

## Effect of Pelvic Floor Stabilization Exercises on Symptoms and Quality of Life among Women with Stress Urinary Incontinence

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### Abstract

**Background:** Urinary incontinence (UI) is a significant and complicated illness that affects women. It has a negative effect on a woman's quality of life. Exercises for the pelvic floor muscles (PFM) are the most generally advised first-line therapy approaches. **Aim:** To evaluate the effects of pelvic floor stabilization exercises on symptoms and quality of life among women with stress urinary incontinence. **Methods:** A quasi-experimental research design was used. Conducted at the Gynecological outpatient clinics, Minia University Hospital for Obstetrics and Pediatrics, Egypt; a purposive sample included 80 women with UI divided into two groups (study and control), each group had 40 women, study group received pelvic floor stabilization exercise. Four tools were used; structured interview, Questionnaire for Urinary Incontinence Diagnosis, Incontinence Symptom Severity scale, and Incontinence Impact Questionnaire. **Results:** There was a highly statistically significant difference between the study and control groups regarding symptoms and quality of life among women with SUI after the intervention ( $p < 0.01$ ). **Conclusion:** Pelvic floor stabilization exercises were effective in improving symptoms and quality of life among women with SUI. **Recommendations:** Encourage using pelvic floor stabilization exercises as an effective way to treat urinary incontinence symptoms and improve women's quality of life.

**Keywords:** Pelvic Floor Stabilization Exercises, Quality Of Life, Stress Urinary Incontinence.

### Introduction:

Urinary incontinence (UI) is a health disorder that affects women's quality of life at various stages of their lives. The most common type of urine incontinence (UI) is stress urinary incontinence (SUI), which affects 50% of all women. Involuntary urine leaking during effort or physical exertion (e.g., sporting activities) or when sneezing or coughing is referred to as SUI (Almoussa & Bandin, 2018).

Urinary incontinence is a major public health issue worldwide. The prevalence of incontinence varies depending on the population analyzed. According to studies, 14% to 57% of women aged 20 to 89 years have or will have this problem at some point in their life (de Souza et al., 2019). In Egypt study shows that 27.7% of the studied women suffered from urinary incontinence of them, urge, stress and overflow were the most common with a prevalence of 72%, 45% , and 32% respectively (Soliman et al., 2019).

UI symptoms can range from little leaking to uncontrolled wetness. It is a widespread problem; specific data are difficult to get because many women are uncomfortable admitting symptoms to relatives, friends, or healthcare

professionals (Nightingale, 2019). UI is caused by several reasons, including weak pelvic floor muscles that support the proximal urethra, obesity, pregnancy and childbirth, advancing age, hysterectomy, and constipation. Caffeine and alcohol consumption increase the incidence of UI, urinary tract infections can induce transitory UI, and certain drugs can cause UI. All of these factors can have a significant impact on urine control (Price & Currie, 2019).

There are three basic forms of urine incontinence, according to the International Continence Society (ICS) Standardization Committee: SUI, Urge Urinary Incontinence (UUI), and Mixed Urinary Incontinence (MUI). In 50 percent of women aged 15 to 64, SUI is the most common type of UI (Bo et al., 2017).

Urinary incontinence has a significant influence on daily and social activities like job, travel, physical activity, and sexual function, lowering the quality of life (Lim et al, 2018). UI has an impact on many parts of patients' lives, including familial and job connections, as well as sexual function, and hence may lower their quality of life (QOL). UI is often hard to accept for people who suffer from it, due to its negative impact on their privacy and sexuality. Indeed, many people are embarrassed to disclose this

problem and do not consult doctors for management and treatment (Corrado et al., 2019).

Pelvic floor muscle training (PFMT) is the first-line treatment for SUI, according to the National Institute for Health and Care Excellence (Li et al., 2019), the pelvic floor exercises help in bracing the pelvic floor which in turn improves and maintains the strength and endurance of these muscles. The transverse abdominal muscle and PFM contraction exercise intervention thickens the transverse abdominal and hence may be indicated to improve SUI in middle-aged women. PFM training encourages conscious PFM contractions that are timed properly, increasing urethral pressure, improving bladder neck support, and preventing urine leakage (Khan et al., 2019).

Recent evidence suggests that pelvic floor stability exercises are useful for developing pelvic floor muscle strength and endurance, as well as transverse abdominal muscle strength and functional capacity. The recommendations for pelvic floor stabilization range from 10 to 30 repetitions per set, three to five times a day for six to twelve weeks (Khatun & Islam, 2019).

Nurses' role is encountered in giving the implications of the problem of incontinence for women, individuals, the family, and the community. Their role is being emphasized on the prevention of incontinence, improving and promoting quality of life for patients with continence problems (Younis & El-Deen, 2018). In developing new ways to prevent and control UI, nurses play an important role in fostering urinary continence. This position encompasses research-based practice, education, training, and implementation of high-quality practices. Furthermore, nurses teach women how to maintain good health, avoid complications, and aid in the restoration of normal function (El-Aty & Hassan, 2019).

