

## Effectiveness of App-Based Versus Supervised Pelvic Floor Muscle Training for Women with Urinary Incontinence: A Single Blind Study

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### Abstract:

**Background:** This study aim is to determine the effects of app-based PFMT vs Physiotherapist supervised PFMT for women with urinary incontinence. This study includes a group of 76 women with urinary incontinence. Urinary incontinence is characterized by the leaking of urine involuntarily, and its common condition affecting the daily life activity of women worldwide. The first conservative care is pelvic floor muscle training given by a physiotherapist, but in this technology world app-based interventions have become the alternative for clinical setting as it is convenient and accessible anywhere and at any time. **Materials and Methods:** A study was conducted in Saveetha Medical College Hospital in the district of Chennai. Women with the age group of 20-30 who were clinically diagnosed with urinary incontinence were included. All the participants were randomly divided into two group, Experimental group underwent app-based PFMT and Control group underwent physiotherapist supervised PFMT. All the participants were analysed by using ICIQ - FLUTS Tamil questionnaire. **Results:** Urinary incontinence has been Significantly improved after 6 weeks of intervention in both groups. The app-based PFMT group has significantly improvement in voiding and incontinence symptoms in voiding and incontinence than the physiotherapist supervised PFMT group. **Conclusion:** This study concludes that the app-based PFMT can show long term results in improving urinary incontinence in women than supervised physiotherapist PFMT.

**Keyword:** Urinary incontinence, pelvic floor muscle training, app-based pelvic floor muscle training, ICIQ-FLUTS.

### Introduction

Urinary incontinence is the most common pelvic floor dysfunction that affects women. As per the International Continence Society (ICS) and the International Urogynaecology Association (IUGA), if a woman complains of unable to control the urine leakage, it is defined as urinary incontinence <sup>[1]</sup>. Stress incontinence, urge incontinence and mixed incontinence are the various types of urinary incontinence, this classification is based on the cause and how it affects the population in daily life.

When there is an increase in abdominal pressure, urine leakage occurs, this type of incontinence is called stress incontinence. Patient may complaint of sudden urge to void urine, it is referred as overactive bladder or Urge incontinence [2]. Some may get suffered by both symptoms, this type of incontinence is called mixed incontinence. This can affect women in their daily life activities and can lead to social embarrassment and loneliness [3].

About 48.58% of female athletes were suffered by urinary incontinence [4]. In India about 2.5% to 60% of multiparous women are being suffered by incontinence [5]. A Prevalence study done in south-India has shown that up to 29.4% of women are being suffered from urinary incontinence [6].

Pelvic floor muscle training is the first line of conservative care given to the women suffering from urinary incontinence [7], other physiotherapeutic management like combined therapy of pelvic floor muscle training with electrical muscle stimulation, biofeedback or electromyography and vaginal cones also known as weight cones for pelvic floor strength training are also used [8]. Arnold Kegel published a study on pelvic floor muscle rehabilitation for patients with urinary incontinence. He states that the most effective way to improve pelvic floor dysfunction is through pelvic floor muscle rehabilitation, either in anatomy or functional terms [2].

Kegel Exercise for Women App can be used as a personal tool that women can easily follow. There are up to ten levels from beginners to pros, this helps in easy understanding and progression can be made by increasing the levels. Women can work out anytime without strangers or family even noticing them as this app gives vibrations cues when kept in silent mode. The app also allows women to make a reminder to perform exercise at a preferable time which they can choose.

International Consultation on Incontinence Modular Questionnaire on Female Lower Urinary Tract Symptoms (ICIQ-FLUTS) Tamil questionnaire developed by the International Consultation on Incontinence designed for self-execution. Many women don't report the lower urinary tract symptoms because it is told as intimate. This questionnaire allows women to understand symptoms in their own language, making it easier to identify the difficulties like filling, voiding and incontinence faced by the patient. ICIQ-FLUTS Tamil provides satisfaction results in construct validity and reliability, internal consistency and responsiveness [9].

After reviewing previous studies there are various interventions that help in strengthening PFM in women with urinary incontinence. This study was aimed to compare the effect of App based PFMT and physiotherapist supervised PFMT for women with urinary incontinence in 6 weeks of intervention, the conclusion of this study is that there is any significant improvement in both group, App-based PFMT and Physiotherapist supervised PFMT for women with urinary incontinence.

## Methodology

The research design involved a comparison of app based training and supervised pelvic floor muscle training. A group of 76 women were divided into 2 groups, group A consisted of 38 women and group B consisted of 38 women using a simple random sampling technique. The main assessor was not involved in any intervention and was blinded to group allocation. This study was conducted for about 6 weeks at Saveetha Medical College Hospital in Chennai district. Participants were between the age group of 20-30 years symptoms with urinary incontinence and multiparous women were eligible for this study. Participants with history of neurological condition, urinary tract infection, systemic illness or malignancy in reproductive organ, pelvic organ prolapse, undergone any recent pelvic surgical procedures like vaginal repair, sling procedure were excluded from the study. All the participants were assessed by using ICIQ - FLUTS Tamil questionnaire before and after the intervention. All the participants were explained about the questions from ICIQ-FLUTS Tamil and the baseline calculation was done for pre intervention assessment. Group A participants were given app-based pelvic floor muscle training and group B participants were given physiotherapist supervised pelvic floor muscle training and the post intervention assessment were done after 6 weeks of intervention.

A group of 100 participants were examined for the eligibility criteria, from that 15 participants were not meeting the inclusion criteria and they were excluded from the study and 9 of them declined to participate in the study. Out of that, 76 participants were eligible and willing to participate in the study based on inclusion and exclusion criteria and were divided into group A (38) and group B (38) using simple random sampling technique. The informed consent was obtained from all the participants and was explained about the procedure. The pre-test and post-test scores have been obtained before and after the intervention procedure by using ICIQ - FLUTS Tamil.

