

## Effect of Bladder Training and Pelvic Floor Muscle Exercises on Urge Control among Patients with Overactive Bladder Syndrome.

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### **Abstract**

**Background:** Overactive bladder (OAB) is a major public health problem affecting millions of men and women worldwide. It is an embarrassing condition with a negative effect on quality of life. So, a combination of pharmacological and behavioral therapy is required to successfully manage OAB symptoms. **Objective:** Determine the effect of bladder training and pelvic floor muscle exercises on urge control among patients with overactive bladder syndrome. **Settings:** The study was carried out at the Urology Outpatient Clinic of Etay Elbarood General Hospital , Elbehaira government, Egypt. **Subjects:** A convenient sample of 60 adult patients, who were divided into two equal groups (study and control group) were recruited for the study. **Tools:** three tools were used. Tool I: "Socio demographic and clinical data structured interview schedule ". Tool II: "patient's knowledge regarding overactive bladder& symptoms assessment and tool III" Overactive Bladder Patients' life style". **Results:** There was a significant improvement in knowledge &OAB symptoms for the study group patients more than in the control group ( $P=(<0.001^*)$  post program application. Furthermore ,the majority of the study groups exhibited satisfactory levels of life style due to reduced overactive bladder symptoms ( $P= <0.001^*$ ). **Conclusion:** Educational programs have been proven to be effective in reducing episodes of urgency for patients in the study group than in the control group. **Recommendations:** An educational program should be developed for overactive bladder patients, and the developed illustrated booklet should be available and distributed to all patients with overactive bladder syndrome.

**Keywords:** Bladder training, Pelvic floor muscle, Urge control, Overactive bladder syndrome.

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### **Introduction**

Overactive bladder (OAB) is a very common disorder that affects millions of people worldwide. OAB impacts on quality of life (QOL) by interfering with emotional well-being, social and sexual relationships, and work productivity. (Mourad et al .,2019). In 2021 Mullen& Kaplan mentioned that OAB affected over 500 million people worldwide. In 2022 Santander et al mentioned that the worldwide prevalence of OAB ranges from 11.8% to 35.6%. Also, the worldwide prevalence of OAB is predicted to continue to increase because of overall population growth

and aging. (Mullen& Kaplan., 2021, Santander et al .,2022).

The most accurate and accepted worldwide definition at this moment is that of the International Consultation on Incontinence Research Society (ICI-RS) since 2014 which state that OABS is characterized by urinary urgency, with urinary incontinence (OAB wet) or without (OAB dry), usually with increased daytime frequency and nocturia, if there is no proven infection or other obvious pathology (Corcos et al., 2017; Funada et al., 2023; Linder et al., 2020; Scarneciu et al., 2021).

Pelvic floor muscle exercises are one of the important modalities for treating OAB. The rationale of pelvic floor muscle exercise is to improve the timing of contractions, the strength of the pelvic floor muscles and tone. Thus, voluntary pelvic floor muscle contractions are used to control the symptoms of urgency and urge incontinence. After inhibiting the urgency to void and the detrusor contraction, the patient can reach the toilet in time to avoid urine leakage. PFME has shown a success rate in urge control and has also shown promising results for OAB in recent times. (García-Perdomo et al., 2018, Badda et al., 2019).

Bladder training in people with OAB helps to control urgency by diverting their attention with performing mental arithmetic or pelvic floor muscle contractions and helping them to relax with deep breathing activities and gradually prolonging the voiding interval by 15 minutes. Eventually, the patient may be able to void every three to four hours without the frequent urge to urinate. (Funada et al., 2023).

Bladder training is occasionally combined with other therapies, such as pelvic floor muscle exercises (PFME) and pharmacotherapy, for an additive effect. In clinical practice, bladder training and PFME are prescribed in combination. European Association of Urology (EAU) guidelines introduced both therapies as "behavioral and physical therapies" Pharmacotherapy, especially anticholinergics, is also combined with bladder training in clinical practice (Funada et al., 2023).

### ***Aims of the Study:***

This study aimed to determine the effect of bladder training and pelvic floor muscle exercises on urge control among patients with overactive bladder syndrome.

### ***Research hypotheses***

Patients who practice bladder training and pelvic floor muscle exercises will experience less urgency episodes than those who don't practice it.