#### Significant of the study:

About 20-60% of the Middle East complains about UI (Nazzal, et al 2019). In Egypt UI prevalence is difficult to estimate because most Egyptian women are refused to seek help regarding UI, but there are a few studies that scrutinized the prevalence rate of UI in some Egyptian districts. According to a study conducted in Assiut, the overall prevalence of UI

was 22.2 percent, with stress UI, urge UI, and mixed UI accounting for 5.7%, 5.1%, and 11.4%, respectively (Bahloul et al., 2017)

Urinary incontinence can have a detrimental impact on many parts of life, including physical activity, social interactions, and even sexual and psychological well-being (Pourmomeny et al., 2018). Although UI is frequent in Egypt; the prevalence rates are higher than in other countries. There is insufficient information to assess the effectiveness of pelvic floor exercise in lowering the severity of urinary incontinence symptoms and its effects on quality of life among Egyptian women (Ismail & Ibrahim, 2019)

Recent research suggests that pelvic floor stability exercises are useful for developing pelvic floor muscle and transverse abdominal muscular strength, as well as the functional ability (Khatun & Islam, 2019). However, PFMT requires adherence and correct technique to work. Lack of knowledge and skills for PFMT is a barrier to successful management of UI (Jaffar et al., 2019) and (Grant & Currie, 2019), so the researcher is interested in identifying the effects of pelvic floor stabilization exercises on improving symptoms and quality of life among women with SUI.

#### Aim of the study:

To evaluate the effects of pelvic floor stabilization exercises on:

- Symptoms of Stress Urinary Incontinence.
- Quality of life among women with Stress Urinary Incontinence

#### Research hypothesis:

- H1** Implementation of pelvic floor stabilization exercises have positive effect on symptoms among women with stress urinary incontinence
- H2** Implementation of pelvic floor stabilization exercises have positive effect on quality of life among women with stress urinary incontinence

#### Subjects and methods:

The subjects and methods of this study are displayed as the following

### Research Design:

The study used a quasi-experimental research design with a pretest-posttest control group. This study was chosen because it duplicates findings in the study and control groups before and after the intervention.

### Setting:

The research was carried out at the Gynecological outpatient clinics of the Minia University Hospital for Obstetric and Pediatric (MUHOP) in Egypt, which is located on the first floor of the hospital and consists of two rooms, one for taking history and examination and the other for a gynecological ultrasound. All of Upper Egypt is served by MUHOP.

### Sample:

A purposive sample of 80 women with urinary incontinence was generated. The sample size was calculated using the Epi info tool with a 95 percent confidence coefficient, a 10% acceptable error, a 50% predicted frequency, and a population size of 200. Each group of 40 women was separated into two groups: study (who used pelvic floor stabilization exercise) and control (who got regular hospital treatment).

### Inclusion criteria:

All women admitted to gynecological outpatient clinics, MUHOP, Egypt and accepted to participate in the study, with criteria of > 18 years old and experiencing uncomplicated UI, symptoms of urinary incontinence for at least three consecutive months, and had scored  $\geq 4$  on the Questionnaire for Urinary Incontinence Diagnosis (QUID).

### Exclusion criteria:

The study excluded women who met the following criteria:

- Previous anti-incontinence, pelvic prolapse repair, or urethral surgery within the preceding 12 months
- History of interstitial cystitis or bladder-related discomfort
- Renal or hepatic impairment that is clinically substantial
- Clinically significant heart impairment
- Positive urinary tract infection

- Pregnant or lactating women

### Tools of the study

There are four tools were used in this study:-

#### Tool (I): Structured interview questionnaire

It involved 1-personal characteristics such as age, residence, educational level, occupation, and BMI. 2- **Obstetric history** as gravidity, parity, mode of last delivery, the problem associated with last delivery, and age of the younger child.

#### Tool (II): Questionnaire for Urinary Incontinence Diagnosis (QUID):

The QUID's goal is to distinguish between the two types of urine incontinence: stress incontinence and urge incontinence. The stress domain is addressed in the first three questions, while the urge domain is addressed in the last three. Only the first three questions were utilized to diagnose SUI, which included urine leaking after coughing or sneezing, leaning down or picking something up, walking quickly, jogging, or exercising. It also enables individual prognosis and follow-up because it has six frequency response options ranging from "none of the time" (0) to "all of the time" (5). Totaling the replies to each item yields a score for each domain, with unique values for the SUI ranging from 0 to 15 points. Ideal cutoff values identify women as having SUI when the sub-scale is  $\geq 4$  (Bradley et al., 2010).

