

EFFECT OF INTERFERENTIAL THERAPY VERSUS KEGEL  
EXERCISES WITH URINARY INCONTINENCE ON POST  
MENOPAUSAL WOMEN

**A Dissertation Submitted to  
Department of physiotherapy  
In partial fulfillment of the requirements for  
the Award of the degree of  
Master of physiotherapy in Obstetrics and Gynecology**

Supervised by:

Dr. Manpreet Kaur Kang

MSPT (Lecturer)

Submitted by:

Rimzim Gupta



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**U** NIVERSITY

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Punjab

May 2015

## **CERTIFICATE**

This is to certify that the dissertation work entitled “**effect of interferential therapy versus kegel exercises with urinary incontinence on post-menopausal women**” was carried out by **Rimzim Gupta, Registration No. 11301636**, Department of Physiotherapy, Lovely Professional University, towards partial fulfillment of the requirements of Masters of Physiotherapy (OBG) degree program.

**Dr. Jasobanta Sethi, MPT, PhD, FIAP**

Professor and Head,

Department of Physiotherapy,

Lovely Professional University

Phagwara- 144402

Date:

Place:

## **CERTIFICATE**

This is to certify that **Miss. Rimzim Gupta, Registration No- 11301636** has completed MPT dissertation titled "EFFECT OF INTERFERENTIAL THERAPY VERSUS KEGEL EXERCISES WITH URINARY INCONTINENCE ON POST MENOPAUSAL WOMEN" under my guidance and supervision. To the best of my knowledge, the present work is the result of his original investigation and study. No part of this dissertation has been submitted for any other degree or diploma.

The dissertation is fit for the submission and partial fulfillment of the conditions for the award of **MPT-OBG**

**Date:**

**Place:**

**Signature of Supervisor**

**Dr. Manpreet Kaur Kang**

**Specialisation: MSPT**

**Designation: Lecturer**

**Department of Physiotherapy**

**Lovely Professional University**

**Phagwara, Punjab.**

## DECLARATION

I hereby declare that the dissertation entitled," EFFECT OF INTERFERENTIAL THERAPY VERSUS KEGEL EXERCISES WITH URINARY INCONTINENCE ON POST MENOPAUSAL WOMEN" submitted for the MPT-OBG degree is entirely my original work and all ideas and references have been duly acknowledged. It does not contain any work for the award of any other degree or diploma.

This thesis encompasses the information generated by me based on experiments work carried out in the institute. I ensure and hold full responsibility for its genuines.

Date:  
Place:

Investigator  
**Rimzim Gupta**  
Registration No-11301636

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Rimzim Gupta

**Dedicated**

**To**

**Parents**

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Urinary incontinence is recurrent health problem in the female population causing hindrances to routine activity and value of life <sup>(1)</sup>. About 25% of the women between 15 and 64 years old and more than 50% of those attended to geriatric clinics are incontinent<sup>(2)</sup>. The typical form of Incontinence is stress urinary incontinence<sup>(3)</sup>. This is caused when there is sudden increase in the intra-abdominal pressure due to physical activity such as sneezing, coughing or lifting<sup>(4)</sup>.

Though Urinary incontinence is not a dangerous problem but, it is a disease that involves all categories of females and lead to many medical and social issues. The condition is not only hampering the female personal life but also of economic value<sup>(5)</sup>.

There are various hormones that are required for the development of the female characteristics. Estrogen helps to maintain the elasticity and strength of the pelvic floor muscles that provides greater control over the bladder and bowel function <sup>(6)</sup>.

Stress urinary incontinence is due to the loss of tensile strength between the tissues from the decreasing levels in the pre (before) and post (after) menopausal years of life.

Any pelvic floor injury due to multiple or traumatic vaginal deliveries contributes higher rates of stress urinary incontinence in menopause <sup>(7)</sup>.

The average life expectancy of females in India has approached 67 years , hence the problems of menopause have attained a greater significance .With in a geographical region , there are ethnic differences in menopausal symptoms .There was a study which found that Indian females are reaching menopause as early as at the age of 30 called as premature menopause.Early menopause may be a factor causing increased rates of mortality due to diminished levels of estrogen and may promote increased incidence for osteoporosis, heart diseases, diabetes, hypertension and breast cancer <sup>(8)</sup>.

Menopause is the permanent stoppage of menstrual cycles at the end of the fertile years of the female due to loss of the ovarian follicular activity.

The period of time when women passes from reproductive stage to the non-reproductive stage is termed as Climacteric. This period of time almost covers 5=10years on either sides of menopause. Perimenopause is that phase of the climacteric when the periods are irregular. Post menopause is that stage that comes after the Menopause. The age of the menopause varies between 45-55 years, but the average age being 50 years <sup>(7)</sup>.

Many changes can occur in the body of the female due to the changes occurring in the hormonal patterns that starts begin during the menopausal transition. The common signs and symptoms of the climacteric phase are hot flushes, mood swings, and lack of interest in sexual activity and dryness of the vagina <sup>(9)</sup>.

Most of the symptoms that occur during menopause are likely to disappear at some point of time but some like vaginal dryness may be an ongoing problem. There are also other health issues important to know about women occurring during this phase are Osteoporosis, Cardiovascular disease and Urinary incontinence.

Menopause can take toll on heart. It is actually the result of the cortisol. The sneaky hormone acts with the estrogen in a way that can damage the heart. Cortisol and estrogen has complex relationship in which estrogen controls the production of cortisol. When estrogen gets depleted, the cortisol levels rise to extremely high levels during stress full moments. Some women seek medical attention for their climacteric symptoms, but others either tolerate the changes or don't even experience the symptoms severe enough to seek medical treatment <sup>(10)</sup>.

'Electrical Stimulation' is mainly used to treat urinary leakage problem in women. It is a therapeutic intervention given to patients with 'urinary incontinence' that includes the 'Suprapubic', 'Transvaginal' 'Sacral and tibial nerves stimulation' <sup>(11)</sup>.

Restoration of urinary Incontinence is possible after electrical stimulation of different modalities (Fal, 1984; Mantle and Versi, 1991 and Sand et al; 1995). The most popular form of treatment is the Interferential therapy where two slightly different medium frequency either in the range of 4000Hz (4KHZ) or 2000Hz (2KHz) are being constantly required for curing the symptoms of urinary leakage. The medium frequency currents are arranged cross-firily that interferes with one another to produce a low frequency current that is equal to the difference between the two initial frequencies i.e., 100Hz <sup>(12)</sup>.

There are various subjective evidences that support the logical hypothesis that the longer pulse width (0.25 milliseconds) of carrier wave in the region 2000 Hz will be more effective than the (0.125 milliseconds) of the 4000 Hz carrier wave. It is generally explained that muscular urethral pressure is most effectively achieved with a pulse duration of 0.1=1.0 milliseconds <sup>(13)</sup>.

Treatment times varies according to the type of the condition whether acute or chronic .In acute conditions duration of 5-10 minutes is sufficient to reach the desired effect .In chronic conditions 20-30 minutes of treatment is required to stimulate the tissues .

Interferential therapy is effective in the stimulation of deeper bodily structures because Interferential therapy current is able to penetrate deep enough to reach the pelvic floor <sup>(14)</sup>.

