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## Effect of Pelvic Floor muscle Training Program on Quality of Life among Women with Stress Urinary Incontinence

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### ABSTRACT

**Background:** The most prevalent kind of urine incontinence in word wide, stress urinary incontinence that has an impact on women quality of life at various phases of their lives. According several previous studies, pelvic floor muscle training program is the best way for rehabilitating and strengthening pelvic floor muscles. **Aim:** To evaluate the effect of pelvic floor muscle training program on quality of life among women with stress urinary incontinence. **Subjects and method: Design:** A quasi-experimental design was utilized (one group). **Subjects:** 110 women who have been diagnosed with stress urine incontinence. **Setting:** This study was applied in gynecologic outpatient clinics at hospitals and primary health care centers that follow comprehensive health insurance. **Tools for data collection:** A structured interview, woman's health assessment questionnaire, The Incontinence Impact Questionnaire-Short Form (IIQ) -7, and Follow up assessment sheet. **Results:** Training program was effective in reducing the severity of urine incontinence in the post- and follow-up periods (5.5% and 6.4%). Mean scores of quality of life were improved at post and follow up phase ( $18.7\pm 0.3$ ,  $18.0\pm 3.1$  respectively) after providing training program compared to preprogram phase ( $8.01\pm 2.9$ ) with highly statistically significant difference ( $p= .000$ ). Also, mean score of women knowledge were improved at post and follow up phase ( $12.2\pm 1.2$  and  $11.3 \pm 1.8$ , respectively). **Conclusion:** Pelvic floor muscle training program was effective in improving women's quality of life and reduced stress urinary incontinence. **Recommendations:** Making available manual for ongoing education and training about pelvic floor muscle exercises for all women with stress urinary incontinence.

**Keywords:** Pelvic floor muscle training program, Quality of life, Stress urinary incontinence.

## **INTRODUCTION**

Stress urinary incontinence (SUI) is defined as an unintentional urine leak caused by increased pressure on the bladder caused by coughing, sneezing, laughing, or exercise like pulling up a heavy load or a full shopping bag. It develops as a result of the pelvic muscles and ligaments becoming weaker (Ricci, 2017).

Nearly 200 million people worldwide suffer from stress urinary incontinence (SUI), which is six times more prevalent in women than in males. Systematic investigation found a large prevalence range from 16.2% to potentially 81.9% due to population sample heterogeneity (Akinlusi et al., 2020).

Additionally, Hassan, Mohamed, and El-Nemer (2015) revealed that 54% of Egyptian women had experienced UI. Stress incontinence was also seen at a prevalence of 14.8%. The actual figure may be higher, though, as the majority of women do not want to ask for assistance. According to El- Azab and Shaaban (2010), women in Egyptian society commonly fail to disclose urine incontinence and are not routinely questioned about it when they see their healthcare professionals.

According to Lowdermilk, Perry, Cashion, Alden, and Olshansky (2016), structural injury to the bladder neck can lead to stress incontinence. Essa, Hafez, and Kandeel (2020) add that a number of factors, including ageing, childbirth, hormonal changes associated with menopause, obesity, gynecological surgery, genetics, the use of specific drugs, and smoking, as well as physical activities, can contribute to the development of stress urinary incontinence. Additionally, the chance of SUI rises with age, although it can also happen to young women who haven't given birth as well as after childbirth. The main risk factors for SUI are: genetic and sex characteristics, conditions that affect urine control (such as abdominal surgery or multiple births), obesity and overweight, drugs, and urological urinary tract infections.

One of the primary forms of conservative care, specifically pelvic floor muscle training (PFMT), an exercise regimen designed to strengthen PFM, was the subject of a systematic review by Varghese and Viswanath (2023). PFM strength training is advised as the mainstay of treatment for UI in women because it has been demonstrated to be effective. Phasic and tonic contractions are exercises used to strengthen PFM. While

forceful contractions stabilise the urethra, phased contractions support it right away (Joseph et al., 2021).

When it comes to treating urine incontinence, nurses are anticipated to be the most economical healthcare professionals. Urinary incontinence is actively promoted by nurses. This job entails the use of high-quality practices, education, training, and practise based on research. Additionally, nurses provide advice on how to preserve health, prevent problems, and aid in the return of normal functions to women (Abd El-Aty & Hassan, 2021). Therefore, the first line of treatment for women with SUI should be pelvic floor muscle training (PFMT).

### **Significance of the study**

Stress urinary incontinence is the most prevalent type of UI in women (Juráková et al., 2020). According to studies, the prevalence of stress incontinence ranges from 4% to 35% (Jasim & Khalil, 2020). According to Hassan et al. (2015), 14.8% of Egyptian women had SUI, while 50% of those who had urine incontinence complained of symptoms. Stress urinary incontinence, according to Townsend et al. (2017). Uncontrollable symptoms are common, have a big impact on how well people feel about their health, and are quite expensive for both individuals and society.

Stress urinary incontinence affects one's health, increases vulnerability to stress across age groups, and can have a negative impact on social interactions due to gender constraints. due to potential shame and apprehension about leaving home, social activities. Only a small number of research have examined how UI affects women's quality of life (QoL). As a result, they had to assess how a pelvic floor training program affected the women with stress urine incontinence's quality of life.

### **AIM OF THE STUDY**

Evaluate the effect of pelvic floor muscle training program on quality of life among women with stress urinary incontinence.

## **Specific Objectives**

The aim was achieved through the following:

1. Assessing women knowledge about stress urinary incontinence.
2. Assessing the characteristics and severity of stress urinary incontinence among women in Port Said city.
3. Assessing quality of life among women with stress urinary incontinence.
4. Developing and implementing educational and training program for controlling stress urinary incontinence among women.
5. Evaluating the effectiveness of pelvic floor muscle training program on improvement stress urinary incontinence and quality of life of women with stress urinary incontinence.

## **Hypothesis**

Programs for strengthening the pelvic floor muscles are positively affect reducing severity of stress incontinence and enhancing the quality of life for those who suffer from it.

