

EFFECT OF PELVIC FLOOR MUSCLE STRENGTHENING-KEGEL'S EXERCISE- ON SEVERITY OF STRESS URINARY INCONTINENCE AND QUALITY OF LIFE AMONG WOMEN

¹Hanan Gaber Mohamed, ²Samar K. Hafez, ³Niven R. Basyouni

¹Assistant professor of Medical Surgical Nursing, Faculty of Nursing, Banha University, Egypt

²Assistant professor of Obstetric and Gynecologic Nursing, Faculty of Nursing, Alexandria University, Egypt

³Assistant professor of Obstetric and Gynecologic Nursing, Faculty of Nursing, Alexandria University, Egypt

Corresponding author; dr.niven@hotmail.com

Abstract: Stress Urinary Incontinence (SUI) is called as a silent epidemic which is not a life threatening condition, but a worldwide problem at the same time. It affects the quality of life of at least one third of women globally in many ways and may limit women's social and personal relationships.

Research design: A Quasi experimental pre/posttest design was utilized.

Setting: The study was conducted in the urinary incontinence clinic of Alexandria Regional Center for Women's Health and Development.

Subjects: A total sample of 60 women with stress urinary incontinence was recruited by a purposive sampling approach. They were assigned randomly into two equal groups. Group (I) study group comprised of 30 women; were given Kegel's exercise training program in addition to their routine care. Group (II) control group consisted of 30 women; were receiving the routine care only. The study subjects who were willing to participate in the study were selected according to eligibility criteria.

Tools of the study: Four tools were used by the researchers namely; Tool 1: Basic data interview schedule, it included three parts, part i: Socio-demographic and obstetric history, part ii: Daily workload level and part iii: usual urination pattern. Tool II: Modified Oxford Grading Scale is a reliable and valid vaginal palpation rating scale, used to measure pelvic floor muscle strength. Tool III: Urogenital Distress Inventory - short form (UDI-6) and Tool IV: The modified Arabic version of Incontinence Impact Questionnaire (IIQ-7).

Findings: No statistically significant difference was found between the two groups in relation to their socio-demographic characteristics, for age, marital status and educational level. A highly statistically significant difference was found between the control and study groups, in relation to their mean pelvic floor muscle strength, symptoms of UI and impact on Quality of Life before Kegels' exercise compared to the end of twelve weeks of the study after training.

Conclusion and Recommendations: This study concluded that; Kegel's exercise for a duration not less than six weeks is an effective practice for SUI in women. It also, has significant positive effect on strengthens pelvic floor muscle, reducing SUI symptoms and significantly improves the QOL of women with SUI, which is a vital indicator of their psychosomatic, emotional, and social functions.

Keywords: Pelvic floor muscle strengthen, kegel's exercise, stress urinary incontinence.

1. INTRODUCTION

Stress Urinary Incontinence (SUI) is defined by the International Continence Society as “the complaint of involuntary leakage of urine with physical exertion, effort, sneezing, straining and coughing”⁽¹⁾. Its prevalence varies at 10–39%. It is reported that about half of women with urinary incontinence (UI) describe symptoms of stress incontinence^(2, 3). The prevalence of UI among Egyptian Women is under estimated and is relatively higher when compared to reports from other ethnic groups. It was mentioned by a study in Assuit 2007 that 54.8% of a sample drawn from women, aged twenty years and above suffered from UI and 14.8% of them complained of SUI, which is the most common type of urinary incontinence among women⁽⁴⁾.

Basic cause of stress urinary incontinence is the weakness of pelvic floor muscles supporting the proximal urethra. Hence, the intra vesicle pressure exceeds the maximal urethral pressure during exertion which results in increased intra-abdominal pressure⁽⁵⁾. Women of different geographic and ethnic groups have a different distribution of symptoms, different conditions causing their stress urinary incontinence with different risk profiles. The influencing factors of SUI can be divided into categories that *predispose, incite, promote, or intervene* change in pelvic floor disorders⁽⁶⁾. *Predisposing* factors such as menopause; which is as an aging process associated with a higher risk of SUI among women that may be related to general loss of muscle tone, long-term effects of injuries experienced during parturition, and/or changes in hormonal stimulation. Where, reduced estrogen levels in menopausal women may contribute to incontinence^(6, 7). Major *inciting* factors for urinary incontinence include damage to the pelvic floor due to pregnancy and childbirth. Numerous studies reveal a reasonable to significant raise in the relative risk of pelvic floor muscle disorders and weakness among parous opposed to nulliparous women^(6, 8). Fortunately; other factors can be corrected to *promote* the condition; including obesity and smoking. Evidence suggests that the prevalence of stress incontinence increases proportionately to a rising body mass index (BMI) where the increased intra-abdominal pressure due to a rising BMI may reduce the continence gradient between the urethra and the bladder^(8, 9). Smoking has been associated with an increased risk of urinary incontinence directly or indirectly through smoking-related illnesses that cause increased coughing. *Intervening* factors include drug therapies and surgery. Also, mechanical pressure as in, tumors of the bladder or pelvis and /or medical conditions as diabetes^(8, 10). Medications as diuretics can directly contribute to bladder over activity. In addition, neurologic condition compromise central nervous system control of the bladder causing urge incontinence^(11, 12).

Stress Urinary Incontinence (SUI) is called as a silent epidemic which is not a life threatening condition, but a worldwide problem at the same time. It affects the quality of life of at least one third of women globally in many ways and may limit women’s social and personal relationships^(1, 12). SUI starts gradually over time and increases, often to the point of causing women to stop doing many of their normal activities. Obviously, in women suffering from stress urinary incontinence, leakages are the most important factor affecting the quality of life adversely⁽¹³⁾.

It causes wetness, odor, discomfort, and skin irritation; it can also damage self-esteem as a result of feelings of shame, embarrassment and stigmatization^(14, 15). Also, women with SUI usually suffer of affected sexual relationships because of the fear of urine leakage during sexual activity. Despite of these, only a quarter of all women with this problem seek medical support^(16, 17). Some women have SUI of a mild nature and do not feel that treatment of the condition is warranted; others are embarrassed to speak with a health care provider about their condition or fear that treatment will require surgery⁽¹⁸⁾.

Literally, evidence reveals that SUI exerts a negative impact on multiple components of health related quality of life, including working life, emotional and social life, finances, sexual life, and self-esteem⁽¹⁹⁾. Little research, however, has investigated the way in which women manage the distressing symptoms associated with SUI and how self-management strategies vary, depending on work and lifestyle commitments. It is therefore very important to offer adequate treatment and nursing interventions to cure the problem among women suffering from SUI for both physical and psychological impact and substantially quality of life disturbance^(19, 20).

Pharmacological managements for stress urinary incontinence are many and varied; include use of removable devices, as well as more invasive surgical procedures. Unfortunately to date, no medication is approved by the Food and Drug Administration for curing SUI. Additionally, medications often used, such as estrogens and alpha-adrenergic, its

effectiveness had not been proven yet. ⁽²¹⁾. Pelvic floor muscle strengthens (Kegel's) exercises are usually the initial non-pharmacological treatment option. It involves the repetitive contraction of the pelvic floor muscle, which builds strength and perineal support, and improves muscle tone ^(22, 23). Moreover, strengthening the pelvic floor muscles helps to support the bladder, decreases frequency and urgency of urination and increase in endurance translates in to better holding capacity and less or no episode of leakage ⁽²⁴⁾.

Studies have shown up to 70% improvement in symptoms of stress incontinence following appropriately performed Kegel's exercise. This improvement is evident across all age groups; the degree to which a woman will succeed with pelvic floor muscle exercises has shown to depend partly on the severity of their incontinence. Nurses' researchers have recognized the value of vaginal test in measuring pelvic floor muscle strength, and in evaluating the effectiveness of the kegel's exercise ⁽²⁴⁾. The exercise instructions, motivation and the quality of the follow-up supervised by nurses make the deference ⁽²⁵⁾. So in another words, barrier to the treatment of SUI is the common lack of health education provided by nurses in caring for and evaluating the condition. As nurses become more aware of the impact of SUI, as well as its evaluation and management, more women with the disorder will find the appropriate care available to them. Health care professionals caring for women with SUI should develop a trusting relationship in which women feel comfortable discussing current strategies that may adversely impact on health ⁽²⁶⁾.