## ***Materials and Method***

### ***Materials***

***Design:*** A quasi experimental research design was utilized to conduct this study.

***Settings:*** This study was conducted at the Urology Outpatient Clinic of Etay Elbarood General Hospital, This clinic is affiliated with general organizations for teaching hospitals and institutes that provide public non paid services. ( It consists of 1 room that contains 1 bed, with 1 doctor and 1 nurse and they work 6 days per week from Saturday to Thursday, starting from 8 :00am to 1:00 pm )

***Subjects:*** A convenient sample of 60 adult patients admitted to the above mentioned setting and diagnosed with overactive bladder were recruited for the study. They were divided randomly into two equal groups; the first was the study group ( 30 patients )who received the bladder training and pelvic floor muscle exercises program. The second group was the control group (30 patients) who were exposed to routine hospital care only. The study sample was selected based on ( The Epi info -7) program using the following parameters; Total population size 70, Prevalence rate 50%, Acceptable error of 5%, Confidence coefficient 95%, The minimal sample size was 60 patients. Patient with urinary tract infection were excluded from the study.

***Tools:*** To collect the necessary data for the study three tools were used:

**Tool I: Socio-demographic and clinical data structured interview schedule:** This tool was developed to assess patients' socio-demographic and clinical data, it included two parts :-

**Part I: Patients' Socio-demographic data:** This part of the tool was developed by the researcher based on relevant literature and included:-Socio-demographic characteristic such as age, sex, marital status, level of education, occupation, and residence area.

**Part II: Patients' Clinical Data:** This part of the tool included information related to; past & present medical history, and chief complaints such as: past and

present (medical ,surgical, obstetric and family history, chief complaints such as; onset of symptoms, and current treatment.

**Tool II: Overactive Bladder Patients' knowledge.** This tool was developed by the researcher in Arabic language based on relevant literature and was used to assess baseline knowledge of patients about the disease as well as, to identify patients learning needs as pre-requisites for planning the bladder training and pelvic floor muscle exercises program it included two parts as follows:

**Part I: Knowledge Assessment:**

This part of the tool was used to assess patient's knowledge related to overactive bladder diseases such as (definition, causes, risk factors, treatment), knowledge related to toilet behavior, knowledge related to healthy behaviors, and lifestyle patterns related to overactive bladder diseases such as,(healthy diet, fluid management ,weight control, smoking cessation, and bowel habits regulation) and knowledge related to bladder training and pelvic floor muscle exercises program such as (definition, benefits, cautions during exercises, duration of PFME).

**A scoring system of patient's knowledge was done as follows,** each question had a group of answer points, each correct and complete answer had two grades, and each correct and incomplete answer had one grade. However, incorrect answer or did not know was scored as zero. The scores obtained for each set of questions were summed up and the total scores for patient's knowledge were calculated. The total knowledge score was categorized as follows; satisfactory  $\geq 50\%$ , unsatisfactory  $< 50\%$ .

**Part II: Overactive Bladder Symptoms Assessment:** This part of the tool included questions to measure which Overactive Bladder (OAB) symptoms the patients have and how many symptoms bother them. It was adopted based on the Urology Care Foundation 2018 to assess overactive bladder symptoms before and after the implementation of pelvic floor muscle

exercises and bladder training. It included mainly 5 items related to OAB symptoms including; Urgency, Urgency Incontinence, Incontinence, Frequency, and Waking to urinate.

**In relation to patients' Overactive Bladder Symptoms,** each patient response score was ranged from 0 to 5.

**For questions about urgency and urgency incontinence:-**

Zero = not at all, 1 = Occasionally, 2 =About once a day, 3 =About three times a day, 4 = About half of the time, 5 = Almost always.

**For question about incontinence:-**

None=0, Drops=1, 1 Tea spoon =2, 1 Table spoon=3 , 1/4 Cup=4 ,Entire bladder=5.

**For questions about frequency:-**

1-6 times =0, 7,8 times=1 9,10 times=2 11,12 times=3,13,14 times=4, 15 or more times =5.

**For questions about nocturea**

None = 0, 1 time=1, 2 times=2, 3 times=3, 4 times=4, 5 or more times =5.

**A scoring system of patient's knowledge about OAB symptoms was done as follows,** The total OAB symptoms score was judged using a scoring system ranged from 0 to 25 where zero = no symptoms, 25= most severe symptoms which categorized as follows:

- 0 = No symptoms,
- 5 to less than 10= Mild symptoms,
- 10 to less than 15= Moderate symptoms,
- 15 to less than 20 = Severe symptoms.
- 20 to 25 =Most severe symptoms.

