is a prevalent and emotionally challenging condition that has a significant impact on psychological, emotional, and social consequences for both the child and their family. **Aim:** to evaluate the designed nursing program on mothers' knowledge, practices and its effect on their children with nocturnal enuresis. **Subject and Method:** Quasi-experimental research design (pre – post program) was utilized in current study. The study was conducted at the Pediatric Outpatient Nephrology and Urology clinic at Minia University Hospital. A purposive sample of 60 mothers of children with Nocturnal Enuresis. **Three tools** were used in study, tool(I) structured interview questionnaire, tool(II) mothers self-reported practices regarding nocturnal enuresis and tool(III) effect of nocturnal enuresis on children. Data was collected over 7 months from the beginning of June 2023 to December 2023. **Results:** One-third of the mothers aged 30-40, with a mean 33.3 ± 7.6 years, have secondary education, three-quarters of them are housewives, and live in rural areas. Regarding the level of mothers' knowledge, more than two-thirds of them had unsatisfactory levels regarding nocturnal enuresis before the training program; however, this decreased to none after three months with a highly significant difference. Before the program, the majority of mothers reported unsatisfactory nocturnal enuresis practices, which dropped to none after three months with substantial statistical significance. **Conclusion: A** designed nursing program effectively enhances mothers' knowledge practices and has a positive effect on their children with nocturnal enuresis. **Recommendations:** Implement ongoing educational programs for mothers to maintain and further improve their knowledge and practices regarding nocturnal enuresis.

***Keywords*:** Children, Designed Nursing Program, Mothers' Knowledge, Mothers' Practices, Nocturnal Enuresis

Introduction:

Nocturnal enuresis (NE) is one of the most common childhood problems that are usually benign and gradually disappear with age **(Wannapaschaiyong & Bunman,2022)**. Generally, by the age of five, children are expected to have developed the ability to regulate their urination, as the capacity of the bladder expands and the neurological pathways in the brain become adept at managing bladder contractions **(Sarabi ,etal.,2022)** .

Nocturnal enuresis (NE) is defined as involuntary urination at night during sleep at least twice a week for a duration of three consecutive months in children older than five years, provided there are no congenital or acquired abnormalities. Enuresis can have a profound effect on children and their families, leading to issues such as shyness, diminished self-esteem, social withdrawal, disrupted sleep patterns, reduced academic performance, and heightened anxiety **(Liao et al., 2024& Alhifthy et al., 2020).**

The International Children's Continence Society has categorized enuresis into two main aspects, each further divided into two types: primary vs secondary and monosymptomatic vs nonmonosymptomatic **(Pillai & Sara, 2024)**.Primary enuresis, representing approximately 80% of cases, is characterized by a child's inability to achieve a sustained period of overnight dryness

lasting over six months. In contrast, secondary enuresis, which constitutes the remaining 20% of cases, occurs when urinary incontinence reemerges following a minimum of six months of consistent nighttime dryness. NE is classified as either monosymptomatic (when the only symptom is the release of urine during sleep) or non-monosymptomatic (when the only symptom is the release of urine during sleep) **(Alanazi et al., 2024; Li et al., 2022).**

Enuresis is considered a multifactorial disease with a strong genetic component because of comorbidities and immaturity of bladder control mechanisms in the central nervous system **(Fernandes et al., 2022).** Nocturnal enuresis has detrimental effects on both affected children and their parents. For the children, it significantly impacts their quality of life due to disrupted nighttime sleep, resulting in daytime drowsiness, fatigue, mood fluctuations, and diminished academic performance.. It can be a source of embarrassment, shyness, isolation, aggression, guilt, low self-esteem causing them to refrain from sleepovers (**El-Sharawy et al., 2022)**. For parents, especially mothers they may become frustrated nervous, angry, ashamed, and may punish their children because of being drained either financially or energetically **(Bulut & Nazir, 2020).**

Pharmacological and non-pharmacological strategies are employed to address the issue of nocturnal enuresis, with the aim of extending the essential duration of uninterrupted restful sleep, enhancing the child's daytime functioning, which encompasses social interactions and academic performance, and alleviating the emotional strain experienced by both children and their families**(Mahmoud et al., 2021).**

Non-pharmacological management strategies encompass various approaches, including the regulation of children's fluid consumption prior to bedtime and implementing a gradual schedule for waking them during the night one or two times to facilitate bathroom use, as part of a dry bed training program. Behavioral modification, motivating children to void, rewarding the children for having dry nights, recording their progress on charts, star charts, and rewarding systems can be used as positive reinforcement to encourage the desired behavior**(Abu El Soud et al., 2023**).

Pediatric nurses play a crucial role as initiators in addressing the NE solution and providing educational services to mothers and their children concerning the NE issue and its management strategies **(Alhifthy et al., 2020)**. The lack of knowledge and practices about NE, however, leads to some parents not seeking medical consultation or treatment for their children. The survey results show that only a portion of parents, approximately ranging from 2.1% to 55%, will seek treatment for their children **(Tsai et al., 2020).** Enuresis education, including its causes and effective treatments, has been shown to change parents' views and misconceptions about the condition. Designed nursing education plays a vital role in improving the care for children and mothers in NE **(Yilmaz and Büyük, 2021).**

Significance of the study

Nocturnal enuresis represents a particularly challenging issue for both children and their parents, leading to considerable social, psychological, and clinical difficulties. This condition significantly impacts the quality of life for both the affected children and their families. In numerous families in Egypt, the concealment of the NE issue is prevalent, largely attributable to social and cultural factors**(Abu El Soud et al., 2023**).

In Egypt, according to a recent Egyptian study conducted by **Abdeen et al. (2024)** to determine the prevalence of nocturnal enuresis among 1587 Egyptian children presenting at the pediatric outpatient department of Ain Shams University Hospital**,** who found the overall prevalence of enuresis among children age group 6 to 16 years was 21%, that consisted of 209 (62.8%) boys and 124 (37.2%) girls. Also, **Salem et al. (2024)** conducted a comparative cross-sectional study among children (5-15 years) attending outpatient family health clinics at Benha City and presented that the prevalence of NE was 16.2%.