Significant of the study:

In Egypt the exact magnitude of the problem among women is unknown and underestimated with much debate occurs regarding the risk factors for SUI ⁽⁴⁾. Moreover, incontinence has been shown to affect personal relationships and cause women to cease employment, increase dependence on caregivers and restrict activities of daily life. Thus; it is difficult to establish the true magnitude of the problem, otherwise the applications and maneuvers to overcome such impact ⁽²⁷⁾. Here a question arises around the kegel's exercise effectiveness in reducing the symptoms' severity of stress urinary incontinence in women with a particular focus on the impact of this form of practice on their quality of life which impact seriously on their physical activities, social and emotional relationships. Furthermore, the role of nurse in education and motivation for this exercise is also very important factor for success of such technique. Although, the previously mentioned triggers for the need for researches concerning the comprehensively role of Kegel's exercise in management of such toll; yet the research studies in Egypt are scares. Subsequently, the current research is done to investigate such impact of this practice among women who are suffering more and getting less quality of care.

2. MATERIALS AND METHOD

Aim of the study:

This study is done to evaluate the effect of pelvic floor muscle strengthening-kegel's exercise - on severity of stress urinary incontinence and quality of life among women

Hypothesis:

Women with stress urinary incontinence who practice Kegel's exercise exhibit more pelvic floor muscle strength, less severity of their incontinence' symptoms and less disturbed quality of life than those who don't

Research design:

A Quasi experimental pre/posttest design was utilized to fulfill the aim of the study.

Setting:

The study was conducted in the urinary incontinence clinic of Alexandria Regional Center for Women's Health and Development

Subjects:

A total sample of 60 women with stress urinary incontinence was recruited by a purposive sampling approach. They were assigned randomly into two equal groups. Group (I) study group comprised of 30 women; were given Kegel's exercise training program in addition to their routine care. Group (II) control group consisted of 30 women; were receiving the routine care only.

International Journal of Novel Research in Healthcare and Nursing

Vol. 5, Issue 3, pp: (421-438), Month: September - December 2018, Available at: www.noveltyjournals.com

The study subjects who were willing to participate in the study were selected according to the **following inclusion criteria at screening**;

1. Age ranging from 45 to 55 years old
2. Non obese women, have a calculated body mass index (BMI) $19 \leq \text{BMI} \leq 32$ and/or $50 \leq \text{total body weight} \leq 80$
3. Non-smokers
4. Free from any associated chronic diseases and/or conditions
5. Free from any gynecological disorders and/or complications
6. Willing and able to comply with scheduled visits, treatment plan, and other study procedures as specified to them.

Subjects who meet any of the following **exclusion criteria** were not enrolled in this study:

1. Current acute urinary tract infection (UTI) or reproductive tract infection otherwise history of these infections within 7 days prior to receipt of the study.
2. Intake of diuretics or other drugs which can interfere with the study results.

These predefined criteria were chosen to guarantee consistency of the study execution and freedom from any bias.

Tools: Four tools were used by the researchers:

Tool I: Basic data interview schedule

This tool was developed by the researchers after extensive review of relevant literature. It included three parts:

Part I: Socio-demographic and obstetric history:

1. Socio-demographic characteristics including: age, level of education, occupation, and marital status.
2. Obstetrical history such as: gravidity, parity and number of living children

Part II: Daily work load and usual urination pattern:

- Daily work load as; heavy work with standing for long periods and movement with pushing heavy object more than 40kg

Part III: Usual urination pattern:

- Usual urination pattern such as; leakage of urine during sexual intercourse, behavior upon urinary urgency like Postponing urination for a long period of time and number of waking up for urination at night.

Tool II: The Modified Oxford Grading Scale ⁽²⁸⁾

Modified Oxford Grading Scale is a reliable and valid vaginal palpation rating scale used by the obstetric researchers to measure pelvic floor muscle strength. The ability to contract and relax the pelvic floor muscles is first evaluated by vaginal palpation and asking the woman to pull her pelvic floor muscles around the examiner's finger in and up as strongly as possible and then to relax them completely. When a correct contraction was verified, the examiner scored as: 0=no contraction; 1=flicker (slight pressure); 2=weak (slight to medium pressure); 3=moderate (medium pressure for less than 5 seconds); 4=good (hard pressure for less than 5 seconds); and 5=strong (powerful pressure for more than 5 seconds).

Tool III: Urogenital Distress Inventory - short form (UDI-6) ⁽²⁹⁾

It assesses the existence and/or severity of SUI. The severity of SUI's symptoms is classified according to woman's response to the UDI-6 which composed of six questions. These questions are divided into three subscales: the first (irritative) subscale (Q1 and 2), the second (stress) subscale (Q3 and 4) and the third obstructive /discomfort subscale (Q5 and 6). Each question as a 4-point response scale and women were asked to rate the severity of their incontinence (0, not at all; 1, slightly; 2, moderately; 3, greatly). Woman's response as "greatly" was considered as severe incontinence. The

International Journal of Novel Research in Healthcare and Nursing

Vol. 5, Issue 3, pp: (421-438), Month: September - December 2018, Available at: www.noveltyjournals.com

mean value of all the answered items must be divided by 6 and multiplied by 25 to obtain the Index of Urinary Problems (IUP). IUP would be in the range of 0 to 100 where 0 means no impairment. The index in the range 1-25 means slight impairment, 26-50 – moderate, 51-75 – substantial and 75-100 – severe impairment.

Tool IV: The modified Arabic version of Incontinence Impact Questionnaire (IIQ-7)⁽³⁰⁾

It is modified by the author to suit the Egyptian culture. It contains seven questions about the impact of stress urinary incontinence on daily functioning and quality of life. Sub scales were created for the IIQ-7 as follows: prayer (item 1), physical activity (items 2 and 3), social/travel (items 4 and 5) and emotional health (items 6 and 7). Item responses are assigned values of 0 for “not at all”, 1 for “infrequently”, 2 for “frequently”, and 3 for “Almost always”. The question inquiring about prayer was changed from the classic description to the new description to be clear and specific to quantify the exact impact of SUI on prayer: 0, not at all; 1, makes me repeat the ritual cleansing; 2, makes me repeat the prayer; 3, almost makes me stop praying.

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 disturbance.

Method:

1. Administrative approval:

An official Permission to carry out the study was obtained from the directors and the responsible specialist of the chosen setting after explaining the aim of the study.

2. Tools development:

Tool (I) was developed by the researchers based on the review of relevant literature. Tool (II), (III), (IV) and the Kegel's exercise training were adopted.

3. Validity and reliability:

- Tool I were revised by 9 experts in the fields of obstetric and medical surgical nursing for their content validity. The tool was designed in its final format and reliability was assured by cronbach's alpha 0.80.
- The Kegel's exercise training⁽³⁰⁾ was translated into Arabic language and revised by the same experts and the necessary modifications were done.
- Tool II is a reliable and valid vaginal palpation rating scale used to measure pelvic floor muscle strength.
- Tool III Adapted from Uebersax JS, et al. It is a valid and reliable record to assess the existence and/or severity of SUI
- Tool IV is a modified Arabic version costumes the Egyptian culture which is valid and reliable to assess the impact of stress urinary incontinence on daily functioning and quality of life.

4. Pilot study:

It was done on (6) women who were excluded from the sample to test the clarity, and applicability of the tools (Tool 1) and to estimate the time required to fill the sheet. Modifications were done by the researchers.

5. Data Collection:

Collection of data consumed 5 months starting from mid-March till end of July 2018.

6. Field of work

The study was conducted through the following phases:

Assessment phase:

- The researchers interviewed each woman from the control and study groups individually and privately to get consent to participate in the study.