**Tool III: Overactive Bladder Patients' lifestyle.** It was developed by the researcher to measure the frequency of self-reported health promoting lifestyle practices performed by the overactive bladder patients, through subscales that measure healthy lifestyle practices such as; healthy diet, fluid management, caffeine reduction, bladder irritants, weight control, managing constipation, smoking cessation, bowel habits regulation and periodic follow up.

**A scoring system of patients' lifestyle practices** was scored on 3 points Likert scale as follow; (0=Never, 1= Sometimes, and 2= Always). The total health promoting lifestyle practices score was judged by using a scoring

system as follows; satisfactory  $\geq 50\%$ , unsatisfactory  $< 50\%$ .

## Method

The study was accomplished as follows: Approval from the Research Ethics Committee, Faculty of Nursing- Alexandria University, was obtained. Approval to conduct the study was secured from the hospital administrator after an explanation of its purpose. The tools of the study were developed by the researcher through review of the relevant literature. Data were collected from the control group firstly and after its completion, data were collected from the study group to prevent the contamination effect between the studied groups that might affect the study results. **Content validity and applicability** were tested by 5 experts in the field of Medical - Surgical Nursing and Urology, then the necessary modifications were done accordingly. **The reliability** of the tools was estimated using the Cronbach's Alpha test to measure its internal consistency. It indicated that tools II, and III have a reliability  $r = 0.750$ , and  $0.829$ , respectively. **A pilot study** was conducted on 10 patients out of the sample to test the feasibility and applicability of the developed tools and necessary modifications were done.

### The study was conducted as follows:

**Phase I: Assessment phase:** Initial assessment of all patients (both study and control group) was carried out immediately before beginning of the implementation of the Bladder Training and Pelvic Floor Muscle Exercises program using tools I, II and III, to collect baseline patients' data, health history, assess existing knowledge and lifestyle behavior, as well as, assessing the patients' needs preceded the planning for developing the Bladder Training and Pelvic Floor Muscle Exercises program.

**Phase II: Planning and development phase:** Based on the assessment of patients' needs, the Bladder Training and Pelvic Floor Muscle Exercises program was formulated

based on reviewing relevant literature and the identified patients' needs. The content was organized according to a feasible learning sequence from easy to difficult to enhance patients' understanding.

**Phase III: Implementation phase:** The Bladder Training and Pelvic Floor Muscle Exercises program was implemented in the study group. The patients' interviews and follow-ups were carried out at the urology outpatient clinic of Etay Elbarood General Hospital. It was conducted in 2 sessions. The first session was carried out during the assessment phase during the patient preparatory visit. The second session was carried out during the implementation phase of overactive bladder patients' lifestyle modification, Each session took about 45-60 minutes through the following:-

\***The first session contents included the following:** Specification of the objectives and time of the program. Information about the disease (definition, signs & symptoms, causes & risk factors, its complications and methods of treatment). Knowledge related to bladder training and pelvic floor muscle exercises program such as (definition, benefits, cautions during exercises, duration of PFME).

\* **The second session included:** Lifestyle modifications:- Instructions regarding how to perform bladder training and PFME at home to control urgency and track compliance to the physical therapy intervention. The patient was subjected to pelvic floor muscle exercises during the visit, each session lasted 20-30 minutes (follow-up starting from second to six week).

**Phase IV: Evaluation phase:** Patients in the study group were evaluated by the researcher using tools I, II and II, after implementation of the bladder training and PFME program. Evaluation of the effect of bladder training and pelvic floor muscle exercises was done to evaluate its effectiveness on urge control for the study group. The evaluation was done on the sixth week for both the study and control group to evaluate their OAB symptoms and knowledge.

**Ethical considerations:**

Before the initial interview, the researcher introduced herself to patients who met the inclusion criteria and were fully informed about the purpose and nature of the study. A written informed patients' consent to participate in the study was obtained before data collection and after an explanation of the aim of the study. Anonymity, confidentiality and privacy were ascertained. The researcher emphasized that participation in the study is entirely voluntary and that withdrawal from the study at any time would not affect the care provided.

**Data processing and Statistical Analysis:**

The collected data were organized, tabulated and statically analyzed using the statistical package for social studies (SPSS) Version 25.0. Qualitative data were described using number and percent. Quantitative data were described mean  $\pm$  standard deviation. Finally analysis and interpretation of data were conducted. P-values of 0.05 or less were considered statistically significant.