Mothers must possess adequate knowledge, essential skills, and effective coping strategies when addressing the challenges faced by their children with NE in order to resolve the issue. It is encouraging to believe that both children with NE and their parents can navigate their lives in a functional and healthy way, provided they have the appropriate time and resources, rather than enduring their struggles in silence or resorting to outdated solutions**(Huang et al., 2022).**

Therefore, providing relevant information on NE is critical for improving children's psychological well-being and quality of life. Several previous studies have emphasized the importance of correcting families' misconceptions, raising their awareness, and ensuring timely medical attention to improve children's and mothers' knowledge and practices. Specifically

designed nursing education is still not fully explored

Aim of the study:

This study aimed to evaluate the designed nursing program on mothers' knowledge, practices, and its effect on their children with nocturnal enuresis.

Research hypotheses:

The current study results would test the following research hypotheses:

HO: No effect of the designed nursing program on mothers' knowledge and self-reported practices among children with nocturnal enuresis.

H1: Mothers who had children with nocturnal enuresis who received the designed nursing program would have a higher level of knowledge and self-reported practices about the care of children with nocturnal enuresis than before.

H2: The Implementation of the designed nursing program would decrease the frequency of bedwetting among children with nocturnal enuresis.

Research Design

Quasi-experimental research design(one group pre-post) was utilized to achieve the aim of the current study.

Setting

The study was conducted at the Pediatric Outpatient Nephrology and Urology Clinic available on the first floor, which consists of two rooms plus one room for nursing and one room for physicians at Minia University Hospital for Nephrology and Urology.

Sample

A purposive sample of 60 mothers of children with nocturnal enuresis who attended pediatric outpatient Nephrology and urology clinic at Minia University Hospital for Nephrology and Urology.

The group was treated as a study group and its control group at the same time.

The determination of the size of the sample is based upon the following sample calculation formula: (http://www.ifad.org/gender/tools/hfs/anthropometry).

$$\frac{t^2 \times p(1-p)}{m^2}$$

$$\frac{(1.960)2 \times 0.09\ (1-0.09)}{(0.05)2} = 60$$

Description:

N=required sample size

t= confidence level at 95 % (standard value of 1.960)

P=estimated prevalence of children diagnosed with nocturnal enuresis in who attended Pediatric Outpatient Nephrology and urology clinic at Minia University Hospital for Nephrology and Urology in 2022 (0.05)

m=margin of error at 5 % (standard value of 0.05)

Inclusion criteria:

- Mothers having children aged 6 to 12 years diagnosed with nocturnal enuresis.
- Mothers willing to participate in the study**.**

Exclusion criteria:

Children with diabetes insipidus or diabetes mellitus, epilepsy, spina bifida, or other physical illness leading to urinary incontinence, and children with intellectual disability.

Tools of Data Collection

Three tools used in the current study as the following:

Tool I: Structured interview questionnaire: It was developed by the researcher after reviewing the recent literature to collect data **(Elmubarak, 2014, Mahmoud, 2021; Bassiouny et al., 2022)**. It consists of the following parts:

Part 1: Socio-demographic characteristics of the mothers, Such as age, education level, occupation, place of residence, marital status, and family income.

Part 2: Bio-demographic characteristics related to the child, Such as age, gender, rank in the family, educational level, number of siblings, positive family history of enuresis, types of enuresis, and age of the child at the onset of enuresis.

Part 3: Mothers' knowledge related to nocturnal enuresis: It assessed mothers' knowledge regarding nocturnal enuresis as definition, Age a child begins to control urination at

night and day, incidence, causes, symptoms, and diagnosis.

Scoring system of mothers'' knowledge:

Three levels of scoring for questions were used as follows: Correct answer was scored (1), don't know or incorrect answer was scored (0). The scores were summed up to give the total score; after that, the score was converted to a percent score, which was transferred into categories as follows: Less than 50% was considered unsatisfactory knowledge, while more than 50% was considered satisfactory knowledge.

Tool (II): Mothers self-reported practices regarding nocturnal enuresis. It was adapted by **Mohamed et al. (2019)** to assess mothers' practices related to nocturnal enuresis as physical care, psychological care, pharmacological therapy, behavioral therapy, behavioral training, and rewarding behavior modification.

The scoring system

The score of mothers' self-reported practices for each item ranged from 0-1. Not done or incorrectly done was scored (0). The scores were summed up to give the total score; after that, the score was converted to a percent score, which was transferred into categories as follows: Less than 50% of the total practice score was considered an unsatisfactory level of practice, while more than 50 % of the total practice score was considered a satisfactory level of practice.

Tool (III): effect of nocturnal enuresis on children :

Part 1 Frequency bedwetting of children with nocturnal enuresis: it was classified into every night, more than once a week, and once a week pre- and post-three months after implementing the program.

Part 2 Consequences of nocturnal enuresis: It consisted of physical effects (rash, urinary tract infections, lethargy and fatigue, loss of appetite, difficulty breathing, headache) and psychological effects (depression, harming friends, weak personality, and isolation).

Tools validity and Reliability: Five experts in pediatric nursing assessed the content validity of the data collection tool. Modifications for the tools are done according to the expert's judgment on the clarity of sentences, appropriateness of content, and sequence of items. Reliability of the tools was performed to confirm the consistency of the tools. The internal consistency was measured to identify the extent to which the items of the tools measured the same concept and correlated with each other by Cronbach's alpha test that revealed good internal reliability for the tools and distributed as follows:

Tool	Cronbach's alpha
Tool I: Structured interview questionnaire about mothers' knowledge regarding nocturnal enuresis	0.75
Tool (II): Mothers self-reported practices regarding nocturnal enuresis	0.80
Tool (III): Effect of nocturnal enuresis	0.70

Pilot study:

After developing the tools, the researcher carried out the pilot study for 10% (6 mothers) of the overall number of participants to evaluate the study tools regarding essential duration for accomplishing them and to assess the instruments' viability, impartiality, application clarity, sufficiency, and content validity. Children who took part in the pilot study were a part of the study overall. According to the results, the required modifications were done.