#### Tool (III): Incontinence Symptom Severity scale

It is a single domain inside The King's Health Questionnaire (KHQ) that includes 10 items including frequency, nocturia, urgency, urge incontinence, stress, intercourse, nocturnal enuresis, infections, discomfort, and trouble voiding. None, mild, moderate, and severe were assigned to these ten questions, with a score ranging from 0 to 3. The total Symptom Severity is scored from 0 (best) to 30 (worst)(Kelleher et al., 1997).

#### Tool (VI): Incontinence Impact Questionnaire (IIQ):

This scale was developed (Handa & Massof, 2004): The (IIQ) is a self-administered 30 items questionnaire used to assess the effect of UI on quality of life. The 30 items are further

divided into 4 domains or subscales which include physical activity (6 items), travel (6 items), social relationships (10 items), and emotional health (8 items). Each participant rated the extent to which UI affected her daily life functions on a 4-point ordinal scale (1 = not at all; 2 = slightly; 3 = moderately; 4 = greatly). A low score signifies a better quality of life compared to a high score (Handal & Massof, 2004).

#### **Tools Validity:**

The tools were reviewed by a team of five specialists in obstetrics and gynecological nursing, as well as obstetrics and gynecological medicine, for clarity and comprehensiveness.

#### **Tools Reliability:**

Reliability analysis was measured using the Cronbach Alpha coefficient and was found to be 0.832 for a structured interview questionnaire. The reliability of QUID, Incontinence Symptom Severity scale, and IIQ was found 0.910 and 0.961, and 0.835 respectively.

#### **Procedure:**

Before carrying out the study, an official letter was directed to the outpatient clinics manager of MUHOP, Minia University to obtain permission to collect data after specifying the purpose of the study.

#### **Ethical considerations:**

The faculty of nursing's Ethical Committee accepted the research proposal. An official letter from the faculty of nursing at Minia University was addressed to the responsible authorities, after explaining its intent, to obtain their permission to implement the study. Informed consent was obtained from each woman after explaining the aim of the study. Tools of data collection were not touched on the moral, religious, ethical, and cultural aspects of women's life. Confidentiality was maintained. The women had the right to withdraw from the study at any time.

#### **Pilot study:**

A pilot study was conducted on randomly selected 10% (8) women with USI, and these participants were excluded from the main study sample. To assess the clarity and applicability of the tools and to identify any difficulties that may be faced during the actual study. Minor

modifications were done for some mysterious statements, otherwise, almost all items were clearly understood and the responses were found appropriate.

#### **Fieldwork:**

Data collection and follow-up of the study took about 10 months starting at the beginning of February 2019 and was completed by the end of November 2019. It involved three phases as the following:

#### **Preparatory phase:**

The study questionnaire and booklet were prepared by the researchers based on reviewing different relevant literature. Women who met the inclusion criteria were interviewed individually at waiting area in front of Gynecological clinics to explain the nature and aim of the current study. After that, the researchers obtained their consent, then, the QUID was applied to the studied women, and whose had scored  $\geq 4$  was included in the current study. Structured interview questionnaire, Incontinence Symptom Severity scale, and IIQ were filled in as baseline information for the study and control group, who received routine hospital care (medication, pessary and advice of weight reduction).

#### **Supportive materials:**

Based on relevant literature, a booklet was created. It covers the anatomy and function of the pelvic floor muscles, the definition, risk factors, types, and the diagnosis of SUI. Factors that promote muscular strength, advantages of pelvic floor stabilization exercise, and how to execute pelvic floor stabilization exercise. Also, it included instructions regarding QOL and UI and illustrative images for the content. During the preparation, simple language and a beautiful presentation were considered. The booklet was then judged by a panel of five specialists in the fields of obstetrics and gynecology nursing, as well as obstetrics and gynecology medicine. After that, the needed modifications were done. 40 booklets were printed and given to each woman in the study group at the end of the training session before the beginning of the study.

#### **Implementation phase:**

- Using the computer generator method, the woman's group was determined. Both study

and control groups received routine hospital management.

- For the **study group**, an educational program was implemented for the studied women in four sessions per day. The **first session** involved welcome, anatomy of pelvic floor muscles, definition, risk factors, and types of urinary incontinence that took a time from 20-25 minutes. The **second session** included benefits, instruction, and technique of pelvic floor stabilization exercise (kegel exercise in a different position as lying on back, on the abdomen, sitting, standing, and walking). Provide explanation to stabilization exercise procedures such as stabilization during the bridge, diagonal stabilization, stabilization in the push-up, stabilization during squat, and stabilization during side bridge, all women's inquiries were answered, this took a time from 30-40 minutes. During the practical component of the exercise, women were instructed to contract pelvic floor muscles for 5 seconds, then rest for 5 seconds, with the duration of contractions and relaxations gradually increasing up to 10-seconds. Ten times through the contract/relax cycle. Instruct studied women to do it three times per day for six months.
- **The third session** involved repetition of the exercise to ensure that women knew how to perform it and distribution of educational material which prepared in Arabic language literature review. Took a time from 25-30 minute.
- **The fourth session** included healthy lifestyle education (such as weight reduction, avoiding a long time standing, avoiding lifting heavy objects, consuming food rich in vitamins, and drinking too much fluid in the morning and afternoon rather than at night). Took a time from 20-25 minute. All session was given in the ultrasound room.
- Various methods used for education and training like lecture, PowerPoint, video and demonstration.
- Exercise logbook was maintained to ensure that all studied women perform their exercise regularly.