**Results**

**Table 1** shows a comparison between the control and the study group according to their socio-demographic data. There were no statistically significant differences between the two groups about their socio-demographic data.

**Table 2 (a )** shows a comparison between the control and the study group according to clinical data related to disease and medical history. Concerning current symptoms this table shows that all studied patients in the control group had urgency with uncomfortable feeling, sudden and severe urge to urinate (100%, 100% respectively). Also, it can be noticed that the majority of those patients had urinary frequency, nocturia, sudden leakage of small amount of urine, uncontrolled strong urge to urinate and leakage of urine accompanied by strong urge to urinate (93.3%,93.3%,90%,90%,90% respectively). While, in the study group all studied patients had urgency with uncomfortable feeling, sudden and severe

urge to urinate and nocturia (100%, 100%, 100% respectively). Also the majority of them (86.7%) had urinary frequency.

**Table 4** shows a comparison between the control and the study group according to OAB symptoms assessment there was a highly statistically significant difference between the control and study group post intervention and in the study group pre and post intervention where  $p = (<0.001^*, <0.001^*$  respectively) .

**Table 5 (b)** shows a comparison between the control and the study group according to level of lifestyle. Concerning the overall level of lifestyle satisfaction, there was a highly statistically significant difference between the control and study group post intervention and in study group pre and post intervention where  $p = (<0.001^* , <0.001^*$  respectively).

**Table 10** shows a correlation between life style with overactive bladder patients' knowledge and overactive bladder symptoms assessment. There was a strong negative significant correlation between OAB patients' symptoms and fluid intake ,socialization ,rest and sleep ,mental and mood state and urination habits in the study group post intervention where  $p = (<0.001^*, <0.001^*, 0.001^*, <0.001^*$ , respectively)

**Discussion:**

The results of the present study revealed that the largest proportion of the studied patients in the control and study group were females and in the age group (30 <45) years. This finding was supported by (Al Edwan et al ., 2021) who discovered that, in the Middle Eastern setting, women aged 40 years or older had a high prevalence (53.8%) of OAB. Additionally, Yang et al. (2022) found that OAB is more common in middle-aged adults over 40 years and that its prevalence rises with age with more women (11–39.5%) experiencing this disorder than men (11–27%). On the other hand, the results of the present study was contradicted by Nagai et al. (2022) who found that there was a significant association of OAB with ages 45 to 54 years and postmenopausal status.

The finding of the present study showed that the largest proportion of the studied patients in two groups were housewives. These results were in the same line with (Zhu et al., 2019) who stated that there was a significant negative association between employment status and OAB. Also, (Eladyed et al., 2018) found that nearly two-thirds of studied OAB patients were housewives. While, this finding was contradicted by Chuang et al. (2019) who reported that there was no significant differences in OAB prevalence according to work status.

The present study illustrated that the majority of the studied patients in two groups were from rural. This finding was supported by Eladyed et al. (2018) who reported that over half of the studied women were from rural regions, added that increasing the level of education can improve management of OAB syndrome and help women to seek medical advice and treatment. While, this study finding was contradicted by Przydacz et al. (2020b) who stated that more OAB participants were residing in urban than in rural regions and the prevalence of OAB did not differ in urban and rural regions.

Additionally, the results of the present study clarified that the largest proportion of the studied patients in two groups were married. This finding was supported by Alshehri et al. (2022) who found that there was a significant difference in the grades of urinary incontinence based on the marital status of the participants, with the highest prevalence of severe urinary incontinence among those who were married. However, this finding was contradicted by Zhu et al. (2019) who mentioned that there was no significant association between marital status and OAB, and suggested that marital status are not a risk factor for OAB.

As regards, current symptoms:- The present study finding revealed that all studied patients in two groups had urgency with uncomfortable feeling, sudden and severe urge to urinate. In addition, nocturia in all patients in the study group was the most

bothersome symptoms. Furthermore, urinary frequency, sudden leakage of small amount of urine, uncontrolled strong urge to urinate and leakage of urine accompanied by strong urge to urinate.