Ethical considerations:

An initial written primary consent was obtained from the Faculty of Nursing at Minia University, the chairs of the pediatric emergency units, and the director of the pediatric outpatient Nephrology and urology clinic at Minia University Hospital for Nephrology and Urology. The mothers of the children gave informed consent after being briefed about the goal and design of the study to gain their cooperation. Children and their mothers were informed that participation in the study was completely voluntary and that they had the right to leave at any time without having to offer a reason or worry about how to care for their children. The privacy of each mother and her kid was maintained.

Data collection Procedure:

The current data collection procedure is accomplished through the following step: Primary approval was obtained from the ethics committee after that, mothers who met the selection criteria were invited to participate in the study. Then, fill in the personal data and assess their knowledge and self-reported practices regarding the care of their children with nocturnal enuresis on an individual basis pretest and posttest 3 months after implantation of the program. The interview took

place in an outpatient Nephrology clinic at Minia University Hospital for Nephrology and Urology. The researcher asked mothers questions in a questionnaire and marked their responses in a structured interview questionnaire.

The educational program:

The proposed program is conducted through the following phases:

1. **Assessment phase:** This phase aimed to assess mothers' knowledge and self-reported practices about nocturnal enuresis; each mother was interviewed to collect the necessary data. Based on the assessment phase, the program and media were prepared by the researcher in the form of a booklet, videos and posters.

2. **Planning (preparatory phase):** The planning phase included the program strategy time, number of sessions, teaching methods, and media used. In addition, the teaching place and the program facilities were checked for appropriateness. The number of sessions was six sessions, two sessions every week; the duration of each session was 30-45 minutes. Teaching sessions of the program are conducted at the pediatric outpatient nephrology and urology clinic at Minia University Hospital for nephrology and Urology.

Program teaching methods:

A variety of teaching methods were included: lectures, group discussion, feedback, and sharing experiences of the mothers utilized in this program.

3. Implementation of the program.

Oral or written acceptance for participation was obtained from the mothers. The program was implemented for subgroups; each subgroup contained 10 mothers. The same program was implemented for each subgroup of mothers. The program was carried out within about "six" months. The researcher attended from 9 am to 12 pm for 2 days per week in the previously mentioned setting to collect the data and meet mothers and their enuretic children in the waiting area.

The program content has been as follows:

Session 1: It included an introduction about the program (purpose, session's time, session's content).

Session 2: It consisted of an introduction and information about nocturnal enuresis (definition, types of enuresis, etiological factors, signs and symptoms).

Session 3: It focused on how to apply the practice to physical, psychological care, and pharmacological therapy.

Session 4: It focused on how to implement bladder training

Session 5: It focused on how to implement behavior modification

Session 6: It consisted of information about complications and management of enuresis and revising and summarizing the previous session with mothers.

4. Evaluation of the effect of the program:

Assessment of mothers was done 2 times using the same study tools to investigate whether the change persisted or not. One assessment was done before the program, another after three months of the program implementation, and data was collected over 7 months from the beginning of June 2023 to December 2023.

Statistical analysis

The collected data were tabulated & statistically analyzed using a software program and statistical package for social science (SPSS 25.0) to evaluate nurses under study. The statistical analysis included percentage (%), mean, and stander deviation (SD). Fisher's exact test is used to detect differences between more than two variables, and the sample size is small. Graphs were done for data visualization using Microsoft Excel. A correlation test and P - value of ≤ 0.05 indicates a significant result, while a P value > 0.05 indicates a non-significant result.

Results

Table (1): Distribution of the studied mothers according to their demographic data (n = 60).

Demographic data	The studied mothers (n= 60)	
	No.	%
Age/ years		
• 20 to < 30	23	38.3
• 30 to < 40	24	40.0
• 40 to < 50	13	21.7
Mean ± SD	33.3 ± 7.6 Year	
Educational level		
• Read and write	14	23.3
• Primary	4	6.7
• preparatory	7	11.7
• Secondary	26	43.3
• University	9	15.0
Mother work		
• Working outside house	14	23.3
• Housewives	46	76.7
Place of Residence		
• Rural	46	76.7
• Urban	14	23.3
Marital status		
• Married	56	93.3
• Divorced	4	6.7
Family Income		
• Enough	40	66.7
• Not enough	20	33.3

Table (1) shows that 40.0% of the studied mothers were aged between 30 and < 40 years, with a mean of 33.3 ± 7.6 years; 43.3% of them had secondary schools, and 76.7% of them were housewives and lived in a rural area, respectively.

Table (2): Distribution of the children according to their demographic data (n = 60).

Items	No.	%
Child's Age / years		
• 6 to < 8	23	38.3
• 8 to < 10	14	23.4
• 10 to < 12	23	38.3
Mean ± SD	9.0 ± 1.8	
Gender		
• Boys	32	53.3
• Girls	28	46.7
Child Rank in the Family		
• First	21	35.0
• Second	8	13.3
• Third	17	28.3
• Fourth	14	23.4
The educational level of the child		
• 1st	7	11.7
• 2nd	16	26.6
• 3rd	10	16.7
• 4th	4	6.7
• 5th	12	20.0
• 6th	11	18.3
No. of sibling		
• One	18	30.0
• Two	18	30.0
• Three	11	18.3
• Four	13	21.7

Table (2) presents that 38.3% of the studied children were aged between 6 - < 8 and 10 – 12 years, respectively, with a mean of 9.0 ± 1.8 years; 46.7% of them were girls, and 35.0% of them ranked first, and 26.6% of them enrolled in 2nd primary school.

Table (3): Distribution of the children according to their family history, type, and child age at the onset of nocturnal enuresis (n = 60).