International Journal of Novel Research in Healthcare and Nursing

Vol. 5, Issue 3, pp: (421-438), Month: September - December 2018, Available at: www.noveltyjournals.com

- Basic data were identified for both groups using tool I.
- Initial assessment was done using study tools (II, III, IV) for both groups to be like a base line data to evaluate any progress alongside it. It included the following;
 - Pelvic floor muscle strength was measured using tool II (The Modified Oxford Grading Scale). Where the woman was asked to lie down on the bed in supine position with knees bent and focus on the perineal area and completely relax the perineal area. Then the obstetric researcher performs vaginal palpation by inserting two gloved lubricated fingers inside the vagina, and asking the woman to contract her pelvic floor muscles just like when she holds the urine and she had to try to pull the researcher's finger upward and inward. A grade according to the tool was given. Confirmation of the given grade; was garneted by another obstetric researcher who blindly repeat the examination to the same woman.
 - The severity of SUI symptoms and its impact on quality of life were evaluated by the researchers using tool III& IV.

Implementation phase:

- Kegel's exercise training was executed for women participated in the study group while receiving their routine care. The control group obtained the routine care only.
- Each woman in the study group was interviewed and face-to-face education was given about the anatomy and function of the pelvic floor muscles, definition of SUI, factors improve muscle strength, definition and benefits of kegel's exercise.
- Training about the Kegel's exercise was practiced according to the subsequent steps:
 - Ask each woman from the study group individually and privately to choose a comfortable position. As Kegel's exercises can be performed when sitting, standing and laying. It is recommended that the woman exercise in each position every day
 - Start with the number of seconds that the subject holds the contraction. Tell the woman to pretend that urine is falling out. Tighten the muscles that would hold it in.
 - Double time for Squeeze the pelvic floor muscles for 5 seconds then relax for 5 seconds. The goal is to progress to 10 second holds, followed by 10 seconds of relaxation. Repeat 10 times. Follow with 2 sets of 5 strong, quick contractions.
 - Throughout the day, perform three sets of these pelvic floor exercises.
 - Instruct the subject to make Kegel's part of daily routine. These exercises can be performed anywhere at any time. Try to make it routine when doing a daily task such as taking a shower, brushing teeth, watching TV, or commuting. Habits are formed with repetition.
 - Instruct subjects to relax completely between each exercise to avoid spasm and pain
 - Instruct woman; not to use the muscles in stomach, thighs or buttocks. Place hand on abdomen; if she feels her abdomen move, she is using stomach muscles so the woman must repeat the exercise.
 - Ask her to breathe freely and don't hold her breath.
 - Never do Kegel's exercises when she is tired.
- Kegel's exercise training session ranged from 20 to 30 minutes depending on individual women's level of education, and the environmental circumference. Needed enforcement was done by the researcher throughout woman's subsequent visits.

Evaluation phase:

- It is a longitudinal phase done through the sixth and twelfth week of intervention for both the study and control groups.
- Reassessment and evaluation of the effect of Kegel's exercise on pelvic floor muscle strength, stress urinary incontinence symptoms and quality of life among women were done using tools (II, III & IV) for both groups.
- Comparisons and statistical relations were done to identify the effect of Kegel's exercise on the previously mentioned parameters.

7. Ethical consideration:

Each woman was individually contracted and informed about the aim of the study in order to obtain her informed consent. Again, each of those who agreed to participate was assured about confidentiality, privacy and right to withdraw at any time.

Statistical Analysis:

Collected data were analyzed and evaluated using the SPSS version 21.0. Descriptive statistics including percentage, mean, and standard deviation were calculated. A repeated measure ANOVA with a Greenhouse-Geisser correction and Post hoc tests using the Bonferroni correction were used for multiple comparisons of continuous variables between time points (pre – post1 and post2) according to normal distribution. A P-value less than 0.05 was considered to be statistically significant.

3. RESULTS

Table (1) shows that 43.4% of the control group and 30.0% of the study group were aged from forty-five to fifty years old. But women aged more than fifty to fifty-five years old represent 56.6% and 70.0% of the control and study group, respectively. Regards marital status, majority of the control and the study groups 83.3% & 86.7%, respectively were married. While minority of both groups (6.7% & 13.3%) in that orders were widow and 10.0 % of the control groups as well as none of the study group were divorced. Concerning level of education, it was obvious that 10.0% and 6.7% of the control group and the study groups respectively were illiterate. Moreover, 13.3% of the control group and 6.7% of the study group could just read and write. In addition, two fifth (40.0%) of the control and 43.3% of the study groups had secondary education. However, women who have finished university education or above, signify 36.7% of the control group and 43.3% of the study group. No statistically significant difference was found between the two groups in relation to their socio-demographic characteristics, ($P= 0.501, 0.158 \text{ \& } 0.784$) for age, marital status and educational level, respectively. All study subjects were Muslims.

Table (2) clarifies that both the control and the study groups were relatively similar pertaining to the number of gravid and deliveries, where half 50% of the control group and 46.7% of the study group were pregnant and delivered more than three. About nature of previous deliveries, three fifth and more (60.0% & 63.4%), respectively of both groups had delivered vaginally. No statistically significant difference was found between both groups in relation to their reproductive history, $P= (.424, .551, \text{ \& } .583)$ for number of gravida, number of deliveries, nature of previous deliveries correspondingly.

Table (3) demonstrates that more than one fifth (23.3%) of the control group compared to more than one third (36.7%) of the study group were not working. While working with sitting was found among 20.0% and 30.0% of both the control and study group in that order. Work with standing light was stated by 20.0% and 10.0% of the control and study group respectively. Whilst, work with Standing moderate-heavy was mentioned by less than one fifth (16.7%) of the control group compared to minority (3.3%) of the study group. Walking with carrying heavy objects or movement with pushing heavy object more than 40kg represents the similar proportion (10.0%) among the study group. Where one fifth (20.0%) of the control group were walk with carrying heavy objects and none of them move with pushing heavy object more than 40kg. The two study groups were homogenous with no statistically significant difference among them as regards their Work load ($P=.101$)

Table (4) exemplifies that 16.7% of the control group and 13.4% of the study groups were excluded from the study subjects when asking about leakage of urine during sexual intercourse; as they were either widow or divorced. It was obvious that equal proportions of the control group, more than two fifth (44.0%) either sometimes or mostly leak urine during sexual intercourse while more the half (56.0%) of women enrolled in the study group mentioned the previously mentioned complain as it occurs sometimes and around one third (32.0%) of them leak urine during sexual relation mostly. Two fifth (40%) of both groups equally declared that they wait a little till finishing work as a behavior upon urinary urgency and the same percent of women participated mutually in study groups mentioned that they go to the toilet at least once a night. No statistical variation was calculated among both study groups regarding usual urination pattern ($P > 0.05$)

Table (5) displays that at the beginning of the study; good contraction of pelvic floor muscle strength was not observed among any of the control or study groups. The mean score of the pelvic floor muscle strength was almost equal (2.2 ± 0.8 & 2.4 ± 0.7) respectively. No statistical significant difference was illustrated between control and study groups ($P=0.307$), which assures homogeneity of the two researchable groups. Among women enrolled in the control group, good contraction of pelvic floor muscle was observed among 10% after both six and twelve weeks of routine care. What's more, minimal increase was detected in the mean pelvic floor muscle strength of control group from 2.2 ± 0.8 before routine care to be 2.5 ± 0.7 after six weeks and 2.6 ± 0.6 after twelve weeks. But those women showed no statistical significant difference before and after six as well as twelve weeks of routine care ($P=0.128$ & 0.886) consecutively. After implementation of Kegel's exercise among women participated in the study group, it was revealed that good contraction increased from none before Kegel to 10% after six weeks of training. But, the mean score of pelvic floor muscle strength before and after 6-weeks of Kegel's training was (2.4 ± 0.7 vs. 2.8 ± 0.7) respectively, without any statistically significant difference ($p = 0.335$). Improvement was found after the twelve weeks of exercise where the women with good contraction of pelvic floor muscle reached less than one fifth (16.7%). In addition, the mean score of pelvic muscle strength had been increased to be 3.2 ± 0.8 , with statistically significantly different compared to before Kegel's training ($P=0.000$). A highly statistically significant difference was found between the control and study groups, in relation to their mean pelvic floor muscle strength, at the beginning compared to the end of twelve weeks of the study ($P=0.000$).