## **SUBJECTS AND METHOD**

### **Technical design**

### **Research design**

A quasi-experimental one-group (pre-post-follow up) research design was used in this study.

### **Setting**

At the city of Port Said, the study was carried out at the outpatient gynaecological clinics of two public hospitals, Dar Sihat Almar'a Hospital & Al-Hayaa Port Fouad hospital, covering various regions and associated with a comprehensive health insurance programme. Additionally, research was done at the gynaecological outpatient clinic of primary care centres, notably the following ones: El-Arab, Aleilaj Altabieiu, El Taawnyat

centre, El Gawhara centre, Blal centre, and Muhamad Meshaly centre. This study covers a wide range of topics and involves a comprehensive health plan.

### Study Sample

Purposive sample was utilized in this study for all women's diagnosed with stress urinary incontinence in previously mentioned setting.

### Inclusion criteria

1. Women aged 20 -55 years and not pregnant
2. Have stress urinary incontinence
3. Free from diabetics, and renal disease
4. Women with no previous or current urinary incontinence treatment

### Sample Size

i. The sample size was determined by using the following equation (Dobson , A. J., 2002):

$$\text{Sample size (n)} = (z / \Delta)^2 p (100 - p).$$

#### Where:

**P:** The prevalence of stress urinary incontinence 35% according to (Jasim & Khalil., 2020).

**Z $\alpha$ /2:** a percentile of standard normal distribution determined by confidence level = 1.96

**$\Delta$ :** The width of confidence interval = 10%.

$$\text{Sample Size (n)} = (1.96/10)^2 35x (100-35) \geq 100.$$

**The calculated Sample size is 110 women with stress urinary incontinence.**

### Tools of data collection

Four tools were utilized for data collection:

**Tool (I): A structured interview:** It was adapted from El-Badawy, Hassan, Abo El-Souud, and Abd Allah (2013) in English language and modified by researcher to assess women's knowledge about stress urine incontinence. It was included three sections:

**Section 1:** It was covered the following data Socio-demographic characteristics which included name, age, education, marital condition, occupation, residence, income and telephone number.

**Section 2:** Medical and surgical history, family history, obstetrical history such as gravidity, parity, delivery mode in last pregnancy.

**Section 3:** It covers questions regarding issues with urine incontinence, such as (definition, types, causes, etc.).

**Scoring system:** For each knowledge item, the right answer received a score of 1, while the wrong answer received a score of 0. When the percentage score reached 60% or higher, knowledge was accepted as satisfactory; when it fell below, it was accepted as unsatisfactory.

**Tool (II): Woman's health assessment questionnaire:** It was developed by Hassan et al. (2015) in English language to evaluate the characteristics and severity condition of women with stress incontinence. It is divided into four sections:

**Section 1:** It is concerned with data regarding characteristics of UI such as frequency, duration, and Body Mass Index (BMI).

**Section 2:** The primary outcome of the current investigation was the Sandvik urine incontinence severity index (ISI). In order to determine the Sandvik ISI, leaks are multiplied by the reported UI frequency (less than once per month, 1-3 times per month, once per week, once per day). The amount of leakage is given a value of 1 for a single drop or 2 for numerous drips, and the frequency of the UI is given a value ranging from 1 to 4, with a larger number signifying a higher frequency, and amount of leakage is assigned a value of 1 for one drop or 2 for more than a drop.

**Section 3:** Vaginal digital test: This test asks the lady to squeeze around the examiner's finger while wearing a glove and lubricant to determine how well she can contract her muscles. The following scale is used to determine the PFM tone:

No contraction is represented by 0, a poor contraction is represented by 1, a good contraction is represented by 2, and a strong contraction is represented by 3 (stronger pressure than 5 seconds).

**Section 4:** Provocation test: This examination measures the amount of leakage that a woman produces while coughing five times. Leakage is assessed using the scale below: No leak is indicated by a score of 0, a slight leak (few urine drops) is shown by a score of 1, a moderate leak is indicated by a score of 2, and a severe leak is indicated by a score of 3.

**Tool (III): The Incontinence Impact Questionnaire-Short Form (IIQ) -7:** It was developed in 1995 by Uebersax et al. Hassan et al. (2015) in English language to assess how SUI affects health-related quality of life (QOL). To further understand how urine leakage affects physical activity, home tasks, social interaction, leisure, travel, emotional health, and frustration, seven items were added to the questionnaire.

**Scoring system:** Response options were “greatly”, “moderately”, “slightly” or “not at all”. Responses were assigned values of 0 for “not at all”, 1 for “slightly”, 2 for “moderately” and 3 for “greatly”. The higher the total score of the IIQ-7, the greater the negative impact on health-related QOL. The average score of answered items is calculated. The average is multiplied by 33 1/3 to convert scores on a scale from 0 to 100. Score 0 means no problems. Urinary Incontinence Impact Indicator (UIII) in the range of 1-25 means a slight disturbance, 26-50 moderate, 51-75 substantial and 75-100 severe disturbances.

**Tool IV: Follow up assessment sheet:** It was developed by the researcher to measure the output and outcome of the program as:

- Using a seven-day exercise diary that the woman completed, and an evaluation of compliance based on the number of days per week that the woman adhered to home recommendations, pelvic floor muscle training (PFMT) compliance was determined. When executing the program, study.
- Reassessing user interface characteristics using Tool I Part 2 and completing a physical examination using Tool I at the program's conclusion serve as indicators of user interface progress.
- The Quality of Life Assessment (Tool II) was used to measure changes in quality of life twice after 3 and 6 months from the program.

## **Administrative Design**

An official letter from the Dean of the Faculty of Nursing at the University of Port Said was sent to the responsible authorities, after explaining his intentions, to ask for their permission to conduct the research.

## **Operational Design**

This operational design included preparatory phase, content validity, Pilot study, and Fieldwork.

### **1. Preparatory phase**

Researchers reviewed the goals at this stage, and data gathering tools are developed. To learn more about the study topic, reviewing the nursing books, articles, the internet, and journals in addition to regularly revised national and worldwide literature, numerous studies, and theoretical knowledge on different facets of the topic.