‘Pelvic floor exercises’ that continuously contract and relax the muscles which form the bulk of the pelvic area, commonly known as ‘Kegal muscles’. These were first given by Arnold Kegal in 1948 which is used to reduce urinary incontinence. The action of continuously slowing or stopping the flow of urine is used as a correct method for checking the pelvic floor integrity. It is generally said that the components of the ‘pelvic diaphragm’, namely ‘pubococcygeus’, ‘puborectalis’ and ‘iliococcygeus’, contract and relax as one set of muscles <sup>(15)</sup>.

The purpose of the ‘pelvic floor’or ‘kegel muscle’ exercise is to increase the muscle volume. The hypertrophy of the muscles of the pelvis leads to maximum ‘urethral closure pressure’and there might be stronger contractions which increases the ‘intra abdominal pressure’. The neck of the bladder is well backed up by the set of pelvic muscles that lowers the movement of the urethra during any straining activity and lessens the urinary outflow <sup>(16)</sup>.

The pelvic group of muscles can be triggered along with the muscles of the abdomen.

. There is affirmation which suggests that the active contraction of the transverse abdominis muscle is well coordinated bythe co contraction of the pelvic floor muscle. The relation between the abdomen musles and kegel muscles are different among the straining and the non-straining though the pelvic floor muscles are less moved during the time of abdominals contraction in females with urinary dysfunction as compared to non straining women..

The vaginal cones are commonly used for the strengthening of the pelvic floor muscles can be used .The weight and the size of the cones may vaies from 20 to 150 gm <sup>(17)</sup>.

Kegel who introduced the concept of increasing the strength of the pelvic group of muscles in urine leakage, gave more emphasis on the muscle re-training in order to gain the awareness of the functioning of muscles. The high incidence of urine outflow and its

influence on the value of life, this condition should be treated in the primary care rather than the specialist referral.

There will be loss of urethral closure pressure that is because of age related deterioration of the urethral musculature as well as from neurologic injury. The normal function of the urethral support system requires the contractions of the levator ani muscle which provide support to the urethra through endopelvic fascia. During a cough reflex, there will be simultaneously contraction of the levator ani muscle along with the diaphragm and abdominal muscles to build the abdominal pressure<sup>(18)</sup>.

The relationship between the different muscles and their fascias are broken only ,when the normal function of the ‘levator ani’ while doing cough. .Age is considered as a important parameter in prevalence, stress urinary incontinence mainly occurs in perimenopausal and young women but mixed incontinence found to be increase beyond the menopausal years and became the most existing type of urinary incontinence<sup>(19)</sup>.

Women experience urinary incontinence much more than the male population.. ‘Pregnancy’ and ‘child birth’ ‘Menopause’ , and the normal alignment of urinary tract deals with this condition .Incontinence generally occurs when the bladder muscles suddenly contract or the sphincter muscles that are not strong enough to hold back urine .Obesity associated with increased abdominal pressure can deteriorate the incontinence

Regular exercise benefits the heart and bones that helps in regulating the weight and a sense of overall well-being and improves the various mood fluctuations occurring during menopausal years. There are various studies who demonstrated that the women performing muscle strength training reduced the risk of cardiovascular disease and cancer<sup>(9)</sup>.

Thus, considering the limited options available in clinical practice for the management of post-menopausal symptoms it has been an important initiative on the part of the Indian Menopausal Society to revisit the subject and have a holistic approach to clinical practice Guidelines on Menopause.

## **1.2 Need of Study**

Urinary Incontinence is on going gynecological condition, one of the causes which are interfering with the social and professional life of post-menopausal female. As no one such

study has been conducted earlier to compare interferential therapy and Kegel exercises in Post-Menopausal women.

### **1.3 Significance of Study**

This study will provide a new insight to the clinician and patients community regarding the best possible treatment for 'urinary Incontinence' in 'Post-Menopausal women and last but not the least, this treatment approach is inexpensive, noninvasive and outpatient technique which provide convenience to the patients. Moreover, it will also help in improving the social and professional life of these females.

### **1.4 Aims and Objectives**

- 1) To determine the effect of interferential therapy in urinary Incontinence of Post-Menopausal women.
- 2) To determine the effect of Kegel exercises in urinary incontinence of Post-Menopausal women.
- 3) To evaluate the effect of interferential therapy versus Kegel exercises in urinary Incontinence of Post-Menopausal women.

### **1.5 Hypothesis**

#### **Alternate Hypothesis (H1)**

There is difference between the effectiveness of Interferential therapy (IFT) and Kegel exercises in treating urinary Incontinence in Post-Menopausal women.

#### **Null Hypothesis (H0)**

There is no difference between the effectiveness of Interferential therapy (IFT) and Kegel exercises in treating urinary Incontinence in Post-Menopausal women

### **1.6 Operational Definitions**

- **Genuine stress incontinence:** It is the type of urinary incontinence which occurs due to sudden increase in the intra- abdominal pressure such as coughing, sneezing and lifting heavy objects.
- **Post Menopause:** It is the complete cessation of monthly cycles. The symptoms of this condition are: hot flushes, mood swings and urinary problems.
- **Kegel exercises:** These are the group of exercises which are usually performed to reduce urinary incontinence. These are also known as pelvic floor muscle strengthening exercises.

## 4. DATA ANALYSIS AND RESULT

**Table 4.1: Comparison of mean, SD of age between Interferential Therapy Group and Kegel Exercise Group:**

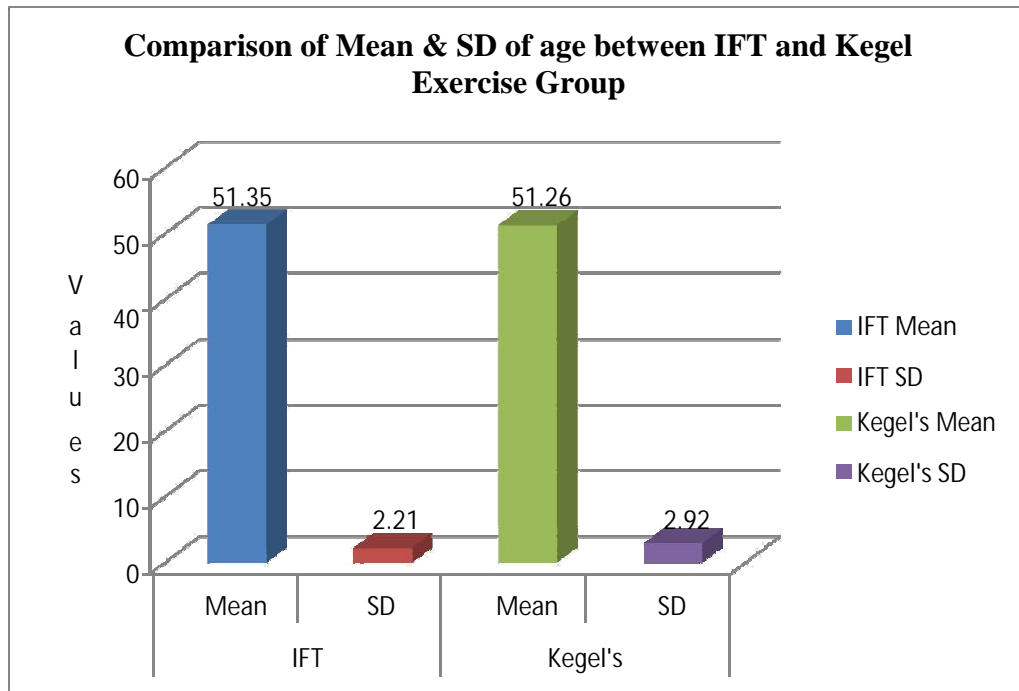
SN	Parameter	Interferential	Kegel Exercise	't' value	p-value
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		Therapy Group		Group			
		Mean	SD	Mean	SD		
1	Age						
		51.35	2.21	51.26	2.92	0.1051	0.91 NS

NS= Non significant

Table 4.1 shows the comparison of mean, SD of age between Interferential Therapy Group and the Kegel Exercise Group. The mean duration was 51.35 & 51.26 between the Interferential Therapy Group and the Kegel Exercise Group. The “t” value was 0.1051 which was less than tabulated value and the p-value was 0.91. Thus there was no significant difference between the age of patients in between Interferential Therapy Group and Kegel Exercise Group. The statistical significance level was  $p < 0.05$ .