Table (6) clarifies that symptoms such as, frequent urination, urine leakage related to the feeling of urgency, urine leakage related to physical activity (coughing or sneezing), small amounts of urine leakage (that is drops), difficulty emptying bladder and/or pain or discomfort in the lower abdominal or genital area, which experienced *greatly* reversed among subjects in the control group from 23.3%, 20.0%, 83.3%, 83.3%, 16.7% & 46.7% respectively at the beginning of the current study and before routine care to 20.0%, 20.0%, 60.0%, 46.6%, 13.3% & 20.0% consecutively after six weeks of care. And further to 20.0%, 26.7%, 53.3%, 60.0%, 20.0% & 20.0% correspondingly after twelve weeks of routine care. But such previously mentioned symptoms suffered *greatly* by women in the study group decreased from 26.7%, 40.0%, 76.7%, 96.7%, 13.3% & 23.3% in that order before Kegel's exercise to 10.0%, 13.3%, 70.0%, 43.0%, 10.0% & 10.0% respectively after six weeks of training. Further promote to these symptoms among women participated in the study group to be 10.0%, 10.0%, 26.7%, 30.0%, 6.7% & 10.0% successively after twelve weeks of Kegel's exercise.

Table (7) determines that "not at all or slight impairment" were not mentioned by women joined to either the control or the study groups. The mean values of SUI symptoms' impairment were 73.5 ± 2.9 and 74.6 ± 1.5 for both control and study groups, consecutively. No statistical different was calculated among both groups at the beginning of the study, $P=0.070$.

The control group illustrated that proportion for sever SUI symptoms' impairment remains; more than three fifth (70% to 66.7%) before and after six weeks of routine care respectively. the percent remains the same (66.7%) after twelve weeks. The mean of stress urinary incontinence' impairment of the control group was (73.5 ± 2.9) before-routine care decreased a little to 72.4 ± 3.4 six weeks and twelve weeks after routine care consecutively. No statistical significant difference was found among women in the control group before and after six as well as twelve weeks of routine care ($P=0.183$ & 0.160) respectively. Study group, elicited a decrease in sever SUI symptoms' impairment from more than two thirds (70%) before Kegel to be less than half (46.7%) after six weeks and twelve weeks of excises. The mean score decreased from 74.6 ± 1.5 before Kegel to be 62.3 ± 2.2 after 6-weeks of training, which was statistically significant ($p = 0.000$). Further improvement was found, as the mean of symptoms' impairment decreased to 59.9 ± 2.6 , with highly statistically significantly different between before Kegel to 12-weeks after it ($p = 0.000$). A highly statistically significantly difference was observed between the control and study groups, ($P=0.000$) with improvement of the study group after Kegel's exercise for twelve weeks.

Table (8) clarifies that quality of life activities such as; prayer, ability to do household chores cooking, housecleaning and/or laundry, physical recreation such as walking, swimming and/or other exercise, ability to travel by car or bus more than 30 minutes from home, participation in social activities outside home, emotional health disturbances such as nervousness, and/or depression and/or feeling frustrated, deteriorated at *almost always* level among women in the control group from 20.0%, 16.7%, 26.7%, 50.0%, 40.0%, 33.3% & 46.7% in that order before-routine care to 13.3%, 26.7% 53.3%, 36.7%, 33.3%, & 50.0% respectively after six weeks of routine care. Further alteration of these activities among women participated in the control group to be 36.7%, 26.7%, 36.7%, 60.0%, 46.7%, 20.0% & 23.3% successively after

twelve weeks of routine care. On the other hands, such previously mentioned activities improved and the impact "*almost always*" reduced for most items among women in the study group from 50.0%, 23.3 %, 63.3%, 90.0%, 30%, 66.7% & 73.3% respectively before- Kegel's exercise to 36.7%, 3.3%, 16.7%, 56.7%, 13.3%, 16.7% & 20.0% consecutively after six weeks of Kegel's exercise. And additional decline, for those items, which shows further improvements, to 6.7%, 3.3%, 13.3%, 20.0%, 13.3%, 20.0% & 23.3 correspondingly after twelve weeks of demonstration of Kegel's exercise.

Table (9) demonstrates that at the beginning of the study majority of women (90% & 70%) in both control and study groups respectively suffered from severe degree of negative impact on their QOL. "Not at all disturbance" was mentioned by neither the control nor the study group. The mean QOL disturbance among both control and study groups were 74.2 ± 8.7 and 75.1 ± 6.8 respectively, with no statistical significant difference between both groups ($P=0.657$).

Although slight decrease was observed in the negative impact on Quality of Life amongst the control group, it still circulates around sever disturbance (90% & 80%) before and after six also twelve weeks after routine care correspondingly. The mean score was 74.2 ± 8.7 before and 72.5 ± 13.5 six weeks after routine care. This value became 69.3 ± 18.6 twelve weeks after that care. Women of the control group show no statistical significant difference between before and after routine care ($P = 0.564$ & 0.196) consecutively. Among women enrolled in the study group, it was revealed that Kegel's exercise, elicited a decrease in the negative impact of SUI on Quality of Life from sever disturbance 70% before-Kegel to 53.3% after 6-weeks and advanced to 40% after 12-weeks of exercise. The mean values of such impact were (75.1 ± 6.8 , 68.8 ± 10.1 & 56.7 ± 16.2) before and after six as well as twelve weeks respectively. Statistically significant difference was calculated among women in the study group before and after 6-weeks of demonstration, ($p = 0.006$). In addition, a highly statistically significantly difference was found between women before Kegel compared to 12-weeks after training, ($P=0.000$). A highly statistically significant difference was found between the control and study groups in relation to their SUI impact on Quality of Life ($p < .000$).

4. DISCUSSION

Among numerous needs and problems menopausal women suffer from; SUI arises as the most important issue affecting the quality of life adversely⁽⁴⁾. The current study accepted the hypothesis that Kegel's exercise is a restorative management for this problem and associated with enhancement in strength of the pelvic floor muscles.

Finding of the present study showed that twelve weeks of Kegel's exercise elucidate statistically significant increase in pelvic floor muscle strength. Fitz et al, (2014)⁽³¹⁾ is congruent with such result, who mentioned that, women with SUI improved greatly in relation to pelvic floor muscle strength after the first eight-weeks of demonstrating Kegel. Also, Sharaf et al, (2010)⁽³²⁾ revealed that proportion of women with good contraction of pelvic floor muscle increased considerably after practicing Kegel. On the other hand, researchers found that the improvements in pelvic floor muscle strength was not pronounced early in the sixth week and had its greatest effect at twelfth week. This result is supported by Chitra (2016)⁽³³⁾ 34 who found that it takes near fifteen weeks of regular exercise for result to be noticeable.

This study finding is incongruent with Marques (2018)⁽³⁴⁾, who mentioned that performing Kegel's exercise regularly for 4-6 weeks helps strengthening the pelvic floor muscle. It is obvious that "regularly" is the key word as performance of Kegel infrequently or improbably is not enough to reveal advances. Other attributing factors may exist among present study subjects including; age, menopause, number of pregnancies and labors as well as work load and usual urinary pattern; which may delay the positive effect of Kegel.

It is clear that current study participants were menopause with its aging adverse effects necessarily occur. Besides a sizable proportion of them go through pregnancy and delivered vaginally for more than three times, have a heavy work load and prejudicial urinary habits as postponing urination for a period of time. Edibe (2016)⁽³⁵⁾ supported the idea that age and menopausal state are attribution factors interfering with Kegel's effect. They added that age was statistically correlated to SUI and concluded that the older age; more the problem is confronted especially in menopausal women due to decreased levels of estrogen hormone which weaken pelvic floor muscles.

On the same line, Betschart & Wisser (2017)⁽³⁶⁾ presumed that pregnancies and labors damage the pelvic floor muscle. They documented that women suffer from urinary incontinence four times more than men due to multiple trauma from child birth who affects the pelvic floor muscle.