### **2. Content Validity of the study tools:**

The tools were developed and approved by seven obstetrics and gynecology nursing staff experts.

### **3. Reliability of the study tools:**

On the research tool, an Alpha Cronbach reliability analysis was done. The Cronbach's Alpha coefficient test revealed acceptable internal consistency of  $r = .721$  for women knowledge about stress urinary incontinence,  $r = .932$  for characteristics of urinary incontinence,  $r = .934$  for incontinence severity index and  $r = .916$  for quality of life of women.

### **4. Pilot study**

Before the actual data collecting started, a pilot study was carried out after the questionnaire had been reviewed and approved by experts. The goal of the pilot study is to identify potential challenges and issues with the data gathering procedure as well as to confirm the accuracy and applicability of the research tools. This aids in estimating how long it will take to finish the questionnaire. On the basis of the pilot study's findings,



several questions were altered, explained, left out, or reorganized. To guarantee the consistency of the results, it was administered to 11 women from the Women's Health House Hospital in Port Said who were not part of the study's total sample. There have been internal, external, and conclusive impacts.

### **Fieldwork**

The framework mentioned before was used to collect data over the course of four months, from mid-December 2021 to mid-April 2022. Three days a week, from 9 am to 1 pm, the researchers attended one of the Pre-determined health facilities.

### **Assessment phase**

Using previously developed tools, data and needs assessments are gathered from women diagnosed with SUI from previous mentioned setting during this phase. In order to assess women's knowledge of stress incontinence, assess the characteristics and severity of SUI (onset, frequency, duration, amount of leakage), assess body mass index (BMI), determine knowledge base, and develop a health education intervention program, data were collected at this stage.

### **Planning phase**

After the evaluation process is complete, the researcher decides on the program's goals and arranged the materials for the subjects according to the necessary priority and the number of sessions. The researcher outlines the essential instructional techniques (examples of real-world situations, demonstrations and practice of Kegel exercises, brainstorming, presentations and conversations to exchange ideas). The investigator additionally identifies the required materials (her own photographs and guides).

### **Implementing phase**

The researcher starts running program sessions after completing the planning stage. All of the study participants were directed to the goals of the investigation. The outpatient clinic welcomed the researchers three days a week from 9 a.m. to 1 p.m. For women, a three-times-per-week Kegel exercise education training program is offered. Ten ladies per day were scheduled for program sessions. An introduction to the program,

a welcome, and definitions of terms relating to urine incontinence, risk factors, and kinds of urinary incontinence were all covered in the first session.

The second session addresses the advantages of a pelvic floor program, describes the Kegel procedure, and responds to queries from women. The goal of the pelvic floor muscle training program is to help women strengthen their pelvic floor muscles and safeguard their intestines and bladder. Additionally, Kegel's exercises enhance sexual performance and stop pelvic organ prolapse. In the pelvic floor muscle training program's exercise phase, women were instructed to recognize and feel the contractions of their pelvic floor muscles both while they are sitting and standing. For 3 to 5 seconds, tighten the muscles in your pelvic floor. The cycle of contraction and relaxation should be repeated ten times. Increase the duration of contraction and relaxation gradually. Work her way up to 10-second contractions and relaxations. Instruct women to try to do at least 30 Pelvic floor muscle training program every day by spreading them throughout the day.

The third session includes a repetition of the exercise to ensure that they understand how to perform it properly along with prepared educational materials to take home in a review of the material in Arabic, talking about lifestyle education health and diet management (like lowering body weight, avoiding prolonged standing, avoiding heavy lifting, eating vitamin-rich foods like non-acidic fruits and vegetables, and drinking excessive amounts of water in the morning) morning and afternoon instead of evening).

About two hours are spent in each session. A program to train the muscles in the pelvic floor is used for 11 weeks in a row. Weekly phone call are used to monitor and follow up on the all women training program, and a monthly meeting with the participating women is held to monitor and update data.

### **Evaluation phase**

Based on an evaluation of the women's growth in knowledge and practice, the program's efficacy was determined. A post-knowledge exam was given to evaluate the women's understanding of urine incontinence immediately following the training program's conclusion and three months after program implementation.

In order to evaluate the characteristics, severity of SUI and quality of life, post-test and practice follow-up using follow up assessment sheet were also carried out after 3

and 6 months from program implementation for 45 minutes to each woman in the previous mentioned setting. Wellbeing and standard of living of women who have this syndrome stress incontinence of the urine.

### **Ethical considerations**

The Faculty of Nursing at the University of Port Said's Research Ethics Committee granted approval {code number NUR (6, 8, 2023) (28)}. Additionally, each participant (women with stress urinary incontinence) and her family gave their informed consent after being explained the purpose of the study and the methods used to gather the data. Additionally, the investigator makes sure that the data is kept private and should only be applied to the research. The study's secrecy was guaranteed, and the researcher emphasized that each woman's involvement was voluntary and that she had the opportunity to leave the study at any time without explanation.

### **Limitation of the study**

At the follow up phase, 11 women didn't complete their participation in the study because they did not want to complete the training program.

### **Statistical Analysis**

A quantity and percentage distribution is used to sort, examine, store, tabulate, and analyze the collected data. The statistical tool for social sciences SPSS 16 was used for data entry and analysis. At the coding and data entering stages, quality check was carried out. The reliability of the items used for the established scales was assessed using a reliability study using the Cronbach's Alpha test. If it exceeds 0.7, reliability is considered to be good.

## **RESULTS**

**Table (1):** shows that less than half of studied women (43.6%) were aged between 31 – 40 years old with mean  $34.9 \pm 8.2$ . Regarding educational level, more than two fifths of the studied women had secondary education (44.5%). Half of the studied women had mild working (50.9%). Concerning to smoking, three fifths (60.9%) of the studie

**Table (2):** reveals the knowledge of the studied women about urinary incontinence throughout the program phases, it is revealed that statistically significant improvement was revealed at both the post and follow-up phases in all area of tested knowledge ( $p=0.000$ ) except environmental factors that impede quick access to the toilet are among the causes of urinary incontinence .