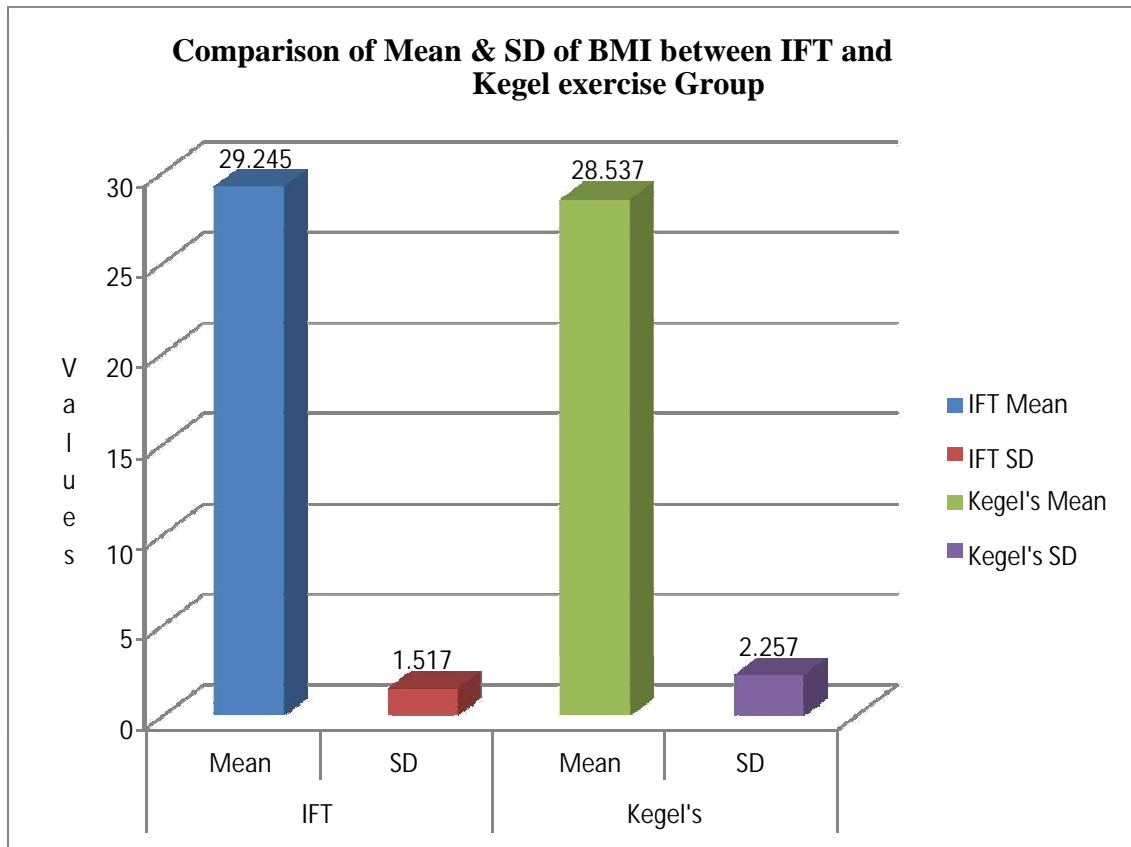
**Graph 1: Comparison of mean, SD of age between Interferential Therapy Group and Kegel Exercise Group.**

**Table 4.2: Comparison of mean, SD of BMI between Interferential Therapy Group and Kegel Exercise Group:**

SN	Parameter	Interferential Therapy Group		Kegel Exercise Group		‘t’ value	p-value
		Mean	SD	Mean	SD		
1	Age					1.1553	0.25 NS
		29.24	1.517	28.53	2.257		

NS= Non significant

Table 4.2 shows the comparison of mean, SD of BMI between Interferential Therapy Group and the Kegel Exercise Group. The mean duration was 29.24 & 28.53 between the Interferential Therapy Group and the Kegel Exercise Group. The “t” value was 1.1553 which was less than tabulated value and the p-value was 0.25. Thus there was no significant difference between the BMI of patients in between Interferential Therapy Group and Kegel Exercise Group. The statistical significance level was  $p < 0.05$ .

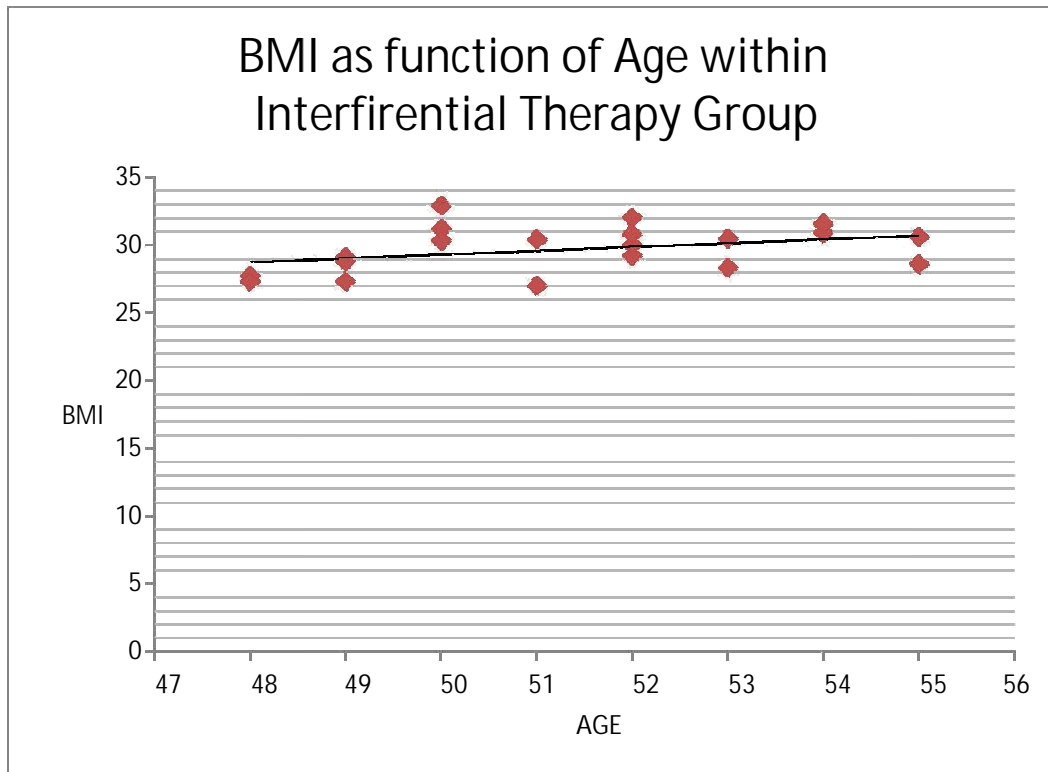


**Graph 2: Comparison of mean, SD of BMI between Interferential Therapy Group and Kegel Exercise Group**

**Table 4 3: Value of Pearson correlation coefficient of Age and BMI of the subjects for the Interferential Therapy Group.**

<b>Group A</b>	<b>Mean <math>\pm</math> SD</b>	<b>r- value</b>	<b>p-value</b>
AGE	51.35 $\pm$ 2.21	0.623	0.003 Positive Correlation
BMI	29.24 $\pm$ 1.517		

Table 4.3 shows Pearson correlation coefficient of Age and BMI of Interferential Therapy Group. The mean, SD Age of Interferential Therapy Group was 51.35  $\pm$  2.21 and mean, SD BMI of Interferential Therapy Group was 29.24  $\pm$  1.517 respectively. The r value was 0.623 and p-value was 0.003. There was positive correlation coefficient of age and BMI of the subjects for Interferential Therapy Group.