This finding was supported by Santander et al. (2022) who stated that the most bothersome symptom associated with a moderate to severe impact on quality of life was urinary urgency. Also, Versi et al. (2022) suggested that urgency rather than total voiding frequency had negative impact on patients' lives. Also, this result was in the same line with Qudah et al. (2024) who found that nocturia was the most common symptom among all OAB patients, followed by urgency. In addition, Al Edwan et al. (2021) who discovered that the highest percentage of studied OAB patients had symptoms of urinary incontinence.

The finding of the present study illustrated that two-thirds of studied patients in the study group had severe symptoms pre intervention. While, post implementation of educational program and lifestyle modifications their symptoms and their quality of life (QOL) were improved and more than two-thirds of studied patients had no symptoms. This finding was supported by Wang and Xu (2018) who stated that educational programs as; developing healthy toileting habits, improving bladder symptoms, or enhancing OAB-specific or general health-related QOL showed significantly relieved the OAB symptoms and decreased the likelihood of being wet and the intensity of urgency. So, OAB specific QOL was improved significantly. Additionally, the finding of the present study revealed that there was a highly statistically significant difference between the control and study group post intervention and in the study group pre and post intervention respectively.

Concerning, the overall level of lifestyle satisfaction. The present study finding showed that all studied patients in both control and study group had unsatisfactory levels pre intervention for the study group

and pre receiving hospital routine care for the control group.

The present study finding showed that in the control group pre receiving hospital routine care there was a negative correlation between overactive bladder patients' symptoms and socialization, rest and sleep ,mental and mood state, urination habits and overall lifestyle. This study finding was supported by (Xu,et al.,2018) who reported that patients with bothersome OAB tended to have lower levels of QOL, and that OAB symptom severity was directly linked to lower QOL. Additionally, bother increased with OAB symptom severity.

Regarding study group patients pre intervention it can be noticed that there was a positive significant correlation between overactive bladder patients' knowledge and exercises, defecation habits, socialization ,urination habits ,bladder training and overall lifestyle. While, post intervention there was a positive significant correlation between overactive bladder patients' knowledge and bladder diary, pelvic floor muscle exercises and overall lifestyle .

In the study group pre intervention it can be noticed that there was a strong negative correlation between overactive bladder patients' symptoms and rest and sleep ,mental and mood state, urination habits and overall lifestyle. While, post intervention the finding of the present study revealed that there was a strong negative significant correlation between overactive bladder patients' symptoms and fluid intake ,socialization ,rest and sleep ,mental and mood state and urination habits .

### **Conclusion:**

Based on the findings of the present study, it can be concluded that: The majority of the studied patients had no OAB symptoms post intervention and there was a highly statistically significant difference in OAB symptoms assessment between the control and study group post- intervention and in the study group pre and post- intervention .All patients in study group had satisfactory level

related to lifestyle post- intervention and there was a highly statistically significant difference between the control and study group post intervention and in the study group pre and post intervention. There was a positive significant correlation between overactive bladder patients' knowledge and bladder diary, pelvic floor muscle exercises and overall lifestyle in the study group post intervention. There was a strong negative significant correlation between OAB patients' symptoms and fluid intake ,socialization ,rest and sleep ,mental and mood state and urination habits in the study group post intervention.

### **Recommendations:**

Based on the findings of the present study, the following items are recommended:

#### **For health care providers:**

Development of an in- service training program for nurses and other health care providers to be able to teach OAB patients bladder training and pelvic floor muscles exercises.

**For health organization:** Development of health education programs for patients with OAB that use individualized educational materials to facilitate self-management and to teach newly diagnosed patients how to apply healthy lifestyles related to OAB and avoid unhealthy life styles, Develop simple educational booklets containing relevant information and simple figures about bladder training and pelvic floor muscles exercises and should be available in outpatient clinics of urology and gynecology ,Increase awareness of patients through mass media to help them to seek care at the onset of symptoms and incorporation of OAB knowledge in curricular education, Provide each urologic clinic with qualified nurses to give information for overactive bladder patients about behavioral therapy and lifestyle modifications,