Concerning total knowledge of women about stress urinary incontinence at all program phases. It revealed that mean score of women's knowledge improved at post and follow up phase. Although, follow up phase demonstrated some decline but still were statistically significant higher than the pre-program levels ( $p=0.000$ ).

**Table (3):** illustrates that more than half of the studied women (50.0%) reported sever urinary leakage due to physical activity, coughing or sneezing pre intervention, while changed to be the minority of them post-immediate and follow up of providing the training program. Also, the same table clarified less than three quarters of the studied women (38.2%) had sever urinary leakage related to the feeling of urgency preprogram then decline to the minority of them (6.4%) after 3 months and after 6 months.

**Table (4):** shows that there was a highly statistically significant improvement in the studied women weight, height and body mass index at post and follow up phase of providing training program compared to pre- applying training program. Also, the same table shows that mean scores of body mass index were improved at post program compared to preprogram phase ( $30.1\pm 6.1$ ,  $30.8\pm 6.7$  respectively).

**Figure (1):** illustrates percentage distribution of the studied women according to the severity of incontinence throughout the program phases ( $n=110$ ). The figure shows that the severity of incontinence improved at post and follow up phase after providing training program compared to preprogram phase.

**Table (5):** illustrated that there was a highly statistically significant difference regarding items of vaginal digital test and provocation test at post and follow up training ( $<0.001$ ). As the table shows that, the mean scores of vaginal digital test and provocation test were improved at post and follow up phase ( $0.7\pm 0.8$ ,  $0.8\pm 0.8$  respectively) after providing training program compared to preprogram phase ( $1.8\pm 0.8$ ).

**Table (6):** found that mean scores of quality of life were improved at post and follow up phase ( $18.7\pm 0.3$ ,  $18.0\pm 3.1$  respectively) after providing training program compared to preprogram phase ( $8.01\pm 2.9$ ) with highly statistically significant difference ( $p= .000$ ).

**Table 7:** clarifies that more than one quarter (25.5%) of the studied women had score five of interference of urine leakage with their life in pre-program phase, while 25.5% and 26.4% of them had score two in post-program and follow up phases respectively. Also, it was found that mean scores of interference of urine leakage with the life were decreased at post and follow up phase ( $2.4\pm 1.6$ ,  $2.5\pm 1.6$  respectively) after providing training program compared to preprogram phase ( $6.1\pm 1.9$ ).

**Table 1: Percentage distribution of the studied women according to their general characteristics (n= 110).**

General characteristics	Women (110)	
	No.	%
<b>Age in Years</b>		
20 - 29	28	25.5
30 - 39	48	43.6
40 - 49	27	24.5
≥ 50	7	6.4
±SD	34.9±8.2	
Min- max	20 - 52	
Range	32	
<b>Marital Status</b>		
Single	14	12.7
Married	67	60.9
Divorced	8	7.3
Widowed	21	19.1
<b>Level of education</b>		
Illiterate	15	13.6
Basic education	8	7.3
Secondary education	49	44.5
University education	27	24.5
Post graduate	11	10.0
<b>Occupation</b>		
House wife	33	30.0
Mild working	56	50.9
Heavy working	21	19.1
<b>Smoking</b>		
Never smoking	76	60.9
passive smoking	43	39.1

**Table 2: Percentage distribution of the studied women according to their knowledge about stress urinary incontinence throughout the program phases (n= 110).**

Knowledge of women about stress urinary incontinence	Pre program				Post program (After 3 months)				Follow-up (After 6 months)				Test of significance (X2)	
	True		False		True		False		True		False		P1	P2
	n	%	n	%	n	%	n	%	n	%	n	%		
1.Urinary incontinence is unwanted and involuntary leakage of urine	68	61.8	42	38.2	105	95.5	5	4.5	80	72.7	30	27.3	x <sup>2</sup> = 3.23 p =.072	x <sup>2</sup> =13.8 p =.000
2.Urinary tract disease causes urinary incontinence	25	22.7	85	77.3	103	93.6	7	6.4	95	86.4	15	13.6	x <sup>2</sup> =10.09 p =.001	x <sup>2</sup> =59.1 p =.000
3.Frequent of pregnancy and childbirth are risk factors for urinary incontinence	8	7.3	102	92.7	107	97.3	3	2.7	106	96.4	4	3.6	x <sup>2</sup> =16.13 p =.000	x <sup>2</sup> =52.9 p =.000
4.Environmental factors that impede quick access to the toilet are among the causes of urinary incontinence	10	9.1	100	90.9	110	100.0	0	0.0	110	100.0	0	0.0	-----	-----
5.Lack of movement causes urinary incontinence	15	13.6	95	86.4	103	93.6	7	6.4	95	86.4	15	13.6	x <sup>2</sup> =12.01 p =.001	x <sup>2</sup> =11.1 p =.000
6.Urinary incontinence is normal with age	6	5.5	104	94.5	108	98.2	2	1.8	104	94.5	6	5.5	x <sup>2</sup> =35.30 p =.000	x <sup>2</sup> =10.1 p =.000
7.No relationship to obesity and urinary incontinence	93	84.5	17	15.5	6	5.5	104	94.5	13	11.8	97	88.2	x <sup>2</sup> =22.37 p =.000	x <sup>2</sup> =80.6 p =.000
8.Urinary incontinence increase after menopause	4	3.6	106	96.4	97	88.2	13	11.8	97	88.2	13	11.8	x <sup>2</sup> =11.01 p =.000	x <sup>2</sup> =10.1 p =.000
9.Urinary incontinence is treated with medication	80	72.7	30	27.3	11	10.0	99	90.0	24	21.8	86	78.2	x <sup>2</sup> =32.59 p =.000	x <sup>2</sup> =81.8 p =.000
10.There is no surgeries to treat incontinence	89	80.9	21	19.1	11	10.0	99	90.0	12	10.9	98	89.1	x <sup>2</sup> =51.79 p =.000	x <sup>2</sup> =57.1 p =.000
11.Urinary incontinence requires psychological treatment	39	35.5	71	64.5	88	80.0	23	10.0	82	74.5	28	25.5	x <sup>2</sup> =50.06 p =.000	x <sup>2</sup> =68.4 p =.000
12.Urinary incontinence is an occasional problem that goes away without intervention	88	80.0	22	20.0	6	5.5	104	94.5	15	13.6	95	86.4	x <sup>2</sup> =25.38 p =.000	x <sup>2</sup> =58.4 p =.000
13.Pelvic exercises help treat urinary incontinence	31	28.2	79	71.8	110	100.0	0	0.0	99	90.0	11	10.0	-----	x <sup>2</sup> =31.1 p =.000
<b>Total knowledge of women:</b> $\bar{X} \pm SD$ Min- max	5.05±1.4 2 - 9				12.2±1.2 7 - 13				11.3±1.8 7 - 13				x <sup>2</sup> =18.1 p =.000	x <sup>2</sup> =36.9 p =.000