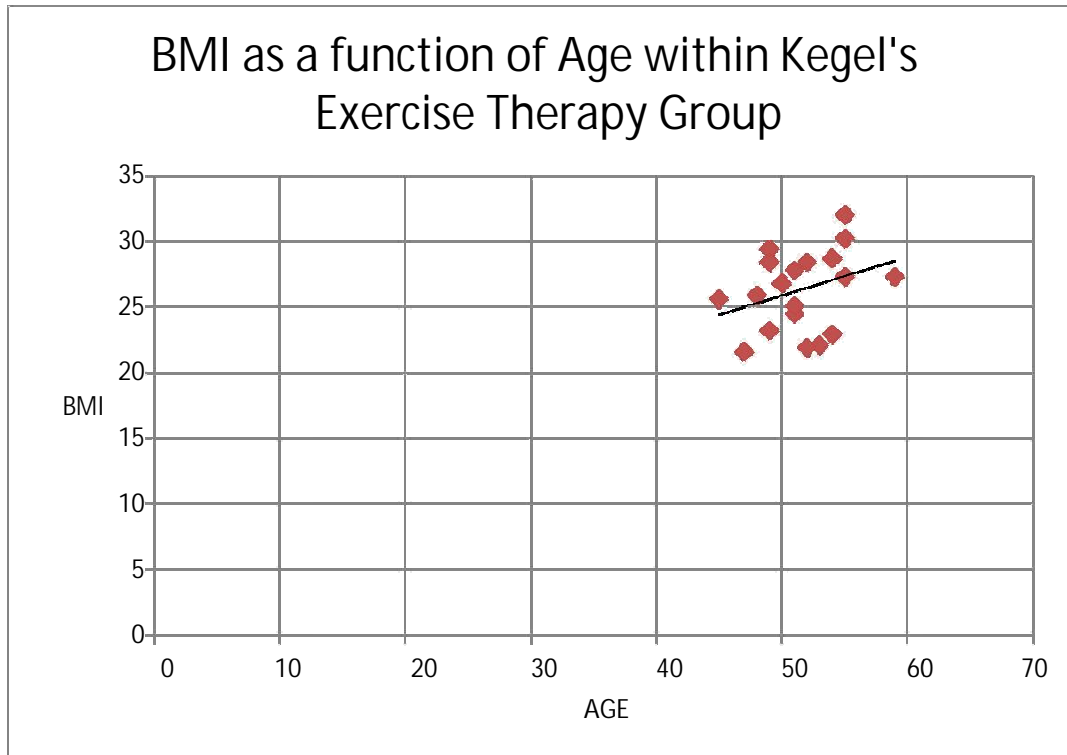


**Graph 3: BMI as a function of Age within Interferential Therapy Group.**

**Table 4 4: Value of Pearson correlation coefficient of Age and BMI of the subjects for the Kegel Exercise Therapy Group.**

<b>Group B</b>	<b>Mean <math>\pm</math> SD</b>	<b>r- value</b>	<b>p-value</b>
AGE	51.26 $\pm$ 2.92	0.924	0.000 Positive Correlation
BMI	28.53 $\pm$ 2.257		

Table 4.4 shows Pearson correlation coefficient of Age and BMI of Kegel Exercise Therapy Group. The mean, SD Age of Kegel Exercise Therapy Group was 51.26  $\pm$  2.92 and mean, SD BMI of Kegel Exercise Therapy Group was 28.53  $\pm$  2.257 respectively. The r value was 0.924 and p-value was 0.000. There was positive correlation coefficient of age and BMI of the subjects for Kegel Exercise Therapy Group.



**Graph 4: BMI as a function of Age within Kegel Exercise Therapy Group.**

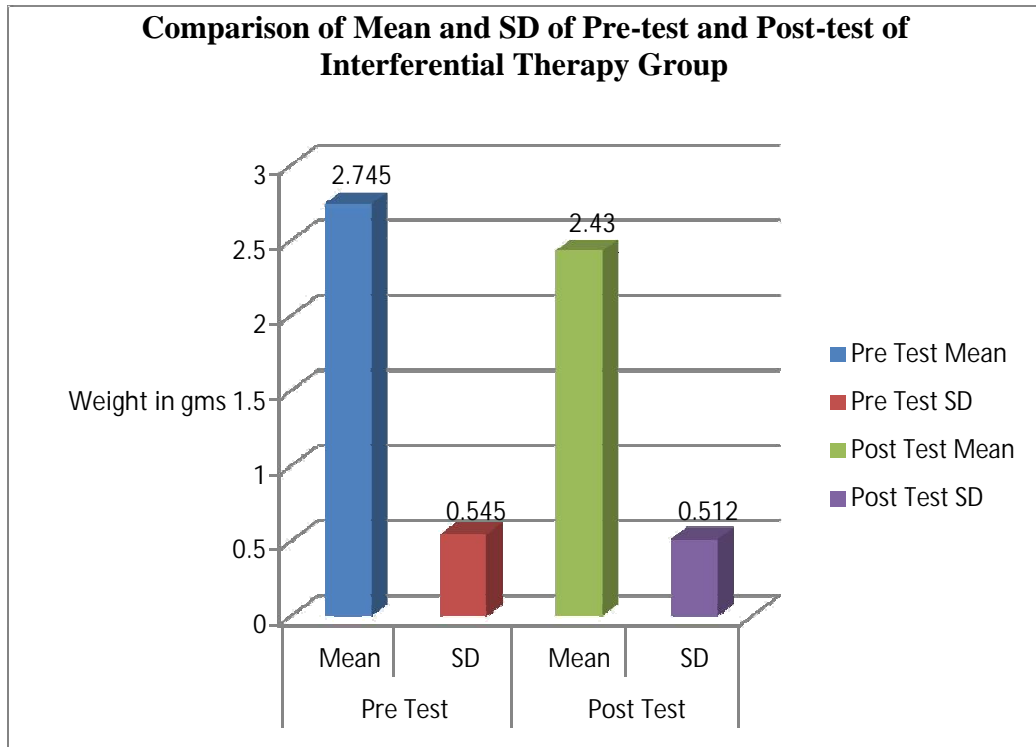
**Table 4.5: Comparison of Mean and SD of Pre-test and Post-test of Interferential Therapy Group by using Paired t-test:**

<b>Group A</b>	<b>Mean <math>\pm</math> SD</b>	<b>t- value</b>	<b>p-value</b>
Pre-Test	2.74 $\pm$ 0.54	9.643	0.000 S
Post-Test	2.43 $\pm$ 0.51		

S= Significant Difference

Table 4.5 shows the comparison of mean, SD of Pre-test and Post-Test of Interferential Therapy Group. The mean duration of Pre-Test and Post-Test was 2.74 & 2.43 respectively for Interferential Therapy Group. The “t” value was 9.643 and the p-value was 0.000. Thus there was significant difference between Pre-test and Post-Test in Interferential Therapy Group. The statistical significance level was  $p < 0.05$ .