**For further studies:** Replication of the study on large proportional sampling to attain more generalized results.



**Table (1) Comparison between the control and the study group according to socio-demographic data. (n=60)**

	Control (n = 30)		Study (n = 30)	
	No.	%	No.	%
<b>Age in years</b>				
18 < 30	7	23.3	10	33.3
30 <45 years	14	46.7	16	53.3
45 ≤60 years	9	30.0	4	13.3
<b>Sex</b>				
Male	3	10.0	6	20.0
Female	27	90.0	24	80.0
<b>Employment status</b>				
Manual work	2	6.8	4	13.3
Professional	1	3.3	3	10.0
House wife	25	83.3	19	63.4
Pensioner	1	3.3	0	0.0
Doesn't work	1	3.3	4	13.3
<b>Area of residence</b>				
Rural	29	96.7	27	90.0
Urban	1	3.3	3	10.0
<b>Level of education</b>				
Read and write	3	10.0	3	10.0
Primary	7	23.3	1	3.3
Preparatory	10	33.3	8	26.7
Secondary	5	16.7	10	33.3
University	5	16.7	8	26.7
<b>Marital status</b>				
Single	2	6.7	8	26.7
Married	27	90.0	20	66.7
Widower	1	3.3	2	6.7

**Table (2a): Comparison between the control and the study group according to clinical data related to disease and medical history. (n=60)**

Clinical data: data related to disease and medical history	Control (n = 30)		Study (n = 30)	
	No.	%	No.	%
<b>What are your current symptoms? #</b>				
Urinary frequency more than 8 times /24 hours	28	93.3	26	86.7
Nocturia more than 2 times	28	93.3	30	100.0
Urgency with uncomfortable feeling	30	100.0	30	100.0
Sudden and sever urge to urinate	30	100.0	30	100.0
Sudden leakage of small amounts of urine	27	90.0	24	80.0
Un controlled strong urge to urinate	27	90.0	24	80.0
Leakage of urine accompanied by a strong urge to urinate	27	90.0	24	80.0
<b>When you began to complain of these symptoms?</b>				
1 month <1 year	21	70.0	21	70.0
1 year < 5 years	6	20.0	4	13.3
5 years <1 0years	3	10.0	5	16.7
<b>When did you go to see a doctor for the first time?</b>				
At the onset of symptoms	3	10.0	7	23.3
when symptoms worsened	21	70.0	19	63.4
When I became unbearable	6	20.0	4	13.3
<b>What is the current treatment type?</b>				
Medical (solifenacin 5mg)	7	23.4	12	40.0
Medical (mirabegron 25 mg)	21	70.0	15	50.0
Medical (andodarin 7.5 mg)	1	3.3	3	10.0
Medical (solifenacin and mirabegron)	1	3.3	0	.0
<b>Do you suffer from any other health problems?</b>				
Yes	<b>30</b>	<b>100.0</b>	<b>28</b>	<b>93.3</b>
No	0	0.0	2	6.7
<b>If yes, please state the main reason? #</b>	<b>(n = 30)</b>		<b>(n = 28)</b>	
Respiratory disorders	3	10.0	4	14.3
Cardiovascular disorders	2	6.7	4	14.3
Renal disorders	28	93.3	26	92.9
Reproductive disorders	1	3.3	4	14.3
Endocrine disorders	6	20.0	3	10.7
Gastro intestinal disorders	2	6.7	3	10.7
Musculoskeletal disorders	0	0.0	1	3.6
<b>Have you ever been hospitalized due to any diseases?</b>				
Yes	<b>7</b>	<b>23.3</b>	<b>5</b>	<b>16.7</b>
No	23	76.7	25	83.3
Respiratory disorders	1	3.3	3	10.0
Cardiovascular disorders	3	10.0	1	3.3
Renal disorders	0	0.0	1	3.3
Reproductive disorders	1	3.3	0	3.3
Endocrine disorders	1	3.3	0	6.7
Gastro intestinal disorders	1	3.3	0	10.0
Endocrine disorders	0	0.0	0	10.0
Musculoskeletal disorders	0	0.0	0	6.7

$\chi^2$ : Chi square test

MC: Monte Carlo

FE: Fisher Exact

p: p value for comparing between the studied groups

**Table (4): Comparison between the control and the study group according to overactive bladder symptoms assessment (n=60).**