Items	No.	%
Family history of enuresis		
• Yes	32	53.3
• No	28	46.7
Type of nocturnal enuresis		
• Primary	55	91.7
• Secondary	5	8.3
Child age at the onset of nocturnal enuresis		
• 6-8	53	88.3
• 8 – 10	7	11.7

Table (3) evidence that 53.3% of the studied children had a positive family history regarding nocturnal enuresis, as well as 91.7% of them had primary nocturnal enuresis, which appeared at 6 – 8 years of age (88.3%).

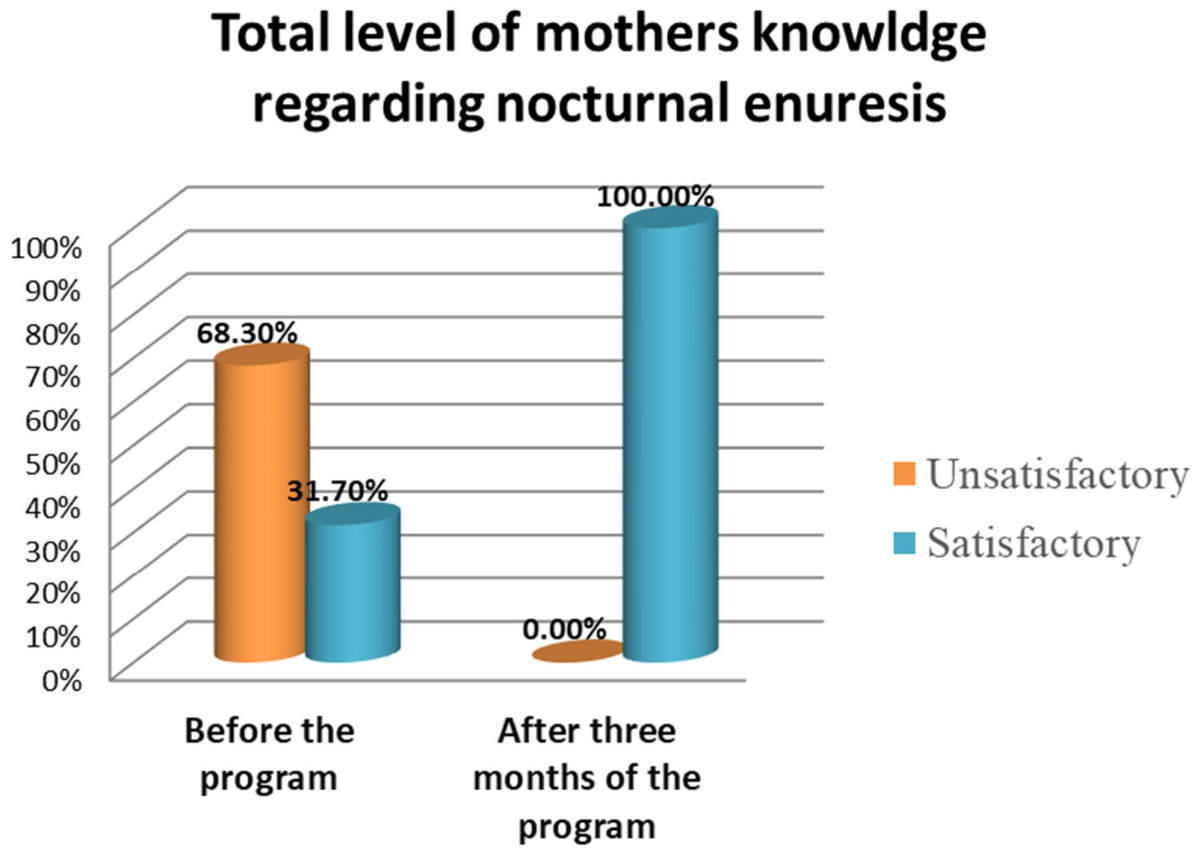

Figure (1): Percentage distribution of the studied mothers according to their total knowledge level regarding nocturnal enuresis before and after three months of the program (n = 60).

Figure (1) illustrates that 68.3% of the studied mothers had unsatisfactory knowledge regarding nocturnal enuresis before the program decreased to 0.0% after three months with a highly statistically significant difference (P value < 0.001).

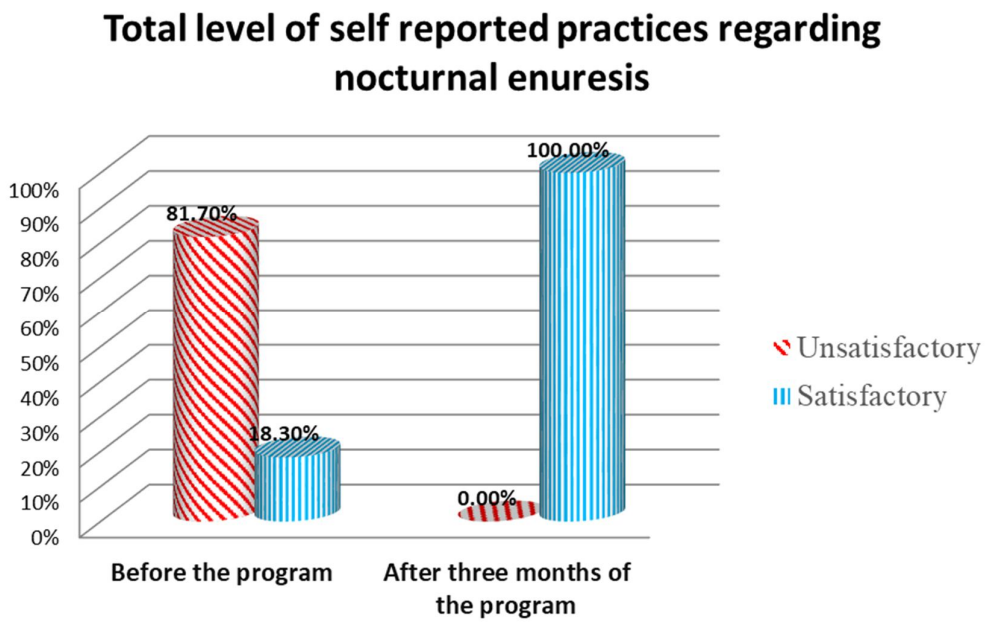

Figure (2): Percentage distribution of the studied mothers according to their total self-reported practice level regarding nocturnal enuresis before and after three months of the program (n = 60).