Regarding women's workload and urination habits, Yoonjung & Yeunhee (2017)⁽³⁷⁾ supported the idea that work load and postponing urination can be presumed factor weaken the pelvic floor muscle and interfere with effects of Kegel's training. They reported that urinary incontinence was prevalent in working women, compared to unemployed women; it was significantly associated with awkward position for long periods, and carrying heavy weights. Therefore, managing work load along with Kegel can have a great influence on strengthen pelvic floor muscle.

Results of inventory UDI-6 illustrated that the greatest episode of urinary dribbling was linked to coughing, laughing or sneezing. This complain was mentioned, before Kegel's training, by almost equal proportions among women of both control and study groups. This result is aimilar to Agnieszka et al (218)⁽³⁸⁾ who found that women with SUI suffer a lot. This could be clarified by the 'precautionary" action mad by women with SUI, e.g., intentional tightening of the pelvic floor muscles just before any changing posture coughing or sneezing. The woman develops into orientation with her exact arousal cause for the escape of urine. Of course women are so frustrated and tired of this voluntarily non habitual control of the sphincter and pelvic muscles to decrease the incidence of dribbling.

On the other hand, the picture was different after implementation of Kegels exercise, as the severity of stress urinary incontinence symptoms experienced by women joined to control group were fluctuated. But among the study group, these symptoms clearly decreased and the impairments due to SUI's symptoms differ significantly between both research groups with statistical improvements were observed amongst women of the study group from before to six and twelve weeks after Kegel's exercise. Finnbogadóttir et al⁽³⁹⁾ agree with this finding who reported that about one quarter of women receiving pelvic floor muscle strengthening training were cured and that majority of them reported improvement in their symptoms. The current result is similar to a study carried out by Marzieh et al, (2015)⁽⁴⁰⁾ who found that more than half of women who received Kegel's exercise training pronounced their SUI as "not a problem" after treatment compared with minority of controls. Moreover, Gilmour (2017)⁽⁴¹⁾ reported that women who performed Kegel's training had at least a fifty percent decreased urine loss compared to controls.

It was understandable that the impact of SUI symptoms' severity on women's QOL is huge. In this study and before Kegel's practice, the control and study groups were symmetrical without any significant difference. When asking women "Has urine (incontinence) affected your ability to do daily activities", "almost always" was the popular answer. Similar results were reported by Ghafouri (2014)⁽⁴²⁾. In the same line, Opara et al, (2014)⁽⁴³⁾ and Mohammed et al, (2015)⁽⁴⁴⁾ found that many features of women's life are interrupted, including emotional welfare, inter-personal communications, and activities, marital and societal relationships. The researcher reported that SUI disturbs social life, with many boundaries and constrains regarding going to open places, traveling for recreation or even work, and sometimes having a spare time with relatives or friends. Furthermore, women with such complain never speak to anybody about her problem, even her husband, because those women were embarrassed of having urine odor or being wet in public. However, the SUI symptoms impact varies from woman to woman, some seek help just to get ride of wetness, and others believe only a full cure is acceptable. Surprising that, some women accept these restrictions and limits on their standard of living as an expected outcome of aging.⁽⁴⁵⁾

In this study, all women were complaining of interruption of their prayer due to urine incontinence. This complain is greatly disturbing quality of life especially among Muslim women who are obligated to repeat ritual washing needed before prayer and if they pass urine involuntary or experience incontinence, they become impure and prayer is denied. El-Azab et al,⁽³⁰⁾ supported this result. Hence they found in the research conducted in Assuit – Egypt that vast majority of SUI women suffered of interruption of their prayers time table related to urinary leakage. This issue can critically impair QOL and mentioned that something like prayer is pointing to a deep ethnic difference especially for Arab and Egyptians Muslims.

After performance of Kegel, the study group demonstrated improvements in approximately all the functioning items related to their quality of life while the control group was still showing alteration of those items. These results are most similar to those reported by Cavkaytar et al (2014)⁽⁴⁶⁾ who reported that women gained a major enhancement in quality of life after Kegel. In addition, Hussein (2015)⁽⁴⁷⁾ concluded that Kegel's training is very effective in reducing SUI and improving QOL.

Significantly the study clarified the improvement of SUI symptoms and QOL in women who performed Kegels' exercise. The results consistently show the reinforcement of pelvic floor muscle contractility strength and validate that Kegel's exercise is needed a safe method of nursing management.

5. CONCLUSION

In the light of the present study results, it can be concluded that; Kegel's exercise for a duration not less than six weeks is an effective practice for SUI in women. Nurses could describe the exercise to women. As Kegel has a great advantage of being easy and can be done at any time without being noticed by others. It also, has significant positive effect on strengthens pelvic floor muscle, reducing SUI symptoms and significantly improves the QOL of women with SUI, which is a vital indicator of their psychosomatic, emotional, and social functions.

6. RECOMMENDATIONS

- Kegel's exercise training can be used as an effective management for treating SUI symptoms and improving QOL among women
- Qualitative research is needed to evaluate the experience of SUI among women.

REFERENCES

- [1] Soni N., A. Rahule, V. Sagdeo. Evaluation of Effect of Kegel Exercise for the Management of Stress Incontinence in Women of Gujrat, India. J Cont Med A Dent September-December 2014 Volume 2 Issue 3 20-23.
- [2] Cavkaytar S., Kokanali M. K., Topcu H. O., Aksakal O. S. & Doğanay M. Effect of home-based Kegel exercises on quality of life in women with stress and mixed urinary incontinence. Journal of Obstetrics and Gynecology, 2014; 1-4
- [3] W. S. Reynolds, R.R. Dmochowski, D.F. Penson Epidemiology of stress urinary incontinence in women. CurrUrol Rep (2011) 12:370–376
- [4] El-Azab A S., Mohamed E. M., and Sabra H. I. The prevalence and risk factors of urinary incontinence and its influence on the quality of life among Egyptian women. Neurourology and Urodynamics. 2007 26:783–788
- [5] The Global Forum on Incontinence About incontinence. Available from: <http://www.gfiforum.com/incontinence>, accessed January 15, 2018.
- [6] Jennifer L. Hallock and Victoria L. Handa. The epidemiology of pelvic floor disorders and childbirth: an update. Obstet Gynecol Clin North Am. 2016 Mar; 43(1): 1–13.
- [7] Radzimińska A, Strączyńska A, Styczyńska H, and Strojek K. The impact of pelvic floor muscle training on the quality of life of women with urinary incontinence: a systematic literature review. Clinical Interventions in Aging. 2018;13:957—965
- [8] Barbara L. Hoffman, John O. Schorge, Karen D. Bradshaw, Lisa M. Halvorson, Joseph I. Schaffer, Marlene M. Corton. Williams Gynecology, CHAPTER 23: Urinary Incontinence. Third Edition. USA, 2016.
- [9] Yoshitaka Aoki, Heidi W. Brown, Linda Brubaker, Jean Nicolas Cornu, J. Oliver Daly, and Rufus Cartwright. Urinary incontinence in women. Nat Rev Dis Primers. 2017 Jul 6; 3: 17042.
- [10] Uma Singh, Pragati Agarwal, Manju Lata Verma, Diwakar Dalela, Nisha Singh, and Pushplata Shankhwar. Prevalence and risk factors of stress urinary incontinence in Indian women: A hospital-based survey. Indian J Urol. 2013 Jan-Mar; 29(1): 31–36.
- [11] S.H Park¹ and C.B.Kang. Effect of kegel exercises on the management of female stress urinary incontinence: A systematic review of randomized controlled trials. Advances in Nursing. 2014
- [12] Evaluation of Effect of Kegel Exercise for the Management of Stress Incontinence in Women of Gujrat, India. J Cont Med A Dent September-December 2014 Volume 2 Issue 3.
- [13] Bilgic D. & Beji NK. Lower urinary tract symptoms in women and quality of life. International Journal of Urological Nursing, November 2010; 4.Issue105.
- [14] Marcin, Z., Daria. K., Maria, M., Daria, P., Marcin, O., & Irena, M. The impact of pelvic floor exercises on the quality of life of women with urinary incontinence – Analysis of pregnancy and the Postpartum Period. J Nov Physiother Phys Rehabil. 2017, 4(2): 035-041.