### Evaluation phase:

Women were asked to come for follow up at Gynecological clinic weekly to ensure their intervention to exercises regularly and correctly. The researchers assessed the severity of symptoms among studied women using the Incontinence Symptom Severity scale, and their quality of life using IIQ for the study and control group by the end of 6 months (after implementation).

### Statistical analysis:

The collected data were organized, categorized, coded, tabulated, and analyzed using Statistical Package for Social Sciences (SPSS) V.26. In tables and charts, data was represented using numbers, percentages, means, and standard deviations. A T-test was used to assess the mean difference between the study and control groups. The chi-square test was used to establish statistical significance regarding categorized variables. A statistically significant was adopted at a P-value of  $\leq 0.05$ .

### Limitation of the study:

Some women not came for follow up at some visits. The researchers call them and follow all instruction regarding exercises and applying it regularly and correctly by telephone.

### Results:

**Table (1):** illustrates sociodemographic characteristics and reports that 62.5% of studied women in the study group and 55% in the control group had age  $>50$  years. Concerning living areas, 47.5% in the study group and 55% in the control group were from rural areas. As regards educational level 52.5% and 42.5% in the study and control group had a secondary level of education respectively. Regarding occupation, 72.5% of studied women in the study group and 77.5% in the control group were housewives. About 45% and 37.5% in the study and control group were obese, with no statistically significant difference between the study and control group ( $P > 0.05$ ).

**Table (2):** Clarifies obstetric history of studied women and illustrated that 80% of studied

women in the study group and 87.5% in the control group were multigravida and multipara. Cesarean section was the mode of delivery in 55% and 60 % of the study and control groups. About 27.5% of studied women in the study group and 20% in the control group had a previous history of obstructed labor. Also, 10% and 47.5% in the study group and 12.5% and 45% in the control group had a perineal tear and episiotomy respectively. Concerning age of the younger child, about 45% and 37.5% of studied women in the study and control group their younger children age were >20 years respectively, with no statistically significant differences between the study and control groups ( $P>0.05$ ).

**Table (3)** shows that there were no statistically significant differences between the study and control groups regarding SUI's symptoms before intervention ( $P>0.05$ ), while after intervention there were highly statistically significant differences between the study and control groups ( $P<0.01$ ).

**Figure (1):** Demonstrates that there was no statistically significant differences between the study and control groups regarding total SUI's symptoms severity before intervention ( $P>0.05$ ),

**Table (1):** Distribution of studied women according to socio-demographic characteristics in study and control group (N= 80):

Socio-demographic characteristics	Study group		Control group		X <sup>2</sup> P-value
	N(40)	%	N(40)	%	
<b>Age/ years</b>					
• < 40 years	5	12.5	4	10.0	2.42
• 40-50 years	10	25.0	14	35.0	
• > 50 years	25	<b>62.5</b>	22	<b>55.0</b>	
<b>Age mean±SD</b>	<b>50.2±8.9</b>		<b>51.3±11.2</b>		
<b>Residence</b>					1.12
• Rural areas	19	<b>47.5</b>	22	<b>55.0</b>	<b>0.290</b>
• Urban areas	21	52.5	18	46.0	
<b>Educational level</b>					
• Illiterate	8	20.0	9	22.5	2.23
• Basic education	6	15.0	7	17.5	
• Secondary education	21	<b>52.5</b>	17	<b>42.5</b>	
• University or higher	5	12.5	7	17.5	
<b>Occupation</b>					0.667
• Working	11	27.5	9	22.5	<b>0.414</b>
• Housewives	29	<b>72.5</b>	31	<b>77.5</b>	
<b>BMI</b>					
• Underweight(<18.5)	0	0.0	0	0.0	1.32
• Normal (18.5-25)	8	20.0	10	25.0	
• Overweight (>25-30)	14	35.0	15	37.5	
• Obese (>30)	18	<b>45.0</b>	15	<b>37.5</b>	

while after intervention there was highly statistically significant difference between the study and control groups ( $P<0.01$ ).