chi square test statistically significant at P = < 0.05

P1 — Comparison between pre and post program

highly statistically significant at P = < 0.001—x2

P2 — Comparison between pre and follow-up program

**Table 3: Percentage distribution of women according to their characteristics of urinary incontinence throughout the program phases (n=110).**

Women characteristics of urinary incontinence	Pre program				Post program (after 3 months)				Follow-up (after 6 months)				Test of significance (X <sup>2</sup> )	
	None	Mild	Moderate	Severe	None	Mild	Moderate	Severe	None	Mild	Moderate	Severe	P1	P2
	n(%)	n(%)	n(%)	n(%)	n(%)	n(%)	n(%)	n(%)	n(%)	n(%)	n(%)	n(%)		
Frequent urination.	0(0.0)	28(25.5)	50(45.5)	32(29.1)	27(24.5)	57(51.8)	19(17.3)	7(6.4)	24(21.8)	52(47.3)	27(24.5)	7(6.4)	x <sup>2</sup> = 56.5 <0.001**	x <sup>2</sup> =44.4 <0.001**
Urine leakage related to the feeling of urgency.	0(0.0)	28(25.5)	40(36.4)	42(38.2)	19(17.3)	66(60.0)	18(16.4)	7(6.4)	16(14.5)	68(61.8)	19(17.3)	7(6.4)	x <sup>2</sup> =38.2 <0.001**	x <sup>2</sup> =28.8 <0.001**
Urine leakage due to physical activity, coughing or sneezing.	0(0.0)	9(8.2)	46(41.8)	55(50.0)	16(14.5)	60(54.5)	30(27.3)	4(3.6)	14(12.7)	61(55.5)	31(28.2)	4(3.6)	x <sup>2</sup> =48.5 <0.001**	x <sup>2</sup> =48.9 <0.001**
Small amount of urine leakage (drops).	2(1.8)	44(40.0)	42(38.2)	22(20.0)	39(35.5)	46(41.8)	21(19.1)	4(3.6)	33(30.0)	50(45.5)	23(20.9)	4(3.6)	x <sup>2</sup> =72.1 <0.001**	x <sup>2</sup> =66.1 <0.001**
Difficulty emptying the bladder.	59(53.6)	34(30.9)	17(15.5)	0(0.0)	96(87.3)	14(12.7)	0(0.0)	0(0.0)	80(72.7)	25(22.7)	5(4.5)	0(0.0)	x <sup>2</sup> =27.3 <0.001**	x <sup>2</sup> =17.8 <0.001**
Pain or discomfort in lower abdomen or genital area.	63(57.3)	29(26.4)	18(16.4)	0(0.0)	100(90.9)	9(8.2)	1(0.9)	0(0.0)	73(66.4)	29(26.4)	8(7.3)	0(0.0)	x <sup>2</sup> =21.6 <0.001**	x <sup>2</sup> =4.01 p= .404
Total characteristics X̄ ± SD Min- max	9.6±3.9 3 -16				3.4±4.5 0-14				5.2±3.3 0-15				x <sup>2</sup> =41.9 <0.001**	x <sup>2</sup> =30.2 <0.001**

x<sup>2</sup> —chi square test

statistically significant at P = < 0.05

highly statistically significant at P = < 0.001

P1 — Comparison between pre and post program

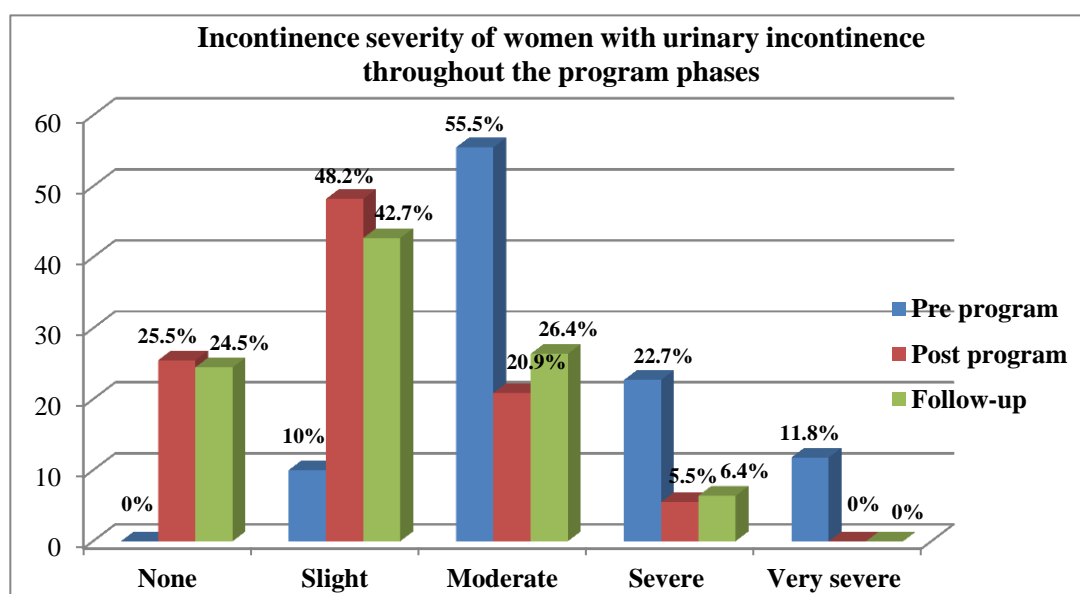
P2 — Comparison between pre and follow-up program