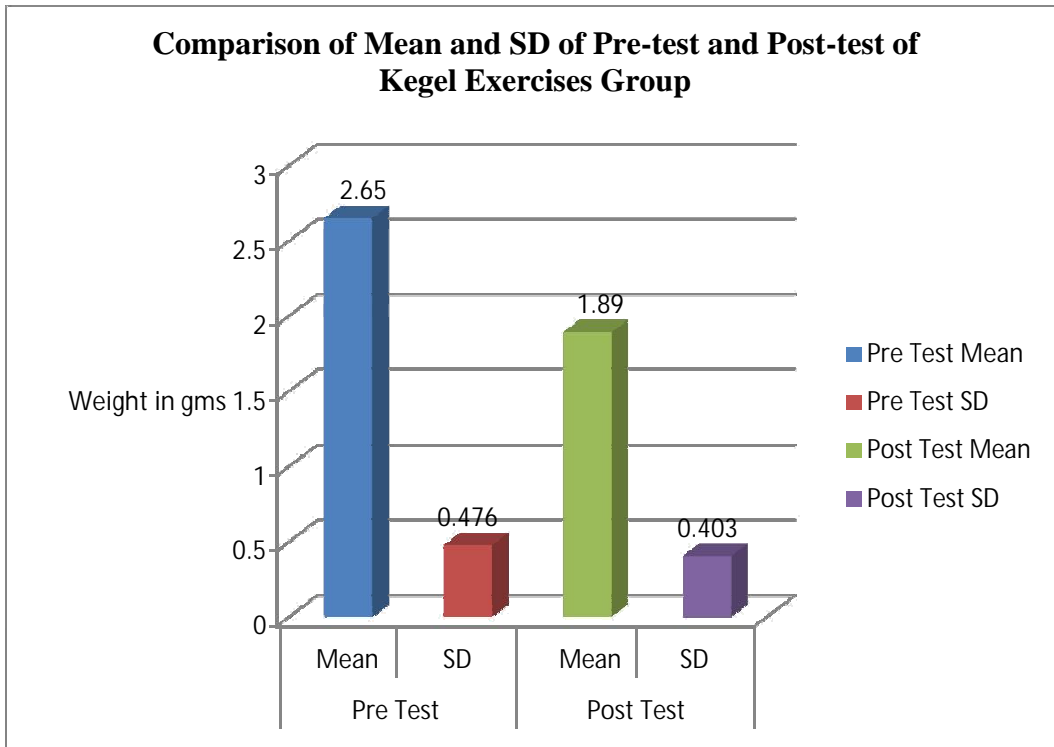
**Graph 5: Comparison of Mean and SD of Pre-test and Post-test of Interferential Therapy Group.**

**Table 4.6: Comparison of Mean and SD of Pre-test and Post-test of Kegel Exercises Group by using Paired t-test:**

<b>Group A</b>	<b>Mean <math>\pm</math> SD</b>	<b>t- value</b>	<b>p-value</b>
Pre-Test	2.65 $\pm$ 0.476	8.121	0.000 S
Post-Test	1.89 $\pm$ 0.403		

S= Significant Difference

Table 4.6 shows the comparison of mean, SD of Pre-test and Post-Test of Kegel Exercises Group by using Paired t-test. The mean duration of Pre-Test and Post-Test was 2.65 & 1.89 respectively for Kegel Exercise Group. The “t” value was 8.121 and the p-value was 0.000. Thus there was significant difference between Pre-test and Post-Test in Kegel Exercise Group. The statistical significance level was  $p < 0.05$ .



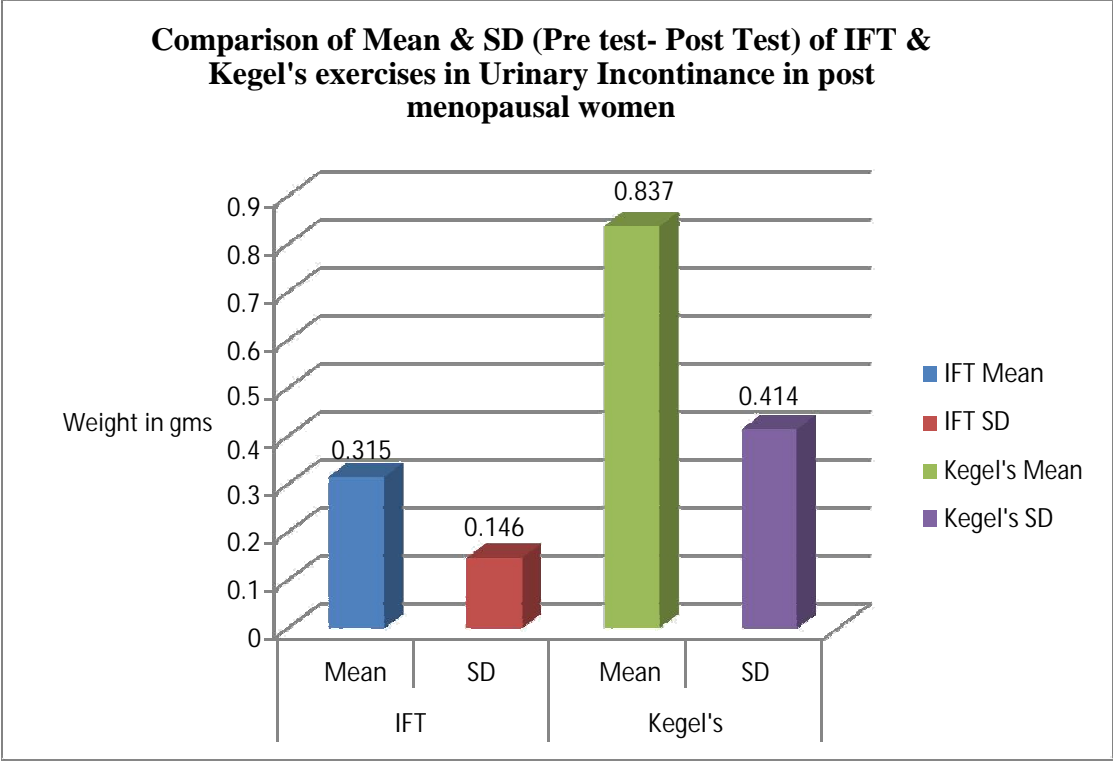
**Graph 6: Comparison of Mean and SD of Pre-test and Post-test of Kegel Exercises Group.**

**Table 4.7: Comparison of Mean and SD of difference between Pre-test and Post-test of Interferential therapy group and Kegel Exercise Group by using Unpaired t-test:**

	Mean $\pm$ SD	t- value	p-value
IFT group	0.315 $\pm$ 0.146	5.3040	0.0001 S
Kegel Exercise Group	0.837 $\pm$ 0.414		

S= Significant Difference

Table 4.7 shows the comparison of mean, SD of difference between Pre-test and Post-Test of Interferential Therapy Group and Kegel Exercise Group by using Unpaired t-test. The mean duration of Interferential therapy group and Kegel Exercise group was 0.315 & 0.837 respectively. The “t” value was 5.3040 and the p-value was 0.0001. Thus there was significant difference between the improvement in Interferential Therapy Group and Kegel Exercise Group. The statistical significance level was  $p < 0.05$ .