Overactive Bladder Symptoms Assessment	Control (n = 30)				Study (n = 30)				Test of sig. (p <sub>1</sub> )	Test of sig. (p <sub>2</sub> )
	Pre		Post		Pre		Post			
	No.	%	No.	%	No.	%	No.	%		
No symptoms	0	0.0	0	0.0	0	0.0	20	66.7	$\chi^2=1.135$ ( <sup>MC</sup> p=0.841)	$\chi^2=48.271^*$ ( <sup>MC</sup> p<0.001 <sup>*</sup> )
Mild symptoms	1	3.3	2	6.7	2	6.7	7	23.3		
Moderate symptoms	8	26.7	10	33.3	8	26.6	2	6.7		
Severe symptoms	17	56.7	15	50.0	18	60.0	1	3.3		
Most symptoms	4	13.3	3	10.0	2	6.7	0	0.0		
<b>MH<sub>p0</sub></b>	<b>0.251</b>				<b>&lt;0.001<sup>*</sup></b>					
<b>Total score</b>									U=407.0 (0.523)	U=34.0 <sup>*</sup> (<0.001 <sup>*</sup> )
Min. – Max.	9.0 – 23.0		7.0 – 20.0		9.0 – 20.0		1.0 – 17.0			
Mean ± SD.	16.0 ± 3.37		14.73 ± 3.71		15.40 ± 3.18		4.40 ± 3.63			
Median	16.0		15.50		16.0		3.50			
<b>Score</b>										
Min. – Max.	36.0 – 92.0		28.0 – 80.0		36.0 – 80.0		4.0 – 68.0			
Mean ± SD.	64.0 ± 13.49		58.93 ± 14.85		61.60 ± 12.72		17.60 ± 14.50			
Median	64.0		62.0		64.0		14.0			
<b>Z(p<sub>0</sub>)</b>	<b>1.692 (0.091)</b>				<b>4.790<sup>*</sup>(&lt;0.001<sup>*</sup>)</b>					

$\chi^2$ : Chi square test

FE: Fisher Exact

MH: Marginal Homogeneity Test

U: Mann Whitney test

Z: Wilcoxon signed ranks test

p: p value for comparing between the studied groups

p<sub>0</sub>: p value for comparing between **pre** and **post**

\*: Statistically significant at p ≤ 0.05

**Table (5b): Comparison between the control and the study group according to level of life style (n=60).**

	Control (n = 30)				Study(n = 30)				$\chi^2$ (p <sub>1</sub> )	$\chi^2$ (p <sub>2</sub> )
	Pre		Post		Pre		Post			
	No.		No.		No.		No.			
<b>Personal Hygiene</b>	(n = 27)				(n = 24)					
Unsatisfactory (<50)	23	85.2	22	81.5	19	79.2	10	41.7	0.317 ( <sup>FE</sup> p=0.718)	8.617* (0.003*)
Satisfactory (≥50)	4	14.8	5	18.5	5	20.8	14	58.3		
<sup>MCN</sup> p <sub>0</sub>	1.000				0.035*					
<b>Urination Habits</b>										
Unsatisfactory (<50)	29	96.7	25	83.3	27	90.0	1	3.3	1.071 ( <sup>FE</sup> p=0.612)	39.095* (<0.001*)
Satisfactory (≥50)	1	3.3	5	16.7	3	10.0	29	96.7		
<sup>MCN</sup> p <sub>0</sub>	0.219				<0.001*					
<b>Double Voiding</b>										
Unsatisfactory (<50)	27	90.0	27	90.0	30	100.0	1	3.3	3.158 ( <sup>FE</sup> p=0.237)	45.268* (<0.001*)
Satisfactory (≥50)	3	10.0	3	10.0	0	0.0	29	96.7		
<sup>MCN</sup> p <sub>0</sub>	1.000				<0.001*					
<b>Bladder Diary</b>										
Unsatisfactory (<50)	30	100.0	30	100.0	29	96.7	7	23.3	1.017 ( <sup>FE</sup> p=1.000)	37.297* (<0.001*)
Satisfactory (≥50)	0	0.0	0	0.0	1	3.3	23	76.7		
<sup>MCN</sup> p <sub>0</sub>	-				<0.001*					
<b>Pelvic Floor Muscle Exercises</b>										
Unsatisfactory (<50)	30	100.0	30	100.0	30	100.0	1	3.3	-	56.129* (<0.001*)
Satisfactory (≥50)	0	0.0	0	0.0	0	0.0	29	96.7		
<sup>MCN</sup> p <sub>0</sub>	-				<0.001*					
<b>Bladder training (Urge suppression Techniques)</b>										
Unsatisfactory (<50)	30	100.0	30	100.0	30	100.0	2	6.7	-	52.50* (<0.001*)
Satisfactory (≥50)	0	0.0	0	0.0	0	0.0	28	93.3		
<sup>MCN</sup> p <sub>0</sub>	-				<0.001*					
<b>Overall</b>										
Unsatisfactory (<50)	30	100.0	27	90.0	30	100.0	0	0.0	-	49.091* (<0.001*)
Satisfactory (≥50)	0	0.0	3	10.0	0	0.0	30	100.0		
<sup>MCN</sup> p <sub>0</sub>	0.250				<0.001*					