**Table 4:Percentage distribution of the studied women according to their weight, height and body mass index throughout the program phases (n= 110).**

Body mass index of the women	Pre program		Post program (after 3 months)		Follow-up (after 6 months)		Test of significance (X <sup>2</sup> )	
	n	%	n	%	n	%	P1	P2
<b>Weight /kgm:</b>								
50 < 70	28	25.5	27	24.5	28	25.5	21.08 <b>&lt;0.001**</b>	21.58 <b>&lt;0.001**</b>
70 < 90	29	35.5	51	46.4	48	43.6		
90 < 110	29	26.4	25	22.7	26	23.6		
≥ 110	14	12.7	7	6.4	8	7.3		
$\pm$ SD $\bar{X}$	82.8±1.9		80.9±17.7		81.1±1.7			
Min- max	55 - 126		55 - 126		55 - 122			
<b>Height /cm:</b>								
150 – 160	43	39.1	44	40.0	44	40.0	22.06 <b>&lt;0.001**</b>	22.06 <b>&lt;0.001**</b>
161 – 170	49	44.5	48	43.6	48	43.6		
171 – 180	18	16.4	18	16.4	18	16.4		
$\pm$ SD $\bar{X}$	163.9±6.1		163.9±6.1		163.9±6.1			
Min- max	155 - 177		155 - 177		155 - 177			
<b>Body mass index:</b>								
Under weight (< 18.5)	0	0.0	0	0.0	0	0.0	21.09 <b>&lt;0.001**</b>	19.25 <b>&lt;0.001**</b>
Healthy weight (18.5 – 24.9)	30	27.3	35	31.8	34	30.9		
Over weight (25 – 29.9)	28	25.5	25	22.7	26	23.6		
Obesity (30 -39.9 )	33	30.0	40	36.4	42	38.2		
Morbid obesity (≥ 40)	19	17.3	10	9.1	8	7.3		
$\pm$ SD $\bar{X}$	30.8±6.7		30.1±6.1		30.1±5.9			
Min- max	22.4 – 43.6		22.03 – 43.6		22.4 – 42.2			

X<sup>2</sup> —chi square test                      statistically significant at P < 0.05                      highly statistically significant at P > = 0.001  
 P1 — Comparison between pre and post program                      P2 — Comparison between pre and follow-up program



**Figure 1 : Percentage distribution of the studied women according to the severity of incontinence throughout the program phases (n=110)**

**Table 5 : Percentage distribution of the studied women according to the vaginal digital test and provocation test throughout the program phases (n=110).**

Vaginal digital test and provocation test	Pre program		Post program (after 3 months)		Follow-up (after 6 months)		Test of significance (X <sup>2</sup> )	
	n	%	n	%	n	%	P1	P2
<b>Ability to contract muscle (Vaginal digital test):</b>								
No contraction -	2	1.8	0	0.0	0	0.0	75.70 <0.001**	54.4 <0.001**
poor contraction -	81	73.6	6	5.5	9	8.2		
good contraction -	22	20.0	52	47.3	61	55.5		
Strong contraction -	5	4.5	52	47.3	40	36.4		
$\pm SD \bar{X}$	1.3±0.5		2.4±0.6		2.3±0.6			
<b>Urine leakage (Provocation test):</b>								
No leakage -	0	0.0	52	47.3	49	44.5	77.02 <0.001**	56.4 <0.001**
Slight leakage -	27	24.5	41	37.3	37	33.6		
Moderate leakage during first half of test -	62	56.4	14	12.7	21	19.1		
Severe leakage during the whole test -	21	19.1	3	2.7	3	2.7		
$\pm SD \bar{X}$	1.9±0.6		0.7±0.8		0.8±0.8			

chi square test statistically significant at P = < 0.05

highly statistically significant at P = < 0.001—x<sup>2</sup>

P1 — Comparison between pre and post program

P2 — Comparison between pre and follow-up program

**Table 6: Percentage distribution of women according to their quality of life throughout the program phases (n=110).**

Quality of life of the studied women	Pre program		Post program (after 3 months)		Follow-up (after 6 months)		Test of significance ( $\chi^2$ )	
	n	%	n	%	n	%	P1	P2
Ability to do household tasks.								
- None	14	12.7	0	0.0	0	0.0		
- Mild	57	51.8	3	2.7	5	4.5		
- Moderate	20	18.2	19	17.3	26	23.6	52.9	37.15
- Greatly	19	17.3	88	80.0	79	71.8	<0.001**	<0.001**
Ability to pray.								
- None	15	13.6	0	0.0	1	0.9		
- Mild	25	22.7	7	6.4	11	10.0		
- Moderate	44	40.0	31	28.2	33	30.0	11.04	80.52
- Greatly	26	23.6	72	65.5	65	59.1	<0.001**	<0.001**
Physical recreation such as walking, exercise and entrainment activities								
- None	29	26.4	0	0.0	0	0.0		
- Mild	40	36.4	7	6.4	10	9.1		
- Moderate	26	23.6	30	27.3	34	30.9	83.3	65.35
- Greatly	15	13.6	73	66.4	66	60.0	<0.001**	<0.001**
Ability to travel by car or bus > 30min.								
- None	24	21.8	0	0.0	1	0.9		
- Mild	62	56.4	7	6.4	9	8.2		
- Moderate	14	12.7	31	28.2	36	32.7	72.9	66.17
- Greatly	10	9.1	72	65.5	64	58.2	<0.001**	<0.001**
participation in social activities outside home.								
- None	55	50.0	0	0.0	1	0.9		
- Mild	26	23.6	2	1.8	5	4.5		
- Moderate	20	18.2	40	36.4	41	37.3	42.5	38.9
- Greatly	9	8.2	68	61.8	63	57.3	<0.001**	<0.001**
Emotional health (nervousness, depression).								
- None	19	17.3	87	79.1	78	70.9		
- Mild	2	1.8	13	11.8	21	19.1		
- Moderate	40	36.4	10	9.1	11	10.0	84.4	57.5
- Greatly	49	44.5	0	0.0	0	0.0	<0.001**	<0.001**
Feeling frustrated.								
- None	13	11.8	94	85.5	84	76.4		
- Mild	3	2.7	16	14.5	24	21.8		
- Moderate	41	37.3	0	0.0	2	1.8	47.8	24.9
- Greatly	53	48.2	0	0.0	0	0.0	<0.001**	<0.001**
$\pm$ SD $\bar{X}$	8.01 $\pm$ 2.9		18.7 $\pm$ 0.3		18.0 $\pm$ 3.1		t=14.94 .000	t=11.96 .000