**Graph 7: Comparison of Mean & SD (Pretest- Posttest) of IFT & Kegel exercises in Urinary Incontinence in post-menopausal women**

## RESULT

**Table 4.1.** Comparison of mean, SD of age between Interferential Therapy Group and Kegel Exercise Group. The mean age of Interferential therapy group was  $51.35 \pm 2.21$  and that of Kegel exercises was  $51.26 \pm 2.92$ . The Significance value of unpaired t-test value was 0.91 ( $p > 0.05$ ). There was no significant difference in the age group.

**Table 4.2.** Comparison of mean, SD of BMI between Interferential Therapy Group and Kegel Exercise Group. The mean BMI of Interferential therapy group was  $29.24 \pm 1.51$  and that of Kegel exercises was  $28.53 \pm 2.25$ . The Significance level of unpaired t-test value was 0.255 ( $p > 0.05$ ). There was no significant difference in the BMI of both the groups.

**Table 4.3.** Value of Pearson correlation coefficient of Age and BMI of the subjects for the Interferential Therapy Group. The mean, SD Age of Interferential Therapy Group was  $51.35 \pm 2.21$  and mean, SD BMI of Interferential Therapy Group was  $29.24 \pm 1.517$  respectively. The r value was 0.623 and p-value was 0.003. There was positive correlation coefficient of age and BMI of the subjects for Interferential Therapy Group.

**Table 4.4.** Value of Pearson correlation coefficient of Age and BMI of the subjects for the Kegel Exercise Therapy Group. The mean, SD Age of Kegel Exercise Therapy Group was  $51.26 \pm 2.92$  and mean, SD BMI of Kegel Exercise Therapy Group was  $28.53 \pm 2.257$  respectively. The r value was 0.924 and p-value was 0.000. There was positive correlation coefficient of age and BMI of the subjects for Kegel Exercise Therapy Group.

**Table 4.5.** Comparison of Mean and SD of Pre-test and Post-test of Interferential Therapy Group by using Paired t-test. The mean duration of Pre-Test and Post-Test was 2.74 & 2.43 respectively for Interferential Therapy Group. The “t” value was 9.643 and the p-value was 0.000. Thus there was significant difference between Pre-test and Post-Test in Interferential Therapy Group. The statistical significance level was  $p < 0.05$ .

**Table 4.6.** Comparison of Mean and SD of Pre-test and Post-test of Kegel Exercises Group by using Paired t-test. The mean duration of Pre-Test and Post-Test was 2.65 & 1.89

respectively for Kegel Exercise Group. The “t” value was 8.121 and the p-value was 0.000. Thus there was significant difference between Pre-test and Post-Test in Kegel Exercise Group. The statistical significance level was  $p < 0.05$ .

**Table 4.7.** Comparison of Mean and SD of difference between Pre-test and Post-test of Interferential therapy group and Kegel Exercise Group by using Unpaired t-test. The mean duration of Interferential therapy group and Kegel Exercise group was 0.315 & 0.837 respectively. The “t” value was 5.3040 and the p-value was 0.0001. Thus there was significant difference between the improvement in Interferential Therapy Group and Kegel Exercise Group. The statistical significance level was  $p < 0.05$ .

## DISCUSSION

The present study consisted of 40 post-menopausal women in which leakage of urine was assessed through subjective measures i.e., pad test. It is an experimental study done for 6 weeks in which one group consisting of 20 subjects were given Interferential therapy and another group with 20 subjects were administered with Kegel exercises.

Urinary incontinence is one of the existing that causes obstacles in the routinely activities and value of life. It is considered to a stressful condition for the females to cope up with the social outcomes.<sup>1</sup>

The current study revealed that the Kegel exercises are more effective in reducing urinary incontinence than inferential therapy. The stress incontinence mechanism or process contains not only the pelvic group of muscles along with the sphincter closing process that consist of 'urethral striated muscle', 'smooth muscle' and the rest part of the bladder system. The purpose of the 'pelvic floor exercises' in 'stress urinary incontinence' is to gain self control continence using the striated muscle of the pelvic floor.

Women having problem during straining due to stress are caused by periurethral bundles of the 'levator ani muscles' as important process during straining The ' levator ani muscle' is the muscle which when strengthened increases the cross-sectional area which improves the neuromuscular function that ultimately results in the increased number of activated motor neurons that has led to improve the muscle tone.<sup>(11)</sup>

The kegel muscles are the intra-muscular bony tissue that contains estrogen and progesterone receivers. Highly deteriorative changes in 'levator ani' were seen in 'post-menopausal' in contrast to 'pre-menopausal women' having incontinence.<sup>(40)</sup>

Results of our study are in agreement with 'Delancy', who documented how the relaxation and contraction in the 'pelvic floor muscles' are in coordination with visceral neck opening and closure of urethra. The group of exercise will promote physiologic reflex contraction of the pubococcygal part of the levator muscle. There are some biochemical researches on the pelvic floor in females having increased urine outflow.<sup>(4)</sup>

The various considerations regarding the pathophysiology of the pelvic floor muscles indicate that the target for increasing the strength of the muscles of 'pelvic



floor' contains 'Type 2 B fibers' of the 'puborectalis muscle'. The fibers are well suited for the twitches and strong movements which is needed for the 'reflex occlusion of the urethra' at the time of putting pressure and for the voluntary control of urine.<sup>(41)</sup>

Other Authors Van-Brumen et al reported that stress urinary incontinence develops during the child birth following years and that type of female population who delivered vaginally.<sup>(42)</sup>

The present study also revealed that Interferential therapy is beneficial in reducing the urinary incontinence. Similar results are reported by Mantle and Versi (1991) who surveyed the English centers and the general outcome of the report was the best treatment for urinary leakage was 'pelvic floor muscle exercises' in 74% of patients seen where as interferential therapy considered 63% to give good result. There are more results that agree with the use of 'Interferential therapy'.<sup>(43)</sup>

According to Laylock and Green (1988) found improvement in symptoms of Urinary incontinence, after six to 10 repetitions of interferential therapy who have been using low frequency current by use low amplitude current in the nerve root at S3 by implementing electrodes in the skin. They found the treatment to be safe and effective.

The results of our study are in agreement with Fall and Lindstrom (1991) who suggested that Interferential therapy can be used for two purposes-one to produce muscle contraction and secondly it can be used to attempt to help those patients who are not able to produce voluntary 'pelvic floor muscle contraction'.<sup>(44)</sup>

The purpose of the electrical stimulation is to increase the strength of the 'pelvic floor muscles' that increases the urethral pressure which is done by the stimulation of pudendal nerve to restore the reflex activation and helps in maintaining the coordinated and increased awareness among the kegel muscle.