Figure (2) illustrates that 81.7% of the studied mothers had unsatisfactory self-reported practice regarding nocturnal enuresis before the program decreased to 0.0% after three months with a highly statistically significant difference (P value < 0.001).

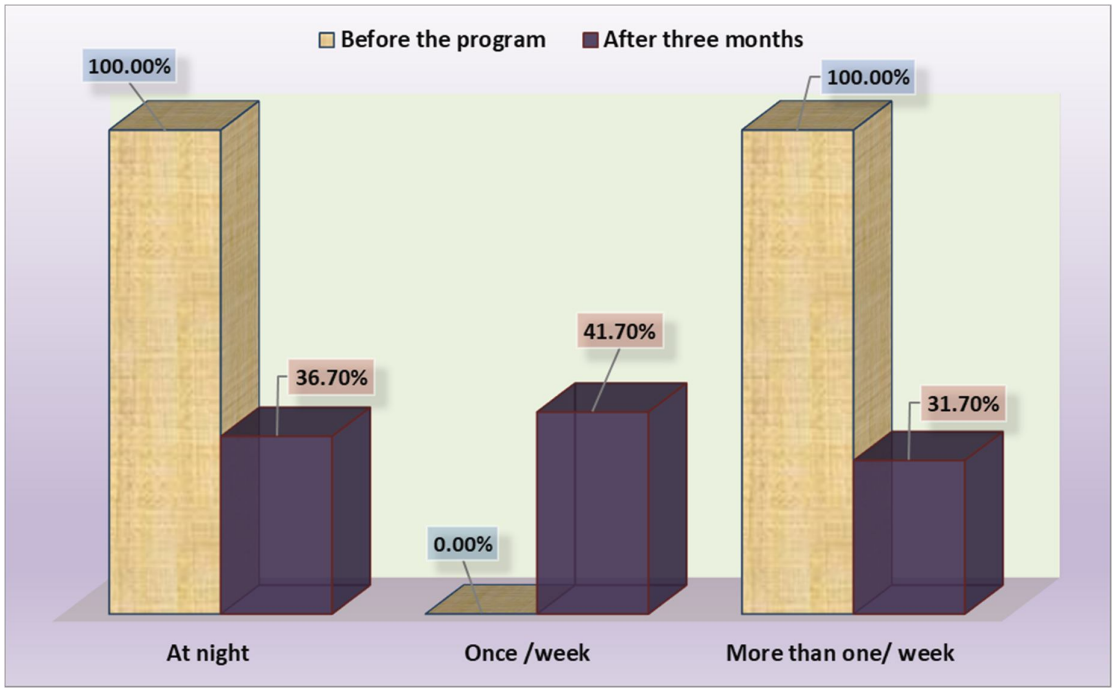

Figure (3): Distribution of the studied children according to their frequency of nocturnal enuresis before and after three months of the program (n = 60).

Figure (3) illustrates decreased frequencies of nocturnal enuresis among the studied children after three months of the program. 100.0% of the studied children had nocturnal enuresis more than once/ week before the program decreased to 31.7% after three months, and 41.7% of them had nocturnal enuresis once / week after three months, with highly statistically significant differences.