highly statistically significant at P = &lt; 0.001

chi square test

statistically significant at P = < 0.05 — $\chi^2$ 

P1 — Comparison between pre and post program

P2 — Comparison between pre and follow-up program

**Table 7 : Percentage distribution of the studied women according to the degree of interference of urine leakage with their life throughout the program phases (n=110).**

Degree of interference of urine leakage with life	Pre program		Post program (After 3 months)		Follow-up (After 6 months)	
	n	%	n	%	n	%
0 (Not at all)	0	0.0	8	7.3	8	7.3
1	0	0.0	27	24.5	26	23.6
2	0	0.0	28	25.5	29	26.4
3	0	0.0	19	17.3	17	15.5
4	3	2.7	16	14.5	18	16.4
5	2	1.8	10	9.1	9	8.2
6	14	12.7	0	0.0	1	0.9
7	7	6.4	0	0.0	0	0.0
8	12	10.9	2	1.8	2	1.8
9	41	37.3	0	0.0	0	0.0
10 (Great)	31	28.2	0	0.0	0	0.0
$\bar{X} \pm SD$	8.5±1.6		2.4±1.6		2.5±1.6	
Min – Max	4 - 10		0 - 8		0 - 8	

## DISCUSSION

About half of all women experience stress incontinence (SUI), the most prevalent type of urine incontinence in Egypt. SUI, or unintentional urine incontinence, is defined as the loss of urine while coughing, sneezing, or exerting oneself (Almoussa & Bandin, 2018). It significantly affects daily tasks including job, travel, physical exercise, and sexual function as well as social interactions, which lowers quality of life (Lim et al., 2018). Additionally, SUI affects a patient's quality of life (QOL) in a number of ways, including how they interact with their families, their jobs, and their sexual function. .

Because SUI has a negative effect on their sexuality and privacy, people with SUI are frequently challenging to accept. According to Corrado et al. (2019), a lot of people are actually afraid to admit they have this issue and choose not to see a doctor for management and therapy.

According to the National Institutes of Health and Care Excellence (Li, Chen, Wang, Chen & Cai, 2021), pelvic floor exercises are the first-line treatment for SUI. helps maintain and increase the pelvic floor's strength and endurance, which benefits these muscles. Transverse abdominal contractions and PFM treatments thicken these muscles, making them potentially useful for enhancing SUI in middle-aged women. By

raising urethral pressure, enhancing bladder neck support, and reducing pee leakage, PFM training promotes well-timed conscious PFM contractions (Moustafa, 2022). So, this study was conducted to evaluate the effectiveness of pelvic floor muscle training program on the treatment of stress urinary incontinence with particular focus on the impact of this intervention on the women quality of life.

The current investigation revealed that most cognitive aspects have improved with regard to the study women's overall understanding of exercise incontinence over the course of the program phases. With a statistically significant difference, women's knowledge of exercise incontinence increased following the start of the training program compared to the pre-program phase.

This may be due to the fact that programs for strengthening the pelvic floor muscles were successful in increasing the knowledge of the women studied regarding urine incontinence. The study by Toos, Youssef, El-Bandrawy, and Bahaa (2019) found that most subjects had a significant difference in knowledge after using various poses of pelvic floor exercises for urine incontinence. This finding is consistent with that study.

Furthermore, Bulto (2021), who discovered that more than two-thirds of the women investigated had inaccurate understanding of the structural incontinence curriculum before compared to the post-training curriculum, concluded that this result was consistent with his findings.

Additionally, a study by Salmon et al. (2020) that shown a notable gain in subject knowledge lends weight to these findings. participants compared with low levels for stress incontinence. pre-educational knowledge; incontinence.

The current findings demonstrate a significant improvement in all aspects of urine characteristics during the program stages in the women studied who had urinary incontinence. Providing training with a statistically meaningful impact, follow-up after implementation addresses incontinence at later phases. unlike the last training program. As proof, only a minority of the women in the study reported leaking urine from exercise, coughing, or sneezing prior to the treatment while the majority did so in the immediate and postoperative periods.

The majority of the women in the study had several pregnancies, many births, and more than half of them underwent caesarean sections, which may have contributed to this outcome. Health services also don't adequately tell these women about all the facts regarding urinary incontinence.

Ismail ,Ibrahim, Rady and Habiba, (2019) observed in their study that while there was a very significant reduction in symptoms throughout the study groups, there were only little changes in the intensity of UI symptoms between the pre- and the control group after the intervention. Additionally, Abd El-Aty et al. (2021) showed that urine incontinence in the women investigated improved statistically significantly following the program's adoption. Kegel exercises are performed between the pre-test and post-comparative testing phases.

The present study found that women's body mass index was monitored throughout the program's phases, with a highly statistically significant difference found between women's BMI during the post-production stage and during the follow-up period following the implementation of the training program and before it did so. This could be due to the fact that the exercise program was superior to the pre-applying exercise program in terms of improving body mass index after the follow-up period and after the exercise program.

These results are consistent with Abd El-Aty et al., (2021) who demonstrated that a pelvic floor exercise program was effective in improving body mass index after the follow-up period and after exercise. perform the training program compared to the training program before applying for a job.

The current study's findings show that less than a quarter of the women tested had severe incontinence prior to the programme, which afterwards went away. This finding pertains to the intensity of urinary incontinence throughout the program phases. After three months and six months, a minority. The findings of this study could be attributed to the fact that women who participate in a pelvic floor muscle training program are better able to control their bladders and have less severe urine incontinence.