**Table (4):** Shows the quality of life's mean and SD before and after intervention in the study and control group, and reported that were no statistically significant differences between the study and control groups before intervention ( $P>0.05$ ), while after intervention there were highly statistically significant differences between the study and control groups ( $P<0.01$ ).

**Table (5):** Clarifies the relationship between sociodemographic characteristics studied women in the study and control group, and total SUI's symptoms severity before intervention, and revealed that there was a highly positive relationship between SUI's symptoms severity before the intervention and women's age, residence, occupation, and BMI in the study and control group ( $P<0.01$ ).

**Table (6):** Illustrates that there was a positive correlation between UI symptoms severity and total women's quality of life before intervention with a highly statistical significant 0.001 and 0.000 regarding study and control group respectively.

**Table (2):** Distribution of studied women according to obstetric history in study and control group (N= 80):

Obstetric history	Study group		Control group		X <sup>2</sup> P-value
	N(40)	%	N(40)	%	
<b>Gravidity</b>					
• Non	2	5.0	1	2.5	2.17
• Primigravida	6	15.0	4	10.0	
• Multigravida	32	<b>80.0</b>	35	<b>87.5</b>	<b>0.338</b>
<b>Parity</b>					
• Non	2	5.0	1	2.5	2.17
• Primipara	6	15.0	4	10.0	
• Multipara	32	<b>80.0</b>	35	<b>87.5</b>	<b>0.338</b>
<b>Mode of last delivery</b>					0.631
• Normal delivery	18	46.0	16	40.0	
• Cesarean section	22	<b>55.0</b>	24	<b>60.0</b>	<b>0.427</b>
<b>Problem with last deliveries</b>					
<b>Difficult labor</b>					1.75
• Yes	11	<b>27.5</b>	8	<b>20.0</b>	
• No	29	72.5	32	80.0	<b>0.186</b>
<b>Perineal tear</b>					0.313
• Yes	4	<b>10.0</b>	5	<b>12.5</b>	
• No	36	90.0	35	87.5	<b>0.576</b>
<b>Episiotomy</b>					0.125
• Yes	19	<b>47.5</b>	18	<b>45.0</b>	
• No	21	52.5	22	55.0	<b>0.723</b>
<b>Age of younger child</b>					4.99
• <15 years	9	22.5	6	15.0	
• 15-20 yeas	13	32.5	19	47.5	
• > 20 years	18	<b>45.0</b>	15	<b>37.5</b>	<b>0.082</b>

**Table (3):** Distribution of studied women according to SUI's symptoms severity before and after intervention in study and control group (N= 80):