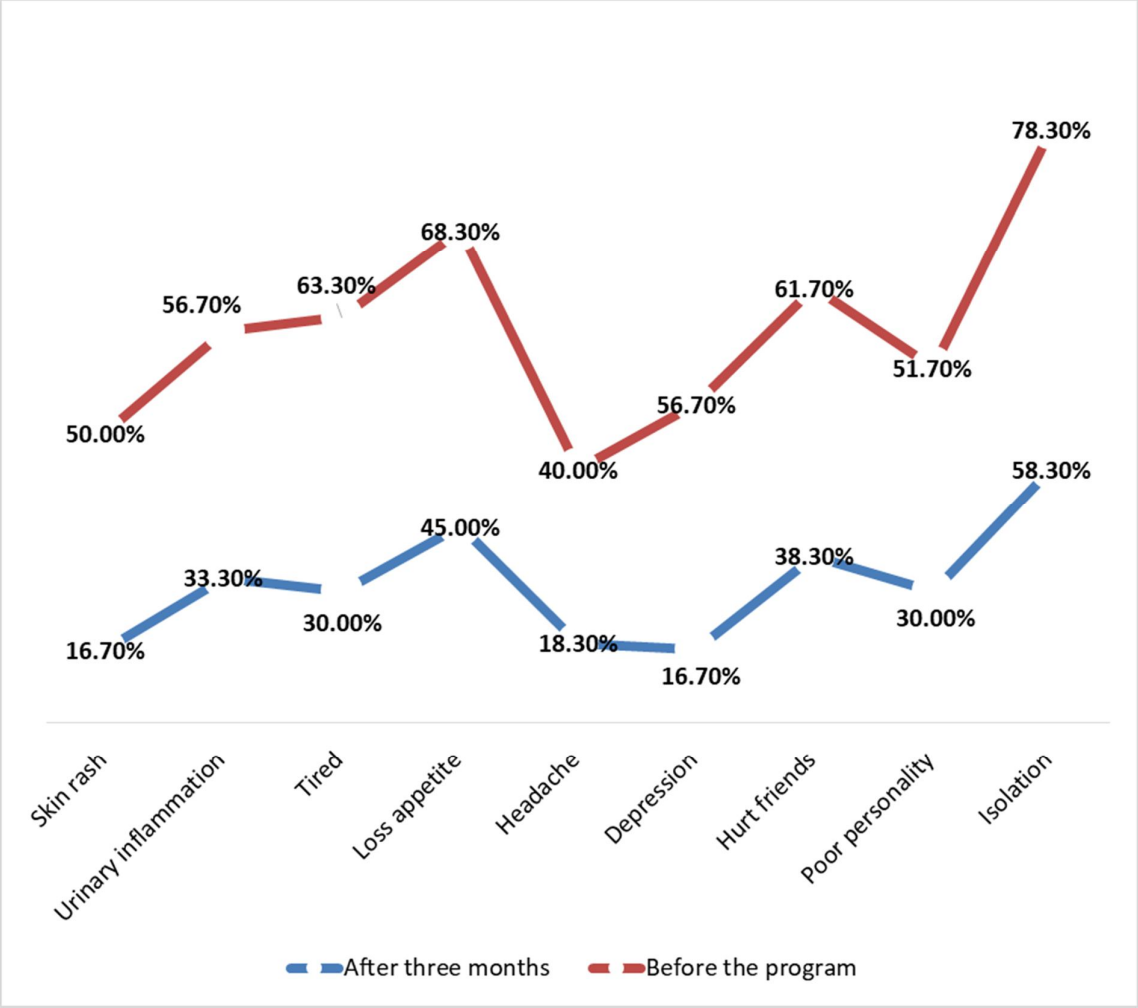

Figure (4): Distribution of the studied children according to their effect of nocturnal enuresis before and after three months of the program (n = 60).

Figure (4) illustrates the decreased effect of nocturnal enuresis among the studied children after three months of the program. 78.3% of the studied children suffered from isolation before the program decreased to 58.3% after three months, 68.3% of them had a loss of appetite before the program decreased to 45.0% after three months, and 63.3% of them were tired before the program decrease to 30.0% after three months with highly statistically significant differences.

Table (4): Relations between the total knowledge level of the studied mothers and their demographic data before the program (n= 60).

Items		Total knowledge level before the program					Significant test	
		Unsatisfactory		Satisfactory			Fisher test	P value
	No.	No.	%	No.	%			
Mother work								
• Working outside house	14	10	71.4	4	28.6		0.081	0.776
• Housewives	46	31	67.4	15	32.6			
Place of residence								
• Rural	46	29	63.0	17	37.0		2.549	0.110
• Urban	14	12	85.7	2	14.3			
Marital status								
• Married	56	38	67.9	18	32.1		0.088	0.767
• Divorced	4	3	75.0	1	25.0			
Family Income								
• Enough	40	26	65.0	14	35.0		0.616	0.432
• Not enough	20	15	75.0	5	25.0			

Percentage calculated by row

Table (4) represents that there are no statistically significant differences between the total knowledge level of the studied mothers and their demographic data before the program.

Table (5): Relations between the total self-reported practice level of the studied mothers and their demographic data before the program (n= 60).

Items		Total self-reported practice level before the program			Significant test	
		Unsatisfactory		Satisfactory	Fisher test	P value
	No.	No.	%	No.	%		
Mother work							
• Working outside house	14	14	100.0	0	0.0	4.099	0.043*
• Housewives	46	35	76.1	11	23.9		
Place of residence							
• Rural	46	36	78.3	10	21.7	1.527	0.217
• Urban	14	13	92.9	1	7.1		
Marital status							
• Married	56	45	80.4	11	19.6	0.962	0.327
• Divorced	4	4	100.0	0	0.0		
Family Income							
• Enough	40	34	85.0	6	15.0	0.891	0.345
• Not enough	20	15	75.0	5	25.0		

*Statistically significant differences at < 0.05 percentage calculated by row

Table (5) shows that all mothers who are working outside the house have unsatisfactory self-reported practice before the program with a statistically significant difference, with P value < 0.043. On the other hand, no statistically significant differences were found between the total self-reported practice level of the studied mothers and their place of residence, marital status, and family income before the program.

Table (6): Correlation between total knowledge and self-reported practices scores of the studied mothers with their age, educational level, and child age at the onset of nocturnal enuresis

Items		Before the program		After three months of the program	
		knowledge	Self-reported practice	knowledge	Self-reported practice
Mother age	r	**0.270-**	0.045	**0.344-**	.036
	P - Value	**0.037***	0.735	**0.007****	.786
Educational level	r	**0.754****	0.064	**0.741**	-.060-
	P - Value	**0.0001****	0.626	**.0001****	.646
Child age	r	-.099-	0.050	-.234-	.110
	P - Value	0.451	0.707	0.071	.404
Knowledge	r	……	**0.829**	……	**0.604**
	P - Value	……	**0.029***	…..	**0.012***

**statistically significant at < 0.01

Table (6) presents that strong positive association between the educational level of the studied mothers and their knowledge regarding nocturnal enuresis before and after three months of the program (r=0.754; P – value < 0.0001 and r=0.741; P value< 0.0001 respectively). Also, a negative association between the mother's age and their knowledge regarding nocturnal enuresis before and after three months of the program (r= -0.270; P – value < 0.037 and r= - 0.344; P value< 0.007 respectively).

Discussion:

The Current study findings evidenced that more than half of the studied children had a family history regarding nocturnal enuresis; most of them had primary nocturnal enuresis and the majority of them had this disease begin at 6 – 8 years. This finding was in agreement with **Ahmed & Mohammed (2019),** who mentioned that school-age children had enuresis for more than three years and suffered from primary enuresis. **From a researcher point of view,** school-age children entering school may be a stressful event for them.

Regarding the family history of nocturnal enuresis, current study results were supported by the study by **Mahmoud et al. (2021**), which concluded that most of the children had a positive family history of enuresis. This result may be attributed to the presence of genetic factors in the occurrence of nocturnal enuresis.

The current study result illustrated that half of the studied children had suffered from bullying. The finding was consistent with **Owino et al. (2019),** who studied the psychological experiences of students who have nocturnal enuresis with their peers in boarding secondary schools in Kenya and concluded that children with nocturnal enuresis might be ridiculed and hated by peers and have low self-esteem, which could affect their capacity to communicate and obstruct their improvement in their psychological progress. Also, the study by **Ahmed et al. (2022)** showed that children with enuresis were frequently having psychological and emotional concerns. Fear of being noticed by others is usually associated with emotional suffering for children and their caregivers. Nearly one-third of the sample often feel upset, hurt, fearful, scared, and sad.