This finding is consistent with that of Mohamed, Hafez, and Basyouni (2018) who found that after performing the Kegels exercise, the intensity of stress urine incontinence symptoms in the control group's female participants changed. However, in the study group, the severity of these pronounced symptom reductions and the impairment brought on by

SUI symptoms varied significantly between the two study groups, with statistical improvements observed in women in the study group from prior to six years and twelve weeks after exercising Kegels.

The present study's findings revealed a statistically significant difference in categories of vaginal digital testing and post-provocation testing between the training and follow-up period and the pre-program period for the women studied throughout the program phases. Strong contractions were present in more than one-third of the women investigated in the pre-program period, but they declined to a minority in the post-program and follow-up periods. Additionally, during testing, one-third of the women in the study had serious leakage, however after the training program's post-training and follow-up phases, they tended to be in the minority.

These outcomes could be the consequence of the training program's success in reducing severe urine leakage, which in turn led to better test outcomes.

These findings concur with those of Cho and Kim, (2021), who found that the provocation test scores were significantly lower and the vaginal examination scores were higher in the post-test time compared to the pre-program period. Additionally, Okeahialam, Oldfield, Stewart, Bonfield, and Carboni (2022), who observed that provocation tests and vaginal examinations are helpful in determining arousal pelvic floor muscle tone, complement these findings.

The current findings demonstrate a significant increase in all aspects of the quality of life for the women tested at this level across all program phases. the next sentence and follow-up after the program has been completed. training regimen that differs from the last regimen in a statistically significant way.

This might be as a result of the women in the study having better awareness of how to deal with and manage urine incontinence, which led to an improvement in quality of life. Additionally, prior research supports a critical function for pelvic floor exercises in improving women's quality of life (Khatun, Hossain, Hossain & Urme, 2021).

Pourmomeny, Torkzadeh, and Zargham (2018) had a similar viewpoint when they stated that after PFMT, quality of life greatly improved. In addition, pelvic floor

muscle exercise significantly improved the quality of life for women with stress urine incontinence, according to Khatun et al. (2021).

Furthermore, Ismail Ibrahim, Rady, and Habiba (2019) found that women who use the pelvic floor muscle training program have significant improvements in their knowledge and quality of life. compared to before the exam, the follow-up.

## **CONCLUSION**

Based on the current findings, it can be concluded that; the training program have been helpful in improving the knowledge of the women studied concerning stress incontinence, according to the current data. Additionally, it was shown that the pelvic floor muscle training program improved the quality of life of the women who participated in the study and reduced stress urine incontinence.

## **RECOMMENDATIONS**

The current study recommended that making available manual for ongoing education and training about pelvic floor muscle exercises for all women with stress urinary incontinence. Additionally, in-service training for all nurse midwives and nurse educators on urine incontinence and pelvic floor muscle exercises as a method of prevention and treatment of urinary incontinence.



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## تأثير برنامج تدريبي لعضلات قاع الحوض علي جودة الحياة للسيدات المشخصات بسلس البول الإجهادي

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<sup>1</sup>ماجستير تمريض الأمومة والنساء والتوليد-كلية التمريض-جامعة بورسعيد،<sup>2</sup>أستاذ تمريض النساء والتوليد-كلية التمريض-جامعة بنها ،<sup>3</sup>مدرس طب النساء والتوليد-كلية الطب-جامعة بورسعيد،<sup>4</sup>أستاذ تمريض الأمومة والنساء والتوليد كلية التمريض جامعة بورسعيد،<sup>5</sup>أستاذ مساعد تمريض الأمومة والنساء والتوليد كلية التمريض جامعة بورسعيد.

### الخلاصة

**المقدمة:** يعد السلس البولي الإجهادي هو النوع الأكثر شيوعا بين أنواع السلس البولي والتي قد يكون لها تأثير علي جودة الحياة للسيدات بمختلف أعمارهم. **هدف الدراسة:** تحديد تأثير برنامج تدريبي لعضلات قاع الحوض علي جودة الحياة للسيدات المشخصات بسلس البول الإجهادي. **التصميم:** استخدام بحث شبه تجريبي لمجموعة واحدة. **مكان الدراسة:** عيادات النساء بمستشفى دار صحة المرأة ومستشفى الحياة ومراكز رعاية صحة أولية في مدينة بورسعيد. **عينة البحث:** تضمنت الدراسة ١١٠ من السيدات اللاتي يذهبن إلى عيادة النساء في الأماكن السابق ذكرها. **أدوات جمع البيانات:** استبيان تقييم حالة المرأة الصحية، استمارة استبيان مقابلة، استبيان قياس مدي تأثير سلس البول علي جودة الحياة ، واستبيان المتابعة. **النتائج:** بعد انتهاء البرنامج و أثناء المتابعة للبرنامج وجد تحسن في شدة السلس البولي حيث كانت (%٥,٥ & %٦,٤). وقد أظهرت نتائج البحث تحسن جودة الحياة للسيدات المصابات بالسلس البولي بمتوسط قدره (١٨.٧±٠.٣ ، ٣.١±١٨.٠) بينما قبل تطبيق البرنامج كان المتوسط قدره (٨.٠١±٢.٩)، أيضا قد أظهرت نتائج البحث تحسن في متوسط درجات معلومات السيدات عن السلس البولي قدره (١٢.٢±١.٢ & ١١.٣±١.٨). **الخلاصة:** كان لتنفيذ البرنامج التعليمي أثر فعال في تقليل السلس البولي و تحسين جودة الحياة للسيدات المصابات به. **التوصيات:** ضرورة اعطاء توجيهات للممرضات بتطوير برامج التعليم والتدريب عن عضلات قاع الحوض وضرورة معرفة التأثير الايجابي للبرامج التدريبية لعضلات قاع الحوض علي جودة الحياة للسيدات التي تعاني من السلس البولي .

**الكلمات المرشدة:** برنامج تدريبي لعضلات قاع الحوض- جودة الحياة - السلس البولي الإجهادي.