UI's symptoms		Before intervention		X <sup>2</sup> p-value1	After intervention		X <sup>2</sup> P-value2
		Study group	Control group		Study group	Control group	
		N(%)	N(%)	N(%)	N(%)		
<b>Increased urinary frequency</b>	None	1(2.5)	0(0.0)	<b>4.25</b>  <b>0.235</b>	23(57.5)	1(2.5)	<b>94.3</b>  <b>0.001**</b>
	Mild	5(12.5)	3(7.5)		9(22.5)	6(15.0)	
	Moderate	10(25.0)	12(30.0)		6(15.0)	14(35.0)	
	Severe	24(60.0)	25(62.5)		2(5.0)	19(47.5)	
<b>Nocturia</b>	None	0(0.0)	2(5.0)	<b>6.85</b>  <b>0.077</b>	33(82.5)	12(30.0)	<b>64.33</b>  <b>0.001**</b>
	Mild	2(5.0)	2(5.0)		4(10.0)	8(20.0)	
	Moderate	3(7.5)	5(12.5)		3(7.5)	7(17.5)	
	Severe	35(87.5)	31(77.5)		0(0.0)	13(32.5)	
<b>Urgency</b>	None	10(25.0)	11(27.5)	<b>2.97</b>  <b>0.395</b>	29(72.5)	14(35.0)	<b>44.48</b>  <b>0.001**</b>
	Mild	7(17.5)	5(12.5)		8(20.0)	9(22.5)	
	Moderate	5(12.5)	8(20.0)		3(7.5)	5(12.5)	
	Severe	18(45.0)	16(40.0)		0(0.0)	12(30.0)	
<b>urge incontinence</b>	None	12(30.0)	10(25.0)	<b>1.70</b>  <b>0.636</b>	27(67.5)	15(37.5)	<b>19.51</b>  <b>0.002**</b>
	Mild	10(25.0)	12(30.0)		8(20.0)	12(30.0)	
	Moderate	11(27.5)	12(30.0)		4(10.0)	10(25.0)	
	Severe	7(17.5)	6(15.0)		1(2.5)	3(7.5)	
<b>Stress incontinence</b>	None	0(0.0)	0(0.0)	<b>1.82</b>  <b>0.628</b>	24(60.0)	3(7.5)	<b>99.82</b>  <b>0.001**</b>
	Mild	3(7.5)	2(5.0)		12(30.0)	6(15.0)	
	Moderate	5(12.5)	4(10.0)		4(10.0)	8(20.0)	
	Severe	32(80.0)	34(85.0)		0(0.0)	23(57.5)	
<b>Nocturnal</b>	None	31(77.5)	30(75.0)	<b>1.60</b>  <b>0.659</b>	35(87.5)	32(80.0)	<b>10.61</b>  <b>0.005**</b>
	Mild	5(12.5)	6(15.0)		5(12.5)	4(10.0)	
	Moderate	2(5.0)	3(7.5)		0(0.0)	4(10.0)	
	Severe	2(5.0)	1(2.5)		0(0.0)	0(0.0)	
<b>Intercourse incontinence</b>	None	0(0.0)	1(2.5)	<b>4.08</b>  <b>0.252</b>	30(75.0)	22(55.0)	<b>9.32</b>  <b>0.025*</b>
	Mild	10(25.0)	8(20.0)		6(15.0)	10(25.0)	
	Moderate	12(30.0)	10(25.0)		3(7.5)	5(12.5)	
	Severe	18(45.0)	21(52.5)		1(2.5)	3(7.5)	
<b>Waterworks infections</b>	None	15(37.5)	17(42.5)	<b>2.36</b>  <b>0.499</b>	30(75.0)	22(55.0)	<b>11.2</b>  <b>0.011**</b>
	Mild	9(22.5)	11(27.5)		7(17.5)	9(22.5)	
	Moderate	10(25.0)	8(20.0)		2(5.0)	6(15.0)	
	Severe	6(15.0)	4(10.0)		1(2.5)	3(7.5)	
<b>Bladder pain</b>	None	32(80.0)	33(82.5)	<b>3.32</b>  <b>0.345</b>	40(100.0)	34(85.0)	<b>16.22</b>  <b>0.003**</b>
	Mild	5(12.5)	4(10.0)		0(0.0)	3(7.5)	
	Moderate	3(7.5)	2(5.0)		0(0.0)	3(7.5)	
	Severe	0(0.0)	1(2.5)		0(0.0)	0(0.0)	
<b>Post void dribble</b>	None	27(67.5)	26(65.0)	<b>1.32</b>  <b>0.723</b>	35(87.5)	28(70.0)	<b>11.11</b>  <b>0.004**</b>
	Mild	7(17.5)	8(20.0)		5(12.5)	10(25.0)	
	Moderate	5(12.5)	4(10.0)		0(0.0)	2(5.0)	
	Severe	1(2.5)	2(5.0)		0(0.0)	0(0.0)	

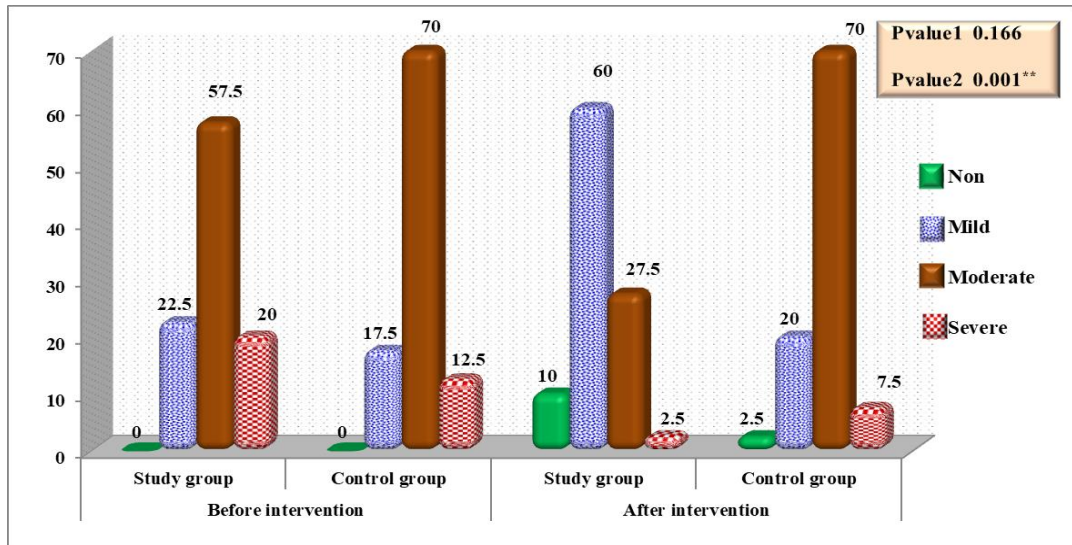
(\*\*) highly statistical significant difference

p-value1 between study and control group before intervention

p-value2 between study and control group after intervention



**Figure (1):** Distribution of studied women according to total SUI's symptoms severity before and after intervention in study and control group (N= 80):