The current study findings illustrated that more than two thirds of the studied mothers had unsatisfactory knowledge regarding nocturnal enuresis before the program, decreasing to none of them after three months with a highly statistically significant difference.

These findings were consistent with the study by **Abu-Elsoud. et al., (2023).** revealed that the minority of the studied parents versus all of them and most of them had good total knowledge scores pre-, immediate post, and post-3 months of program implementation, respectively, with a statistically significant difference.

Also, El-Kersh (2022) noticed that all of the mothers had poor knowledge before the learning package, while about two-thirds of them had good knowledge immediately and one month after the learning package, respectively, with a statistically significant difference.

From the researchers' point of view, these results return to the studied parents were in a high need for being knowledgeable regarding NE, and the educational program was successful in satisfying their learning needs through knowledge acquisition and retention as it was simple and easy.

The current study findings illustrated that the majority of the studied mothers had unsatisfactory self-reported practices regarding nocturnal enuresis before the program, decreasing to none after three months with a highly statistically significant difference. **From the researcher point of view,** applying the educational program gives parents an opportunity to enhance and strengthen their practices, which in turn leads to changes in the care given to their enuretic children and affects their children's outcomes.

The present study results were congruent with the study by **Khalil et al. (2021),** who studied "Awareness of parents having school-age children with enuresis" cleared that total levels of practice of parents having school-age children with enuresis show that more than two-thirds of parents are incompetent practices at pretest.

Also, the current study results were consistent with the study by **Mahmoud et al. (2021)** illustrated that most of the mothers showed an unsatisfactory total score of practices related to nocturnal enuresis before intervention. After three months of educational program implementation, more than two-fifths of them showed a satisfactory level of practice compared to more than two-thirds post six months of intervention.

Regarding decreased frequencies of nocturnal enuresis among the studied children after three months of the program. The current study findings illustrated that all of the studied children had nocturnal enuresis more than one/ week before the program decreased to nearly one-third after three months, and more than two-fifths of them had nocturnal enuresis once / week after three months with highly statistically significant differences.

These findings were in the same line with **Sá et al. (2021)** about psychological intervention with parents improving treatment results and reducing punishment in children with enuresis: a randomized clinical trial. Proved that before treatment, children in the control group had a greater number of dry nights than those in the experimental group. However, after treatment children in the experimental group presented with a higher percentage of dry nights compared to children in the control group.

From the researchers' point of view, a marked decrease in the frequency of bedwetting might be due to the improvement in parents' knowledge and reported practices after implementing the intervention, decreased the negative implications of NE on both parents and their children, and increased the positive ones which in turn led to positive health outcomes among the studied children as an indicator of our program success.

The Present study results illustrated the decreased effect of nocturnal enuresis among the studied children after three months of the program. More than three-quarters of the studied children suffered from isolation before the program decreased to more than half after three months; more than two-thirds of them had loss of appetite

before the program decreased to more than two fifth after three months and more than two-thirds of them had tried before the program decreased to more than a quarter after three months, with highly statistically significant differences.

The findings of the current study were congruent with the study by **Abu Elsoud (2023)** concluded that, over and above, it was illustrated from the present study results that NE had negative implications on the studied children pre-program compared to three months post program implementation. NE negatively influences the interpersonal relationships, self-esteem, and social performance of affected children which can increase the risk for emotional and behavioral problems. As well as, NE is an embarrassment source for children causing them to refrain from sleepovers.

As regards The relations between total knowledge and self-reported practices level of the studied mothers and their demographic data.

The study results showed that there were no statistically significant differences between the total knowledge level of the studied mothers and their demographic data before the program.

These results contradicted the study by **Albadrani et al. (2024**), which clarified that there was a significant correlation between age, gender, and educational level and whether the participants knew anything about enuresis in children with the awareness score NE. The participants aged less than or equal to 35 years had a higher awareness score than those aged more than 35 years. The participants with university degrees had a higher awareness score than those with less than a university degree.

The Current study findings showed that all mothers who work outside the house have unsatisfactory self-reported practice before the program with a statistically significant difference. On the other hand, no statistically significant differences were found between the total self-reported practice level of the studied mothers and their place of residence, marital status, and family income before the program.

These results were contradicted by the study **by Mahmoud et al. (2021)** reveals negative correlations between mothers‟ work status and practices of enuresis, which means working mothers are more knowledgeable and skillful compared with housewives.

As regards the correlation between total knowledge and self-reported practices scores of the studied mothers with their age, educational level, and child age at the onset of nocturnal enuresis

The current study results represented that there were no statistically significant differences between the total knowledge level of the studied mothers and their demographic data before the program.

The present study findings were contradicted with the study by **Alarfaj et al. (2024),** who studied parental perception of nocturnal enuresis in a local region of Saudi Arabia, indicated that having a higher level of education was significantly associated with a higher knowledge score. Also, having an age below 25 years and having more than three children was associated with a higher level of awareness about the treatment of NE.

The current study results showed that all mothers who work outside the house have unsatisfactory self-reported practices before the program with statistically significant differences. On the other hand, no statistically significant differences were found between the total self-reported practice level of the studied mothers and their place of residence, marital status, and family income before the program.

The study by **Essawy et al. (2018)** was congruent with the current study results and concluded that more than two-thirds of the study subjects were working where working could hinder the quality management of caregivers as they spend most of their time outside their houses.

These results were contradicted with the study by **Mahmoud et al. (2021)** reveals negative correlations between mothers‟ work status and practices of enuresis, which means working mothers are more knowledgeable and skillful compared with housewives.

The present study presented that there was a strong positive association between the educational level of the studied mothers and their knowledge regarding nocturnal enuresis before and after three months of the program. Also, negative association between the mother age and their knowledge regarding nocturnal enuresis before and after three months of the program.