Interferential therapy at high frequency (50Hz) that results in the contraction of the pelvic group of muscles via the 'pudendal nerve' reflex loop. It has been demonstrated that the stimulation of pudendal nerve will indicate long latency 'spinal cord reflex response'. The reflex stimulus cause number of constrictions of the pelvic muscles. The constrictions can increase the strength of the pelvic floor elevating the bladder neck with its anterior displacement that lengthens the urethra and increases the 'vesico urethral

angle' which results to the recruitment of the motor units in the urinary sphincter by improving the tone of the muscles. <sup>(45)</sup>

The key nerve for electrical stimulation therapy is the pudendal nerve that improves the stress and urges urinary incontinence by causing extensive innervations of the pelvic floor muscle and its proximity to the vagina and the rectum.

Women who have been suffering from urinary incontinence can benefit from Kegel exercises according to new review of studies .The researchers found that the pelvic floor muscles exercise programs are more effective only if the patients are exercising the correct group of muscles and they must be given proper support in continuing the exercise. <sup>(46)</sup>

'Dumoulin' and 'Hay Smith' assess the effects of pelvic muscles training in women with urine leakage problems in comparison to the females who remain not treated. After the inspection of the 8 studies which showed that women who underwent treatment had 17 times more chances of decreasing the urinary outflow than the group who did not receive any treatment. Therefore this study is in agreement with the present study that the 'pelvic floor muscles' found to be more beneficial in the treatment of urinary dysfunction. <sup>(47)</sup>

Child bearing age is considered to be a well known causative factor for urinary leakage between the young and middle aged women. It has been addressed that females who delivered vaginally are the main contributing factor to this condition. Due to the deterioration of the important muscles, nerves, tissues associated with the pelvic diaphragm and parity increases the chances of the risk of urinary leakage in 'post-menopausal women' .The first delivery found to be cause more effect on the straining process than the consecutive deliveries which had very less effect . Both the women who underwent vaginal delivery and those with cesarean section, have a high risk of incontinence compared to women who had not given birth to a child but when compared to the vaginal delivery outcomes, cesarean section proved to be defensive against urinary incontinence. <sup>(26)</sup>

According to koebel et al , the females who delivered vaginally lead to stress incontinence through following mechanisms; vascular injury to the pelvic floor muscles

due to the force generated by part of the fetus, direct trauma to the urinary passage at the process of 'labor and delivery'.

There are few studies which are in disagreement due to the effect of 'parity' and 'mode of delivery' in urinary leakage. The study conducted by Buchsbbaum and colleagues, they took sample of 143 pairs of nulliparous postmenopausal sisters and concluded that vaginal birth appears not be associated with type of incontinence rather than familiar predispositions has an important role in the urinary problems.

Sugaya et al (2003) reported that, by using computerized pocket size device also proved helpful to perform the 'pelvic floor muscle' exercises. 46 women were distributed into two groups by using the pamphlets with the sound device and results showed better recovery in the urinary leakage experienced by the females and pad test who were in the device group in comparison to other group.

There study conducted by Henalla et al (1989) who compared electrical stimulation (interferential) with the vaginal estrogens and results showed that there is less amount of leakage of urine on the pad test in the electrical stimulation group contrast to the estrogen group.

There are several consensus reports on the strengths of the have concluded that 'voluntary contractions' are more effective than electrical stimulation. These conclusions are well supported by the study conducted by Bo and Talseth who documented that 'voluntary contraction' was are more appropriate in increasing the urethral pressure compared to the electrical stimulation.

## **5.1 LIMITATIONS OF THE STUDY**

1. Sample size was small.
2. Control group was not taken.
3. Bladder diaries have not been included in the study.
4. Duration of the study should have been taken more than 6 weeks.
5. Convenient sampling was used in the study.

## **6. CONCLUSION**

From the data analyzed and results, it has been concluded that both the Interferential therapy and kegal exercise group has significant improvement with-in the group , but kegal exercises showed much more effectiveness in treating urinary incontinence on post-menopausal women.

### **6.1 FUTURE SCOPE OF THE STUDY**

1. Inclusion of the bladder diary as another variable could provide more detailed information about the efficacy of the interventions.
2. Follow up studies could be done to check the long lasting effect of both the treatments.
3. The women with hypertension, diabetes mellitus and hypothyroidism could be included for the further study to check the exact efficacy of these alternative interventions.
4. Future study need to be done on large sample size.
5. Random sampling can be used in future studies.

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## 6. APPENDICES

### 6.1. Appendix

#### CONSENT FORM

PATIENT IDENTIFICATION NUMBER:

**Title of the research:** Effect of interferential therapy versus Kegel exercises with urinary incontinence on post-menopausal women.

I confirm that I have read and understand the information sheet for the above study.

I have had opportunity to consider the information, and ask question and have had these answered satisfactorily.

I understand that my participation is voluntary and I am free to withdraw at any time, without giving any reason, without any medical care and legal rights affected.

I understand that relevant section of any of my medical notes and data collection during the study may be locked by responsible regulatory authorities for the research purpose.

I agree to my general practitioner being informed of my participation in the study.

I agree and give my voluntary consent to take part in the research study.

Investigator: Rimzim Gupta

Class: MPT-OBG (II year)

Date:

Signature:

Name of Subject:

Date:

Signature:

## 6.2. Appendix

### ASSESSMENT FORM

Name:

Date:

Age:

Gender:

Address:

Chief complaint:

#### STORAGE SYMPTOMS

Stress leakage:  Present  Absent

Urgency:  Present  Absent

Urge Incontinence:  Present  Absent

Frequency:  Present  Absent

Nocturia:  Present  Absent

#### FREQUENCY OF LEAKAGE

Never:

About 1 per week or less:

2-3 per week:

About once a day:

More than 1 per day:

#### Voiding Symptoms

Hesitancy:  Present  Absent

Slow Stream:  Present  Absent

Intermittent Stream:  Present  Absent

Feeling of incomplete emptying:  Present  Absent

### **HISTORY OF PRESENT CONDITION**

Onset date:

Triggers for leakage:

Type of pads:

No of pads used per day:

### **GYNAECOLOGICAL HISTORY**

Menopause/Yr/HRT

Sexually active:  Yes  No

Dyspareunia:  Yes  No

Surgery:  Yes  No

### **OBSTETRIC HISTORY**

Gravida

Parity:

Living:

Abortion:

Type of Delivery:  Normal Vaginal Delivery  Cesarean Section

### **MEDICAL HISTORY**

Back pain:  Present  Absent

Hypertension:  Present  Absent

Diabetes:  Present  Absent

**EXAMINATION**

Built of the patient:

Observation of the perineum:

Effect of cough:

**PELVIC FLOOR MUSCLE EXAMINATION**

Contraction-  Aware  Not aware

Hold time:

Repetitions

Fast repetitions

Reflex to cough

**Diagnosis:**

### 6.3. APPENDIX

#### MASTER CHART

Urinary Incontinence											
GROUP : A (Interferential therapy)											
Sr. No	Code	Age	G	Height	Weight	BMI	No of Parity	No of Abort ion	Pad Test		Improv ement
									Pre test (gm)	Post test (gm)	
1	A01	50	F	158	78	31.2	3	0	2.2	1.6	0.6
2	A02	49	F	155	70	29.1	2	0	2.3	1.8	0.5
3	A03	55	F	150	69	30.6	4	2	3	2.6	0.4
4	A04	48	F	153	65	27.7	1	0	2.1	1.9	0.2
5	A05	49	F	158	72	28.8	2	1	2	1.9	0.1
6	A06	51	F	161	70	27	3	0	3.9	3.5	0.4
7	A07	52	F	158	73	29.2	4	0	2.8	2.7	0.1
8	A08	55	F	167	80	28.6	3	1	3.3	2.8	0.5
9	A09	50	F	154	78	32.9	2	0	2.5	2.3	0.2
10	A10	54	F	161	80	30.9	2	0	2.1	1.9	0.2
11	A11	52	F	155	72	30	3	0	2.8	2.5	0.3
12	A12	53	F	166	78	28.3	4	1	3.7	3.4	0.3
13	A13	49	F	153	64	27.3	2	0	2.5	2.2	0.3
14	A14	48	F	159	69	27.3	1	0	3	2.7	0.3
15	A15	51	F	154	72	30.4	2	1	3.2	2.8	0.4
16	A16	52	F	152	74	32	4	1	2.5	2.4	0.1
17	A17	53	F	162	80	30.5	2	0	2.7	2.3	0.4
18	A18	54	F	159	80	31.6	3	1	2.1	1.9	0.2
19	A19	52	F	157	76	30.8	4	2	3	2.7	0.3
20	A20	50	F	153	71	30.3	2	1	3.2	2.7	0.5

### 6.3. APPENDIX

#### MASTER CHART

Urinary Incontinence											
GROUP : B (Kegel Exercise)											
Sr. No	Code	Age	G	Height	Weight	BMI	No of Parity	No of Abort ion	Pad Test		Improv ement
									Pre test (gm)	Post test (gm)	
1	B01	51	F	161	66	24.5	4	1	2.4	1.9	0.5
2	B02	52	F	158	71	28.4	3	0	2.2	1.9	1.3
3	B03	54	F	155	69	28.7	1	0	2.5	2	0.5
4	B04	55	F	152	74	32	3	0	2.3	1.8	0.5
5	B05	55	F	150	68	30.2	2	2	3	1.9	1.1
6	B06	49	F	152	68	29.4	3	1	3.5	2.8	0.7
7	B07	45	F	164	69	25.6	2	0	2.1	1.5	0.6
8	B08	49	F	158	71	28.4	2	1	2.3	1.7	0.6
9	B09	48	F	152	60	25.9	2	0	2.3	1.9	0.4
10	B10	50	F	152	62	26.8	3	0	2.8	1.3	1.5
11	B11	54	F	155	69	28.7	2	1	2.5	1.5	1
12	B12	53	F	152	51	22.1	1	0	3	2.4	0.6
13	B13	52	F	151	50	21.9	2	0	3.5	2.7	0.8
14	B14	51	F	157	62	25.1	3	1	2.1	1.5	0.6
15	B15	51	F	153	65	27.8	1	0	2.3	1.9	0.4
16	B16	49	F	151	53	23.2	2	1	3.4	1.5	1.9
17	B17	47	F	152	50	21.6	3	2	3.2	2.3	0.9
18	B18	54	F	155	55	22.9	2	0	2.7	2	0.7
19	B19	55	F	159	69	27.3	2	0	2.8	1.5	1.3
20	B20	59	F	153	64	27.3	3	0	2.1	1.8	0.3

## **6.4. Appendix**

### **TREATMENT PROTOCOL**

**Interferential therapy:** Interferential therapy with frequency sweep of 10- 20 Hz for 15 minutes for 6 weeks.

**Kegel exercise:** Kegel exercises for total duration of 6 weeks with 20 repetitions three times daily for 15 minutes with 6 seconds rest in between.

This intervention performed for 6 days per week for one and half month.

## 6.5. Appendix

### ASSESSMENT TOOLS

1. Wall mounted Measuring scale.
2. Weighing machine (Model No: HD-2006A2, Shriyan).



Weighing machine (Model No: HD-2006A2)



Wall mounted Measuring scale



Sanitary Pad





Interferential Therapy Machine

## ABSTRACT

### EFFECT OF INTERFERENTIAL THERAPY VERSUS KEGEL EXERCISES WITH URINARY INCONTINENCE ON POST MENOPAUSAL WOMEN

Gupta Rimzim<sup>1</sup>, Manpreet<sup>2</sup>

1. Post graduate student, MPT-OBG,
  2. Lecturer, Department of Physiotherapy, Lovely Professional University, Phagwara-144402
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**Background and Purpose:** Urinary Incontinence is a significant cause of disability and dependency among the elderly population. The common form of incontinence is the stress urinary incontinence which occurs as a result of sudden rise in the intra-abdominal pressure due to the physical activity such as coughing, sneezing and lifting. The aim of the study was to compare and evaluate the interferential therapy and Kegel exercise for the treatment of urinary incontinence on post-menopausal women.

**Design:** Experimental study comparative in nature.

**Participants:** 40 participants between 45 to 55 years age group experiencing the urinary incontinence are included in the study.

**Intervention:** Group A received Interferential therapy for 6 weeks whereas Group B performed Kegel exercise for the same duration of time.

Outcome Measure: Weight of Sanitary Pad

**Result:** The mean age of Interferential therapy group was  $51.35 \pm 2.21$  and that of Kegel exercises was  $51.26 \pm 2.92$ . The Significance value of unpaired t-test value was 0.91 ( $p > 0.05$ ). There was no significant difference in the age group.

The mean BMI of Interferential therapy group was  $29.24 \pm 1.51$  and that of Kegel exercises was  $28.53 \pm 2.25$ . The Significance level of unpaired t-test value was 0.255 ( $p > 0.05$ ). There was no significant difference in the BMI of both the groups.

The mean, SD Age of Interferential Therapy Group was  $51.35 \pm 2.21$  and mean, SD BMI of Interferential Therapy Group was  $29.24 \pm 1.517$  respectively. The r value was 0.623 and p-value was 0.003. There was positive correlation coefficient of age and BMI of the subjects for Interferential Therapy Group.

The mean, SD Age of Kegel Exercise Therapy Group was  $51.26 \pm 2.92$  and mean, SD BMI of Kegel Exercise Therapy Group was  $28.53 \pm 2.257$  respectively. The r value was 0.924 and p-value was 0.000. There was positive correlation coefficient of age and BMI of the subjects for Kegel Exercise Therapy Group.

The mean duration of Pre-Test and Post-Test was 2.74 & 2.43 respectively for Interferential Therapy Group. The “t” value was 9.643 and the p-value was 0.000. Thus there was significant difference between Pre-test and Post-Test in Interferential Therapy Group. The statistical significance level was  $p < 0.05$ .

The mean duration of Pre-Test and Post-Test was 2.65 & 1.89 respectively for Kegel Exercise Group. The “t” value was 8.121 and the p-value was 0.000. Thus there was significant difference between Pre-test and Post-Test in Kegel Exercise Group. The statistical significance level was  $p < 0.05$ .

Comparison of Mean and SD of difference between Pre-test and Post-test of Interferential therapy group and Kegel Exercise Group by using Unpaired t-test. The mean duration of Interferential therapy group and Kegel Exercise group was 0.315 & 0.837 respectively. The “t” value was 5.3040 and the p-value was 0.0001. Thus there was significant difference between the improvement in Interferential Therapy Group and Kegel Exercise Group. The statistical significance level was  $p < 0.05$ .

**Conclusion:** From the data analyzed and results, it has been concluded that both the Interferential therapy and Kegel exercise group has significant improvement with-in the group , but Kegel exercises showed much more effectiveness in treating urinary incontinence on post-menopausal women.

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**Key words:** Urinary Incontinence, Kegel Exercise, Interferential Therapy