$\chi^2$ : Chi square test

FE: Fisher Exact

McN: McNemar test

p<sub>0</sub>: p value for comparing between pre and post

p<sub>1</sub>: p value for comparing between the studied groups in pre

p<sub>2</sub>: p value for comparing between the studied groups in post

\*: Statistically significant at p ≤ 0.05

**Table (10): Correlation between life style with overactive bladder patients' knowledge and overactive bladder symptoms assessment (n=60).**

Life style		Control (n = 30)				Study (n = 30)			
		Overactive Bladder Patients' Knowledge		Overactive Bladder Symptoms Assessment		Overactive Bladder Patients' Knowledge		Overactive Bladder Symptoms Assessment	
		Pre	Post	Pre	Post	Pre	Post	Pre	Post
Diet	r	0.198	0.110	0.060	-0.163	0.005	0.316	0.049	0.112
	p	0.295	0.563	0.753	0.389	0.981	0.089	0.798	0.555
Fluid Intake	r	0.045	0.046	-0.284	-0.419*	0.033	0.101	0.003	-0.718*
	p	0.813	0.810	0.128	0.021*	0.861	0.597	0.988	<0.001*
Exercise	r	0.120	0.281	0.471	0.226	0.999*	0.084	-0.126	0.681
	p	0.822	0.590	0.346	0.666	<0.001*	0.894	0.840	0.205
Smoking	r	-	-	0.999*	0.999*	-	-	-	-
	p	-	-	<0.001*	<0.001*	-	-	-	-
Defecation Habits	r	0.063	0.177	-0.147	-0.235	0.472*	0.095	0.024	0.116
	p	0.742	0.348	0.437	0.211	0.008*	0.618	0.900	0.541
Medications	r	0.067	0.107	-0.059	0.212	0.153	0.149	0.057	0.251
	p	0.725	0.575	0.756	0.260	0.419	0.432	0.764	0.181
Socialization	r	0.037	0.098	-0.380*	-0.185	0.552*	0.087	-0.118	-0.644*
	p	0.848	0.605	0.038*	0.328	0.002*	0.646	0.536	<0.001*
Rest and Sleep	r	0.008	0.002	-0.398*	-0.297	0.164	0.035	-0.363*	-0.670*
	p	0.965	0.993	0.029*	0.111	0.387	0.853	0.049*	<0.001*
Mental and Mood State	r	0.137	0.221	-0.602*	-0.288	0.119	0.009	-0.734*	-0.586*
	p	0.471	0.240	<0.001*	0.123	0.530	0.963	<0.001*	0.001*
Personal Hygiene	r	0.631*	0.180	0.304	-0.141	0.128	0.154	0.207	0.380
	p	<0.001*	0.368	0.123	0.481	0.552	0.472	0.332	0.067
Urination Habits	r	0.190	0.238	-0.395*	-0.503*	0.380*	0.117	-0.656*	-0.926*
	p	0.314	0.204	0.031*	0.005*	0.039*	0.538	<0.001*	<0.001*
Double Voiding	r	0.311	0.065	0.215	-0.285	-	0.320	-	-0.001
	P	0.095	0.731	0.254	0.127	-	0.085	-	0.994
Bladder Diary	r	-	-	-	-	0.021	0.544*	0.036	0.120
	p	-	-	-	-	0.914	0.002*	0.852	0.527
Pelvic Floor Muscle Exercises	r	0.141	0.090	-0.088	-0.444*	0.313	0.363*	-0.353	0.127
	p	0.458	0.636	0.645	0.014*	0.092	0.049*	0.056	0.502
Bladder training (Urge suppression Techniques)	r	0.114	0.161	-0.204	-0.529*	0.482*	0.360	-0.238	-0.213
	p	0.550	0.395	0.280	0.003*	0.007*	0.051	0.206	0.258
Overall	r	0.153	0.075	-0.391*	-0.213	0.377*	0.429*	-0.363*	-0.314
	p	0.418	0.694	0.033*	0.258	0.040*	0.018*	0.048*	0.091

r: Pearson coefficient

\*: Statistically significant at  $p \leq 0.05$

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