(\*\*) highly statistical significant difference  
 p-value1 between study and control group before intervention  
 p-value2 between study and control group after intervention

**Table (4):** Distribution of studied women according to quality of life's mean and SD before and after intervention in study and control group (N= 80):

Variables	Before intervention		After intervention	
	Study group	Control group	Study group	Control group
	Mean±SD	Mean±SD	Mean±SD	Mean±SD
Physical activity	20.51±2.9	20.24±3.2	14.46±3.1	18.12±5.1
T-test p-value	2.02 <b>0.542</b>		18.51 <b>0.002**</b>	
Travel or transportation	19.90±3.2	20.17±2.8	17.24±1.1	19.23±2.5
T-test p-value	3.83 <b>0.224</b>		28.3 <b>0.001**</b>	
Social relationships	34.92±4.1	33.81±3.9	29.01±2.1	31.28±3.2
T-test p-value	3.98 <b>0.236</b>		10.01 <b>0.008**</b>	
Emotional health	28.22±2.7	28.45±3.1	24.36±1.1	26.24±2.1
T-test p-value	3.62 <b>0.392</b>		33.4 <b>0.001**</b>	
Total scores	103.55±4.6	102.67±4.3	85.07±2.8	94.87±5.3
T-test p-value	1.91 <b>0.675</b>		23.9 <b>0.001**</b>	

**Table (5):** Relation between socio-demographic characteristics and UI's symptoms severity before intervention in study and control group (N= 80):

Socio-demographic characteristics	UI's symptoms severity before intervention in study group			P-value1	UI's symptoms severity before intervention control group			P-value2
	Mild (9)	Moderate (23)	Severe (8)		Mild (7)	Moderate (28)	Severe (5)	
	N(%)	N(%)	N(%)		N(%)	N(%)	N(%)	
<b>Age/ years</b>								
• < 40 years	4(44.5)	1(4.3)	0(0.0)	<b>0.001**</b>	3(42.8)	1(3.6)	0(0.0)	<b>0.001**</b>
• 40-50 years	2(22.2)	6(26.1)	2(25.0)		2(28.6)	10(35.7)	2(40.0)	
• > 50 years	3(33.3)	16(69.6)	6(75.0)		2(28.6)	17(60.7)	3(60.0)	
<b>Residence</b>								
• Rural areas	4(44.5)	8(34.8)	7(87.5)	<b>0.001**</b>	2(28.6)	16(57.1)	4(80.0)	<b>0.001**</b>
• Urban areas	5(55.5)	15(65.2)	1(12.5)		5(71.4)	12(42.9)	1(20.0)	
<b>Educational level</b>								
• Illiterate	2(22.2)	5(21.7)	1(12.5)	0.118	2(28.6)	6(21.4)	1(20.0)	0.061
• Basic education	2(22.2)	3(13.0)	1(12.5)		2(28.6)	4(14.2)	1(20.0)	
• Secondary education	4(44.5)	12(52.3)	5(62.5)		2(28.6)	13(46.5)	2(40.0)	
• University or higher	1(11.1)	3(13.0)	1(12.5)		1(14.3)	5(17.9)	1(20.0)	
<b>Occupation</b>								
• Working	4(44.5)	3(13.0)	4(50.0)	<b>0.001**</b>	2(28.6)	4(14.2)	3(60.0)	<b>0.001**</b>
• Housewives	5(55.5)	20(87.0)	4(50.0)		5(71.4)	24(85.8)	2(40.0)	
<b>BMI</b>								
• Normal (18.5-25)	2(22.2)	6(26.1)	0(0.0)	<b>0.001**</b>	2(28.6)	8(28.6)	0(0.0)	<b>0.001**</b>
• Overweight (>25-30)	4(44.5)	8(34.8)	2(25.0)		3(42.8)	11(39.3)	2(40.0)	
• Obese (>30)	3(33.3)	9(39.1)	6(75.0)		2(28.6)	9(32.1)	3(60.0)	

(\*\*) highly statistical significant difference

p-value1 between study and control group before intervention

p-value2 between study and control group after intervention

**Table (6):** Correlation between UI symptoms severity and total women's quality of life before intervention in study and control group:

			Study group	Control group
			Symptoms	Symptoms
Study group	Quality of life	Pearson Correlation	0.511**	
		Sig. (2-tailed)	0.001**	
		N	40	
Control group	Quality of life	Pearson Correlation		0.611**
		Sig. (2-tailed)		0.000**
		N		40

(\*\*) highly statistical significant difference

### Discussion:

Urinary incontinence is a complex and serious condition that can affect women. It is not only a significant physical disease, but also an undeniable psychosocial problem that causes embarrassment and negatively affects a woman's quality of life. Early detection of the UI and proper pharmaceutical and non-pharmacological treatment, including pelvic floor stabilization exercise, play a critical role in enhancing women's quality of life and preventing symptoms from worsening (Kozakiewicz et al, 2018).