These findings were supported with the study by **Albadrani et al. (2024),** who studied the Knowledge and Awareness of Adults towards Nocturnal Enuresis in Children in the Medina Population. Concluded that there was a significant correlation between age and educational level. The participants aged less than or equal to 35 years had a higher awareness score than those aged more than

35 years. The participants with university degrees had a higher awareness score than those with less than a university degree.

The study by **Mahmoud et al. (2021)** cleared that there was an association between education and knowledge of enuresis, as well as a negative correlation between a child's age and attitude toward enuresis. Also, the current study results were supported by the study by **Mohamed et al. (2021**), which cleared that individuals with higher educational qualifications had significantly more prior knowledge about enuresis than those with lower educational qualifications.

Education is one of the important things needed so that mothers can be more responsive in the development of their children and help determine whether or not a person can easily absorb and understand the information they get.

The current study finding proved that it shows that positive association between the total knowledge scores of the studied mothers and their total practices regarding nocturnal enuresis before and after three months of the program.

These results were supported with **El Kersh et al. (2022**); it was noticed that there was a positive correlation with a statistically significant difference between immediate and one month levels of total mothers' knowledge and practices after the learning package.

Regarding the relations between total knowledge and self-reported practices level of the studied mothers and their demographic data. The study results represent no statistically significant differences between the total knowledge level of the studied mothers and their demographic data before the program.

These results were contradicted with the study by **Albadrani et al. (2024**) *cleared that* there was a significant correlation between age, gender, and educational level and whether the participants knew anything about enuresis in children, with the awareness score NE. The participants aged less than or equal to 35 years had a higher awareness score than those aged more than 35 years. The participants with university degrees had a higher awareness score than those with less than a university degree.

The Current study findings showed that all mothers who work outside the house have unsatisfactory self-reported practice before the program with statistically significant differences. On the other hand, no statistically significant differences were found between the total self-reported practice levels of the studied mothers and their place of residence, marital status, and family income before the program.

These results were contradicted by the study by **Mahmoud et al. (2021)** reveals negative correlations between mothers' work status and practices of enuresis, which means working mothers are more knowledgeable and skillful compared with housewives.

As well as the correlation between total knowledge and self-reported practice scores of the studied mothers with their age, educational level, and child age at the onset of nocturnal enuresis. The current study results represented that there were no statistically significant differences between the total knowledge level of the studied mothers and their demographic data before the program.

These findings were contradicted with the study by **Alarfaj et al. (2024),** who studied parental perception of nocturnal enuresis in a local region of Saudi Arabia, which indicated that having a higher level of education was significantly associated with a higher knowledge score, Also, having an age below 25 years, and having more than three children were associated with a higher level of awareness about the treatment of NE.

The current study results showed that all mothers who are working outside the house have unsatisfactory self-reported practices before the program with a statistically significant difference. On the other hand, no statistically significant differences were found between the total self-reported practice levels of the studied mothers and their place of residence, marital status, and family income before the program.

These results were contradicted with the study **by Mahmoud et al. (2021)** revealed negative correlations between mothers‟ work status and practices of enuresis, which means working mothers are more knowledgeable and skillful compared with housewives.

The present study results presented that there was a strong positive association between the educational level of the studied mothers and their knowledge regarding nocturnal enuresis before and after three months of the program. Also, negative association between the mother age and their knowledge regarding nocturnal enuresis before and after three months of the program.

The study findings were supported with the study by **Albadrani et al. (2024),** who studied the Knowledge and Awareness of Adults towards Nocturnal Enuresis in Children among the Medina Population. Concluded that there was a significant

correlation between age and educational level. The participants aged less than or equal to 35 years had a higher awareness score than those aged more than 35 years; the participants with university degrees had a higher awareness score than those with less than a university degree. Education is one of the important things needed so that mothers can be more responsive in the development of their children and help determine whether or not a person can easily absorb and understand the information they get.

The current study finding proved that there is a positive association between the total knowledge scores of the studied mothers and their total practices regarding nocturnal enuresis before and after three months of the program.

Those results were supported by **El Kersh et al. (2022),** who noticed that there was a positive correlation with a statistically significant difference between immediate and one mother, respectively, between levels of total mothers' knowledge and practice after the learning package.

Conclusion

More than two-thirds of the studied mothers had unsatisfactory knowledge regarding nocturnal enuresis before the training program; however, this decreased to none after three months, with a highly significant difference. Before the program, the majority of the studied mothers reported unsatisfactory nocturnal enuresis practice, which dropped to none after three months with substantial statistical significance.

The designed nursing program significantly reduced the effects of nocturnal enuresis among the studied children. Specifically, the percentage of children suffering from isolation decreased from three-quarters to more than half, loss of appetite reduced from two-thirds to two-fifths, and tiredness dropped from two-thirds to nearly one-third post-three months, all with highly statistically significant differences. The finding demonstrates the program's effectiveness in alleviating the negative impacts of nocturnal enuresis on children's well-being.

Recommendations

Based on the findings of the present study, the following recommendations are suggested:

Recommendations for clinical practice:

- Implement ongoing educational programs for mothers to maintain and further improve their knowledge and practices regarding nocturnal enuresis.
- Establish regular support and monitoring systems, such as follow-up sessions and peer support groups.
- Educate mothers on the importance of avoiding caffeinated beverages for their children, particularly in the evening. Caffeine can contribute to increased urine production and disrupt sleep patterns.
- Implement structured behavioral training programs for mothers.

Recommendations for Researches

- Conduct studies on the psychological effects of providing privacy during voiding on children with nocturnal enuresis.
- Examine how maintaining confidentiality about a child's condition can affect their mental health and social interactions. Research can focus on strategies to reduce stigma and ensure a supportive environment for affected children.
- Examine the effectiveness of educational programs that teach mothers about the importance of following the prescribed therapy regimen and attending follow-up appointments with physicians.

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