International Journal of Novel Research in Healthcare and Nursing

 Vol. 5, Issue 3, pp: (421-438), Month: September - December 2018, Available at: www.noveltyjournals.com

- [15] -Tso, C., DNP, FNP-BC, CRP, & Lee, W. Postmenopausal women and urinary incontinence. *American nursing today*. 2018; 13 (1).
- [16] Saboia, D., Firmiano, M., Bezerra, K., Neto, J., Oriá, M., & Vasconcelos, C. Impact of urinary incontinence types on women's quality of life. *Rev. esc. enferm. USP*. 2017; 5 (1).
- [17] Ghodsbin F, Kargar M, Jahanbin I, Sagheb M. M. The Efficiency of a Behavioral Intervention Program for Urinary Incontinence in Elderly Females. *J Nurs Care*. 2012; 1:6.
- [18] Hermansen IL, O'Connell BO. Women's explanations for urinary incontinence: Their management strategies and their quality of life during the postpartum period. *WOCN* 2010; 37(2):187-92.
- [19] Nilsson M, Lalos O, Lindkvist H, Lalos ANN. How do urinary incontinence and urgency affect women's sexual life? *ActaObstetrica et GynecologicaScandinavica* 2011; 90(6):621-28.
- [20] Nelasa, P., Duartea, J., Diasa, A., Chavesa, C., Coutinhoa, E., & Amarala, O. Vulnerability to stress and quality of life of women with urinary incontinence. *Procedia - Social and Behavioral Sciences*. 2016; 217, 1118–1123.
- [21] Emma Maund, Louise Schow Guski, and Peter C. Götzsche. Considering benefits and harms of duloxetine for treatment of stress urinary incontinence: a meta-analysis of clinical study reports. *CMAJ*. 2017 Feb 6; 189(5): 194–203.
- [22] .Kulaksizoğlu H, Akand M, Çakmakçi E, Gül M, & Seçkin B. Effectiveness of pelvic floor muscle training on symptoms and uroflowmetry parameters in female patients with overactive bladder. *Turkish Journal of Medical Sciences* 2015; 45: 449-453
- [23] Fariba Ghaderiand Ali E. Oskouei. Physiotherapy for Women with Stress Urinary Incontinence: A Review Article. *J Phys Ther Sci*. 2014 Sep; 26(9): 1493–1499.
- [24] M Ozcan1, S Kapucu. Assessing information on kegel exercises provided to elderly women with urinary incontinence. *Journal of The Indian Academy of Geriatrics*, Vol. 11, No. 4, December, 2015
- [25] Joshi1, A. K. Joshi1, Z. Mohsin. Role of postpartum Kegel exercises in the prevention and cure of stress incontinence. *International Journal of Reproduction, Contraception, Obstetrics and Gynecology*. 2016 Mar;5(3): 669-673
- [26] Abrams P, Cardozo L, Wagg A, Wein A. Incontinence. 6th International Consultation on Incontinence; Tokyo. 2017. Sep, pp. s. 22pp. 87–88.
- [27] Patricia Neumann. Pelvic Floor and Abdominal Muscle Interaction: EMG Activity and Intra-Abdominal Pressure. *International Urogynecology Journal*. 2017; 13(2):125-32
- [28] Laycock J. Clinical evaluation of the pelvic floor. In: Schussler B, Laycock J, Norton PA, Stanton SL, (eds), editors. *Pelvic floor re-education, Principles and Practice*. London: Springer. 1994. p. 42–48
- [29] Uebersax JS, Wyman FF, Shumaker SA, et al. Short forms to assess life quality and symptom distress for urinary incontinence in women: the incontinence impact questionnaire and urogenital distress inventory. *Neurourol Urodyn* 1995; 14: 131.
- [30] El-Azab AS, Mascha EJ: Arabic validation of the Urogenital Distress Inventory and Adapted Incontinence Impact Questionnaires--short forms. *Neurology and Urodynamics*. 2009; 28 (1): 33-39.
- [31] Fitz F, Thaís Fonseca Cost, Deborah Mari Yamamoto, Ana Paula Magalhães Resende, Liliana Stüpp, Marair Gracio Ferreira Sartori, Manoel João Batista Castello Girão, Rodrigo Aquino Castro. Impact of pelvic floor muscle training on the quality of life in women with urinary incontinence. *Rev. Assoc. Med. Bras*. 2012; 58 (2):155 -159
- [32] Sharaf A., El Sebai N., Ewieda M., Shokry M. and Salem M. The Impact of Nursing Interventions on the Control of Urinary Incontinence among Women. *Journal of American Science*. 2010;6(10):1256 -1271.
- [33] Chitra Joshi, Anil Kumar Joshi, Zehra Mohsi. Role of postpartum Kegel exercises in the prevention and cure of stress incontinence. *International Journal of Reproduction, Contraception, Obstetrics and Gynecology*. 2016 Mar; 5(3):669-673
- [34] Marques A., Lynn Stothers, and Andrew Macnab. The status of pelvic floor muscle training for women. *Can Urol Assoc J*. 2018; 4(6): 419–424.

[35] Edibe Pirincci, Ayse Ferdane Oguzoncul & Rabia Tasdemir. Age at the onset of menopause and its influencing factors in Turkish women in a rural area Journal of Women & Aging. 2016; 28 (3): 17–21.

[36] Betschart, Cornelia & Wisser, Josef. The Effect of Pregnancy on the Pelvic Floor: Childbirth Trauma. 2017; 43-56.

[37] Yoonjung kim and Yeunhee kwak. Urinary incontinence in women in relation to occupational status. Journal Women & Health. 2017; 57(1): 1-7.

[38] Agnieszka Radzimińska, Agnieszka Strączyńska, Magdalena Weber-Rajek, Hanna Styczyńska, Katarzyna Strojek, and Zuzanna Piekorz., The impact of pelvic floor muscle training on the quality of life of women with urinary incontinence: a systematic literature review. *Clic interv. Aging*, 2018, May. 13: 957-965.

[39] Finnbogadóttir H. Moghaddassi M and Stenzelius K. Pelvic Floor Muscle exercise after delivery with or without the biofeedback Method: An Intervention Study. *J Women’s Health Care* 2016, 5:2

[40] Marzieh Kargar Jahromi, Malihe Talebizadeh, and Maryam Mirzaei. The Effect of Pelvic Muscle Exercises on Urinary Incontinency and Self-Esteem of Elderly Females With Stress Urinary Incontinency. 2015 Mar; 7(2): 71–79.

[41] Gilmour, Talia Rachel. "Strength Training for Stress Urinary Incontinence in a young, nulliparous female athlete: A case report." (2017). <http://digitalrepository.unm.edu/dpt/132>

[42] Ghafouri A et al. Urinary incontinence in Qatar: A study of the prevalence, risk factors and impact on quality of life, *Arab J Urol*. 2014; 12(4):269-74.

[43] Opara J, Czerwińska W E. The prevalence of stress urinary incontinence in women studying nursing and related quality of life. *Prz Menopauzalny* 2014; 18(1): 32-35

[44] Mohammed S Z, Karmallawy E and Mohamed R A. Assessing quality of life of women with urinary incontinence. *Egyptian Nursing Journal*, 2015; 111 (22): 21-23.