### Intervention procedure:

The Randomized 38 participants in group A were given app-based PFMT and the other 38 participants in group B were given Physiotherapist supervised PFMT.

### Kegel Exercises for Women app

The Kegel Exercises for women app provides voice instructions to guide the participants for PFMT contraction, such as when to contract and sustain or when to contract and relax. It also gives vibration cues when kept in silent mode, so participants can work-out anytime without anyone noticing. This app allows making reminder for thrice a day in preferable time of their own to encourage the participants to perform PFMT without fail.

**Physiotherapist supervised PFMT:**

The participants work out through the whole sequence of commands, and were asked to perform these at home in supine lying thrice a day for 6 weeks. The PFMT protocol proposed consist of

1. Sustained contraction lasting for 3 seconds and rest for 3 seconds, with 10 repetitions and 3 sets.
2. Fast contraction lasting 1 second with same resting time, with 10 repetition and 3 sets

As patients improved, the same protocol was asked to apply from supine to seated and standing position.

**Statistical Analysis:**

Statistical data analysis was ruled out in the present study. outcome measurement was analysed and are presented as mean. Significance is assessed at 5% level of significance with p value set as 0.0001 and with the confidence interval of 95%, less than that is considered as statistically significant difference. To determine the statistical difference within the group, paired t test was used on the ICIQ - FLUTS Tamil questionnaire to identify the improvement after 6 weeks of intervention. To determine the statistical difference between the two groups, unpaired t test was used on the ICIQ-FLUTS Tamil questionnaire to identify the improvement after 6 weeks of intervention. The data was analyzed using SPSS statistical version of 16 for their mean, standard deviation, paired t test, unpaired t test.

**Results:**

A total of 76 participants were included in this study based on inclusion and exclusion criteria. The data was analyzed for those participants. The overall mean for ICIQ – FLUTS Tamil pre test was 24.39 in group A and 29.28 in group B with the standard deviation of 7.25 and 7.20 respectively. The overall mean for ICIQ – FLUTS Tamil post test was 22.21 in group A and 27.89 in group B with standard deviation of 6.40 and 6.04 respectively.. In comparison of App-based PFMT with Physiotherapist supervised PFMT both showed improvement in symptoms with confidence interval of 95% for urinary incontinence. There was a statistically significant difference between the App-based PFMT and Physiotherapist supervised PFMT. This shows that App-based PFMT training improved the symptoms effectively for women suffering from urinary incontinence better than the Physiotherapist supervised PFMT.

ICIQ-FLUTS Tamil	Pre-Test				
	Mean				SD
	F	V	I	Overall	Overall
Group-A	7.00	4.57	12.81	24.39	7.25
Group-B	8.28	5.47	15.52	29.28	7.20

ICIQ-FLUTS Tamil	Post-Test				
	Mean				SD
	F	V	I	Overall	Overall
Group-A	6.13	4.07	11.63	22.21	6.40
Group-B	7.57	5.05	15.26	27.89	6.04

### Discussion:

Urinary incontinence is a condition that causes involuntary leakage of urine due to pelvic floor muscle imbalance. Therefore, pelvic floor muscle exercise improves the strength of pelvic floor muscle. The present study result demonstrated that app-based PFMT is effective in quality of life of the women suffering from urinary incontinence which was measured by using ICIQ - FLUTS Tamil. As app-based pelvic floor training is effective in cost-efficient for the patient, after learning a proper mechanism of how to perform the exercise women can easily perform this anywhere without the help of pelvic physiotherapist. As this study states the both groups had improvement, but considering long term in pelvic floor health app based training is more efficient than the training given by physiotherapist.

A systematic review by Yoqing Hou et al., 2022 stated urinary incontinence patients using mHealth app- based PFMT had a beneficial effect on depression symptoms and quality of life of women who are non-pregnant, but the muscle activity was not analysed <sup>[11]</sup>. Sánchez et al., 2019; done a systematic review, states that short sessions with increased frequency PFMT helps in urinary incontinence in women in any case of age from young to old or in BMI lean to obese <sup>[12]</sup>. Asklund et al., 2016; did a study with the mobile app PFMT for 3 months duration, the symptomatic effect was measured using pad test, but there were difficulties in follow ups <sup>[13]</sup>. De Araujo et al., states that the symptoms such as urge to void and number of voiding times were reduced, which helped in the better quality of life, he also states that, this PFMT requires patients to undergo complete effort for better results <sup>[14]</sup>. Nienke J. Wessels et al., conducted a study to know the view of therapist on app-based treatment for incontinence, the study states

that due to this busy world, time or money spending for exercise is more difficult so app-based training is effective but for the first few sessions it should be conducted by the physiotherapist until the patient learns how to perform the exercises [15].

### **Limitations and Suggestions:**

- Small sample size, considering the prevalence rate larger sample size should be taken
- Age limitation only 20–30-year women were included
- Study was done in a single hospital, therefore broader population in different settings can be taken.
- Long term follow-up could have been done.

### **Conclusion:**

This study shows that, there is progression in the strength of pelvic floor muscle for women with urinary incontinence when using App based training than Physiotherapist supervised pelvic floor muscle training for women with urinary incontinence and was measured using ICIQ-FLUTS Tamil questionnaire. However, there is a significant difference in the improvement of Symptoms in urinary incontinence, there is a higher chance that in long term rehabilitation patients would consider app-based PFMT rather than physiotherapist supervised PFMT as it is cost effective and easily available whenever they want to perform the floor exercises.

### **Acknowledgement:**

Author would like to thank all the participants who were participated in the study.

### **Conflict Of Interest:**

Authors declare that there is no conflict of interest.

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