Based on the current findings, present study illustrates that there was no statistically significant difference between the study and control groups regarding total SUI's symptoms severity before intervention ( $P>0.05$ ), while after intervention there was highly statistically significant difference between the study and control groups ( $P<0.01$ ).

On the same line (Younis & El-Deen, 2018), who applied their study in Egypt to assess the effect of pelvic floor muscle exercise on stress urinary incontinence among women on pelvic radiation, and reported that there was no statistically significant difference between the study and control groups regarding total UI's symptoms severity before the intervention, while after intervention there was highly statistically significant difference between the study and control groups.

And (Khan et al., 2019), who carried out their study in India to assess the combined effects of core muscle and pelvic floor exercises on SUI in women, and showed improvement in UI symptoms after giving PFM training. Also (Radzińska et al., 2018), they completed their

research to determine the efficacy of pelvic floor muscle training (PFMT) in the treatment of UI in women, with an emphasis on the effects of this type of therapy on the patients' quality of life. This is due to the fact that urethral closure is maintained by the endopelvic fascia's appropriate support and the tonic contraction of the levator ani muscles. Pelvic floor training, when done correctly, restores the capacity to contract these muscles in a timed and coordinated manner, improving or restoring continence.

Concerning UI's symptoms, current findings illustrate minor changes in the symptoms in the control group, while there was a significant improvement in the study group, with highly statistically significant differences between the study and control groups after intervention regarding frequency, nocturia, urgency, urge incontinence, stress, intercourse, nocturnal enuresis, infections, discomfort, and trouble voiding p-value  $<0.01$ .

Similar to previous findings (Ismail & Ibrahim, 2019), who applied their study in Egypt to determine the effect of kegel's exercise on the severity of urinary incontinence and quality of life among menopausal women, and reported that there were minor changes in UI's symptoms severity between control group before and after the intervention, while there was a highly significant improvement in symptoms between the study group.

Also (Lee et al., 2017), who implemented their study in Korea to evaluate the effect of PFME on UI in elderly women with mild cognitive impairment (CI), and showed that there was an enhancement in UI's symptoms after applying PFME. All previous findings support the

importance of PFE as the main part of UI management and improvement in women's symptoms.

Regarding women's QOL in the study and control groups, actual findings clarify that there was no statistically significant differences between the study and control groups before intervention ( $P>0.05$ ), which was changed to highly statistically significant differences between both groups after intervention ( $P<0.01$ ), with improvement in women's QOL in the study group after intervention.

The same opinion was reported by (Pourmomeny et al., 2018), they conducted research to examine the impact of specific pelvic floor muscle training (PFMT) on the quality of life of women with urinary incontinence and discovered that QOL increased dramatically after the implementation of PFMT. And (Khatun et al., 2019), who conducted their study in Bangladesh to see if maximum repetition of pelvic stabilization exercise affects the management of stress urinary incontinence in women, and found that pelvic floor exercise had a significant impact on associated quality of life for women with stress urinary incontinence.

Also, previous findings agreed with (Ismail & Ibrahim, 2019), and (Ptak et al., 2019), who performed their study in Spain to assess the impact of isolated PFM exercises and combined training of the PFM on the QoL of patients with SUI in relation to the number of vaginal deliveries. And (El-Aty & Hassan, 2019) who carried out their study in Egypt to evaluate the effect of kegel exercise training program on the quality of life among women with urinary incontinence. From the researchers' point of view, all previous findings ensure the vital role of pelvic floor exercise on positively progress in women's QoL.

As regards the relationship between socio-demographic characteristics studied women in the study and control group, and total SUI's symptoms severity before intervention, the present findings revealed that there was a highly positive relationship between SUI's symptoms severity before intervention, and women's age, residence, occupation and BMI in the study and control group ( $P<0.01$ ).

In agreement with previous findings, (Sohn et al., 2018), who achieved their study to investigate the characteristics of patients with UI and to assess its association with other geriatric health problems, and illustrated that there was a positive relationship between women's age and BMI and UI's symptoms. This similarity illustrates that woman UI symptoms were increased with advanced and increased weight.

### **Conclusion:**

Based on the findings of the present study, pelvic floor stabilization exercises were effective in improving symptoms and quality of life among women with SUI.

### **Recommendations:**

- Encourage using pelvic floor stabilization exercises as an effective way to treat urinary incontinence symptoms and improve women's QOL.
- Prepared a booklet with simple instructions and illustrations that are utilized in hospitals such as a teaching aid for incontinent women.
- Applying the present study under different circumstances as setting, duration of management, and larger sample to generalize its results.

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