[45] Elbana H. M., Salama, A. M. Barakat M. M. Effect of Urinary Incontinence on Quality of Life and Self Esteem of Postmenopausal Women. *American Journal of Nursing Science*. 2018; 7 (5): 182-191

[46] Cavkaytar S., Kokanali M. K., Topcu H. O., Aksakal O. S. & Doğanay M. Effect of home-based Kegel exercises on quality of life in women with stress and mixed urinary incontinence. *Journal of Obstetrics and Gynecology*, 2014; 2 (1): 1- 4

[47] Hussein M, Mohamed H, El-Nemer A. Pelvic floor muscle training program for Egyptian women with neglected urinary incontinence. *Journal of Nursing Education and Practice*. 2015; 5 (5):92 – 101

APPENDIX-1

Table (1): Distribution of the control and study groups according to their socio- demographic characteristics

Socio-demographic characteristics	Control group N=30 (%)	Study group N=30 (%)	Total N=60 (%)	Pearson Chi-Square Value (P)
Age	13 (43.4)	9 (30.0)	22(36.7)	6.338 (.501)
• 45-50	17 (56.6)	21(70.0)	38(63.3)	
Marital status	25 (83.3)	26 (86.7)	51(85.0)	3.686 (.158)
• Married	2 (6.7)	4 (13.3)	6 (10.0)	
• Widow	3 (10.0)	0	3 (5.0)	
Educational level	3 (10.0)	2 (6.7)	5(8.3)	1.073 (.784)
• Illiterate	4 (13.3)	2 (6.7)	6(10)	
• Read & write	12 (40.0)	13 (43.3)	25(41.7)	
• Secondarylevel	11 (36.7)	13 (43.3)	24(40)	
Total	30 (100%)	30 (100%)	60 (100)	

Table (2): Distribution of the control and study groups according to their reproductive history

Reproductive history	Control group N=30 (%)	Study group N=30 (%)	Total N=60 (%)	Pearson Chi-Square Value (P)
Number of gravid				
• >3	15(50.0)	16(53.3)	31(51.7)	5.992 (.424)
• 3 or more	15(50.0)	14 (46.7)	29(48.3)	
Number of deliveries				
• >3	15(50.0)	16(53.3)	31(51.7)	3.991 (.551)
• 3 or more	15(50.0)	14 (46.7)	29(48.3)	
Nature of previous deliveries				
• Normal vaginal delivery	18 (60.0)	19(63.4)	37 (61.7)	1.080 (.583)
• Vaginal with episiotomy	9 (30.0)	10(33.3)	19 (31.7)	
• Cesarean	3 (10.0)	1(3.3)	4 (6.7)	
Total	30(100%)	30(100%)	60(100%)	

Table (3): Distribution of the control and study groups according to their Work load

Work load	Control group N=30 (%)	Study group N=30 (%)	Total N=60 (%)	Pearson Chi-Square Value (P)
Not working	7 (23.3)	11 (36.7)	18 (30.0)	14.667 (.101)
Work with sitting	6 (20.0)	9 (30.0)	15 (25.0)	
Work with Standing light	6 (20.0)	3 (10.0)	9 (15.0)	
Work with Standing moderate-heavy	5 (16.7)	1 (3.3)	6 (10.0)	
Walking with carrying heavy objects	6 (20.0)	3 (10.0)	9 (15.0)	
Movement with pushing heavy object more than 40kg	0	3 (10.0)	3 (5.0)	
Total	30 (100.0%)	30 (100.0%)	60 (100.0%)	

Table (4): Distribution of control and study groups according to their usual urination pattern

Usual urination pattern	Participants Type		Total	Pearson Chi-Square Value (P)
	Control group	Study group		
Leakage of urine during sexual intercourse				
• Non-applicable [#]	5 (16.7)	4 (13.3)	9 (15.0)	0.8337 (.361)
• Never	0	0	0	
• Sometimes	11(44.0)	14 (56.0)	15 (25.0)	
• Mostly	11(44.0)	8 (32.0)	30 (50.0)	
• Always	3 (12.0)	3 (12.0)	6 (10.0)	
Total	25 (100.0%)	26 (100.0%)	51(100.0%)	
Behavior upon urinary urgency				
• Going immediately to the bathroom	9 (30.0)	3 (10.0)	12(20.0)	4.500 (.105)
• Waiting a little till finishing work	12(40.0)	12(40.0)	24(40.0)	
• Postpone urination for a long period of time	9(30.0)	15(50.0)	24(40.0)	
Total	30(100.0%)	30(100.0%)	60(100.0%)	

Number of waking up for urination at night				7.524 (.111)
• Never	5(16.7)	1(3.3)	6(10.0)	
• Once	12(40.0)	12 (40.0)	24(40.0)	
• Twice	8 (26.7)	13 (43.3)	21(35.0)	
• Three times	2 (6.7)	4 (13.3)	6(10.0)	
• More than three times	3(10.0)	0	3(5.0)	
Total	30(100.0%)	30(100.0%)	60(100.0%)	

Non-applicable (15% of the total subjects were excluded as they were widow or divorced)

Table (5): Distribution of the control and study groups according to Pelvic floor Muscle Strength before and after kegel's exercise (Modified Oxford Grading Scale)

Pelvic floor Muscle Strength	Time of follow up						F (p) between Study & control groups	
	Control group (Routine care) N=30 (%)			Study group (Kegel's Exercise) N=30 (%)				
	Before	After		Before	After		Before (P3)	After (P4)
		6wks.	12 wks		6wks.	12 wks		
- No contraction	3 (10)	3 (10)	3 (10)	0	0	0	F =1.062 (P=0.307)	F=7.739 ** (P=0.000)
- Flicker	3 (10)	3 (10)	3 (10)	7 (23.3)	3 (10.0)	2 (6.7)		
-Weak contraction	9 (30)	9 (30)	9 (30)	20 (66.7)	17 (56.7)	14 (46.7)		
-Moderate contraction	15 (50)	12 (40)	12 (40)	3 (10)	7 (23.3)	9 (30.0)		
- Good contraction	0	3 (10)	3 (10)	0	3 (10)	5 (16.7)		
Mean + SD	2.2±0.8	2.5±0.7	2.6±0.6	2.4±0.7	2.8±0.6	3.2±0.8		
P1(before- after 6wks)	F=2.389 P= (0.128)		F = 4.5636 (P=0.335)					
P2(before- after 12 wks)	F =1.1538. P= (0.886)		F= 16.991 ** (P=.0000)					

FET (P): repeated ANOVA Test

(P1): significant relation bef. and after practice on six weeks for the study and control group

(P2): significant relation bef. and after practice on twelve weeks for the study and control group

(P3): significant relation bef. practice between study and control groups

(P4): significant relation after practice between study and control groups

** **Highly significant** P ≤ 0.000

* **Significant** P ≤ 0.05

Table (6): Number and percent distribution of the control and study groups according to their SUI symptoms before and after Kegel's exercise (UDI-6)

Urinary stress incontinence symptoms	Control group (Routine care) N=30 (%)			Study group (Kegel's Exercise) N=30 (%)		
	Before	After		Before	After	
		6 weeks	12 weeks		6 weeks	12 weeks
- Frequent urination						
• Not at all	0	0	0	0	0	0
• A little bit	0	0	3	0	3	12 (40.0)

• Moderately	23 (76.7)	24 (80.0)	21 (70.0)	22 (73.3)	24 (80.0)	15 (50.0)
• Greatly	7 (23.3)	6 (20.0)	6 (20.0)	8 (26.7)	3 (10.0)	3 (10.0)
- Urine leakage related to the feeling of urgency						
• Not at all	0	0	0	0	0	0
• Mild	9 (30.0)	12 (40.0)	14 (46.7)	0	6 (20.0)	16 (53.3)
• Moderately	15 (50.0)	12 (40.0)	8 (26.7)	18 (60.0)	21 (70.0)	10 (33.3)
• Greatly	6 (20.0)	6 (20.0)	8 (26.7)	12 (40.0)	3 (13.3)	4 (10.0)
- Urine leakage related to physical activity, coughing or sneezing						
• Not at all	0	0	0	0	0	0
• Mild	0	0	0	0	0	3 (10.0)
• Moderately	5 (16.7)	12 (40.0)	14 (46.7)	7 (23.3)	9 (30.0)	19 (63.3)
• Greatly	25 (83.3)	18 (60.0)	16 (53.3)	23 (76.7)	21 (70.0)	8 (26.7)
- Small amounts of urine leakage (that is drops)						
• Not at all	0	0	0	0	0	0
• Mild	3 (10.0)	3 (10.0)	3 (10.0)	0	0	0 (33.3)
• Moderately	2 (6.7)	13 (43.3)	9 (30.0)	1 (3.3)	17 (56.7)	21 (70.0)
• Greatly	25 (83.3)	14 (46.7)	18 (60.0)	29 (96.7)	13 (43.3)	9 (30.0)
- Difficulty emptying bladder						
• Not at all	5 (16.7)	3 (10.0)	3 (10.0)	1 (3.3)	0	3 (10.0)
• Mild	2 (6.7)	5 (16.7)	8 (26.7)	1 (3.3)	7 (23.3)	19 (63.3)
• Moderately	18 (60.0)	18 (60.0)	13 (43.3)	24 (80.0)	21 (70.0)	5 (16.7)
• Greatly	5 (16.7)	4 (13.3)	6 (20.0)	4 (13.3)	2 (10.0)	3 (6.7)
- Pain or discomfort in the lower abdominal or genital area						
• Not at all	3 (10.0)	3 (10.0)	3 (10.0)	0	3 (10.0)	15 (50.0)
• Mild	2 (6.7)	8 (26.7)	11 (36.7)	1 (3.3)	13 (43.3)	7 (23.3)
• Moderately	11 (36.7)	13 (43.3)	10 (33.3)	22 (73.3)	11 (36.7)	5 (16.7)
• Greatly	14 (46.7)	6 (20.0)	6 (20.0)	7 (23.3)	3 (10.0)	3 (10.0)

Table (7): Distribution of the control and study groups according to their total score of SUI symptoms before and after Kegel's exercise UDI-6

Total score of urinary stress incontinence' Symptoms	Time of follow up						F (p) between Study & control groups	
	Control group Routine care)(N=30 (%)			Study group (Kegel's Exercise) N=30 (%)				
	Before	After		Before	After		Before (P3)	After (P4)
		6 weeks	12 weeks		6 weeks	12 weeks		
Moderate impairment	3 (10)	3 (10)	3 (10)	0	6 (20)	10 (33.3)	F=3.405 (P=0.070)	F=36.5 **(P=0.000)
Substantial impairment	6(20)	6(20)	6(20)	9 (30)	10 (33.3)	6 (20)		
Severe impairment	21(70)	21(70)	21(70)	21 (70)	14 (46.7)	14 (46.7)		
Mean ± SD	13.5±2.9	12.4±3.4	12.3±3.6	14.6±1.5	12.3±2.2	9.9±2.6		
P1 (before- after 6wks)	F=1.818 (P=0.183)			F=22.384 (P=0.000)**				
P2 (before- after 12wks)	F =2.022(P=0.160)			F = 14.897 (P=0.000)**				

FET (P): repeated ANOVA Test

(P1): significant relation before and after practice on six weeks for the study and control group

(P2): significant relation before and after practice on twelve weeks for the study and control group

(P3): significant test before practice between study and control groups

(P4): significant test after practice between study and control groups

** Highly significant $P \leq 0.000$

* Significant $P \leq 0.05$

Table (8): Distribution of the control and study groups according to their SUI impact on Quality of Life before and after Kegel's exercise (IIQ-7)

Quality of Life	Control group (Routine care) N=30 (%)			Study group (Kegel's Exercise) N=30 (%)		
	Before	After		Before	After	
		6 weeks	12 weeks		6 weeks	12 weeks
Prayer						
• Not at all	0	0	0	0	0	0
• Makes me repeat the ritual cleansing	8 (26.7)	8 (26.7)	8 (26.7)	1 (3.3)	1 (3.3)	10 (33.3)
• Makes me repeat the prayer	16 (53.3)	18 (60.0)	18 (60.0)	14 (46.7)	18 (60.0)	18 (60.0)
• Almost makes me stop praying.	6 (20.0)	4 (13.3)	4 (13.3)	15 (50.0)	11 (36.7)	2 (6.7)
Ability to do household chores (cooking, housecleaning and/or laundry)						
• Not at all	0	0	0	0	0	0
• Infrequently	3 (10.0)	6 (20.0)	8 (26.7)	0	6 (20.0)	13 (43.3)
• Frequently	22 (73.3)	16 (53.3)	14 (46.7)	23 (76.7)	23 (76.7)	16 (53.3)
• Almost always	5 (16.7)	8 (26.7)	8 (26.7)	7 (23.3)	1 (3.3)	1 (3.3)
Physical recreation such as walking, swimming and/or other exercise						
• Not at all	0	0	0	0	0	0
• Infrequently	0	12 (40.0)	8 (26.7)	0	7 (23.3)	13 (43.3)
• Frequently	22 (73.3)	15 (50.0)	11(36.7)	11 (36.7)	18 (60.0)	13 (43.3)
• Almost always	8 (26.7)	13 (43.3)	11 (36.7)	19 (63.3)	5 (16.7)	4(13.3)
Ability to travel by car or bus more than 30 minutes from home						
• Not at all	0	0	0	0	0	0
• Infrequently	0	0	0	0	3 (10.0)	6 (20.0)
• Frequently	15 (50.0)	14 (46.7)	12 (40.0)	3 (10.0)	10 (33.3)	18 (60.0)
• Almost always	15 (50.0)	16 (53.3)	18 (60.0)	27 (90.0)	17 (56.7)	6 (20.0)
Participation in social activities outside home						
• Not at all	0	0	0	0	0	0
• Infrequently	2 (6.7)	4 (13.3)	10 (33.3)	1 (3.3)	2 (6.7)	14 (46.7)
• Frequently	16 (53.3)	15 (50.0)	6 (20.0)	20 (66.7)	24 (80.0)	12 (40.0)
• Almost always	12 (40.0)	11 (36.7)	14 (46.7)	9 (30.0)	4 (13.3)	4 (13.3)
Emotional health disturbances such as nervousness, and/or depression						
• Not at all	0	0	0	0	0	0
• Infrequently	3 (10.0)	6 (20.0)	12 (40.0)	0	6 (20.0)	18 (60.0)
• Frequently	17 (56.7)	14 (46.7)	6 (20.0)	10 (33.3)	19 (63.3)	6 (20.0)
• Almost always	10 (33.3)	10 (33.3)	12 (40.0)	20 (66.7)	5 (16.7)	6 (20.0)
Feeling frustrated						
• Not at all	3 (10.0)	3 (10.0)	3 (10.0)	0	0	0
• Infrequently	0	2 (6.7)	5 (16.7)	0	10 (33.3)	18 (60.0)
• Frequently	13 (43.3)	10 (33.3)	8 (26.7)	8 (26.7)	14 (46.7)	5 (16.7)
• Almost always	14 (46.7)	15 (50.0)	14 (46.7)	22 (73.3)	6 (20.0)	7 (23.3)

Table (9): Distribution of the control and study groups according to their total score of SUI impact on Quality of Life before and after kegel's exercise (IIQ-7)

Quality of Life disturbance	Time of follow up						F (p) between Study & control groups			
	Control group (Routine Care) N=30 (%)			Study group (Kegel's Exercise) N=30 (%)						
	Before	After		Before	After		Before (P3)	After (P4)		
		6 weeks	12 weeks		6 weeks	12 weeks				
Moderate disturbance	0	0	0	0	3 (10)	3 (10)			F=0.199 (P=0.657)	F=73.4 ** (P=0.00)
Substantial disturbance	3 (10)	6(20)	6(20)	9 (30)	11 (70)	15 (50)				
Severe disturbance	27(90)	24(80)	24(80)	21 (70)	16 (53.3)	12 (40.0)				
Mean ± SD	74.2±8.7	72.5±13.5	69.3±18.6	75.1 ±6.8	68.8±10.1	56.7±16.2				
P1(before - after 6week)	F=.0336 (P=0.564)			F=8.032 (P=0.006)						
P2(before - after 12 week)	F =1.708 (P=0.196)			F =32.904 (P=0.000)						

FET (P): repeated ANOVA Test

(P1): significant relation before and after practice on six weeks for the study and control group

(P2): significant relation before and after practice on twelve weeks for the study and control group

(P3): significant test before practice between study and control groups

(P4): significant test after practice between study and control groups

** Highly significant $P \leq 0.000$

* Significant $P \leq 0.05$