International Journal of Yoga, Physiotherapy and Physical Education
ISSN: 2456-5067
Impact Factor: RJIF 5.24
www.sportsjournal.in
Volume 3; Issue 1; January 2018; Page No. 121-124

Effects of pelvic floor muscle training vs an assisted pelvic floor muscle training among rural perimenopausal women with urinary incontinence: A comparative study

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Abstract
Perimenopause is a period of transition from reproductive adulthood to menopause. Most of women in perimenopause and menopause suffer from urinary incontinence. Physical therapy interventions such as pelvic floor exercises are one of the most effective and low risk solutions for urinary incontinence. It helps to retrain the bladder and strengthen the pelvic floor muscles to help resolve the problem. The study was carried out in Department of Community Physiotherapy, Dr. A.P.J Abdul Kalam College of physiotherapy, Loni. Women with urinary incontinence were involved in this study. Study involved 30 participants with age group of 30-45. Participants were divided into two groups; group A received Pelvic floor muscle Training (PFMT) while Group B received Assisted pelvic floor muscle Training (APFMT) for 4 weeks. Symptoms of Urinary incontinence were assessed pre and post intervention, ICIQ-SF and QUID questionnaire were used to assess the prevalence, type, frequency and perceived cause of urinary incontinence, and its impact on everyday life. Data analysis was done by using the Paired "t" test and unpaired "t" test to compare mean values. The result showed statistically significant improvement in the Group B as compared to Group A. The present study concludes that Assisted pelvic floor muscle Training (APFMT) is more effective in decreasing the symptoms of urinary incontinence than Pelvic floor muscle Training (PFMT).

Keywords: pelvic floor exercises, assisted pelvic floor exercises, perimenopausal women, urinary incontinence

1. Introduction
The International Continence Society defined Urinary incontinence (UI) as any unintentional leakage of urine. It is more common in women than men. Urinary incontinence is often a common problem among middle aged and older women [1]. The amount that leaks varies; it may be a few drops or more, depending on severity. Risk factors for Urinary incontinence are intrinsically weak connective tissue, obesity, prior hysterectomy, pelvic floor trauma after vaginal delivery, menopause and old age [2]. The risk of developing UI increases with drinking alcohol or caffeine which fill your bladder quickly causing you to urinate more often, infections of your urinary tract or bladder may cause temporary UI, nerve damage can interrupt signals from your bladder to your brain so you don't experience the urge to urinate, certain medications, constipation and being overweight all this can unconstructively impact your ability to control urination. In general, the choice of treatment primarily depends on the balance between efficacy and the associated complications [3]. Around, 50 million people worldwide suffer from urinary incontinence and the prevalence of UI increases with age in which women to men ratio is 2:1 and an estimated of 41% - 57% of older women above 40 years of age in the US suffer from this disabling condition. In a survey done in Asia, the prevalence of urinary incontinence in India was 12%. There are three subtypes of Urinary incontinence: stress urinary incontinence (SUI), urge urinary incontinence (UUI) and mixed urinary incontinence (MUI). SUI is characterized by involuntary loss of urine without any previous feeling of a need to void, which occurs while under a physical stress like cough, lifting something heavy or any other physical activities. In urge incontinence there is unintentional loss of urine which is caused by the bladder muscle contracting, generally associated with a sense of urgency. In Mixed urinary incontinence there is unintentional leakage with uneven proportions of urgency and also with exertion, sneezing or coughing [4]. The pelvic floor makes is an important piece of your body's core and it supports the structures the abdominal cavity -muscles and organs, the bones in the spine, controls the passage of stool and urine and also facilitates the childbirth process [5].

Menopause is the time in a women's life when the function of the ovaries ceases and the ovaries are the main source of female hormone. The menopause transition is a series of stages from early peri-menopause and late peri-menopause to post-menopause defined by changes in menstrual and hormonal. Women in perimenopause also have symptoms like breast tenderness, Worse premenstrual syndrome, Fatigue, Irregular periods, Urinary leakage when coughing or sneezing, Urinary urgency, mood swings, trouble sleeping. Being in peri-menopause, women are 1-2 times more likely to develop incontinence. During perimenopause there is fluctuation and

estrogen levels average about 20–30% higher than during premenopausal [6].

A study done by Cammu and VanNylen included 60 women with SUI, 30 minute of Pelvic floor muscle training (PFMT) session with vaginal cones for 12 weeks groups who used the cones 2 times per day for 15minutes for 12 weeks. In PFMT group results were equally significant and those groups who used vaginal cones were less compliant which suggested that this may not be the best treatment for women with SUI. Wall and Davidson in their study suggested that Pelvic floor muscle exercises are useful in prevention of SUI. Bo *et al*. assessed females with SUI over 6 months. Total no. of participants were 107 and reported greater improvement with PFMT when compared to vaginal cons and ES. It stated that PFMT exercises are safe and effective. Thus PFMT should be offered as the first choice of treatment for SUI [7].

The treatment of PFM dysfunction associated with SUI, is that facilitation and strengthening of the PFM may improve efficiency of the sphincter action around the urethra and support the pelvic organs. With treatment, they are able to manage stress incontinence and improve their overall well-being. Pelvic floor exercises are a safe and effective means of decreasing the symptoms and signs of stress incontinence. Treatment of the PFM in the form of Kegel's Exercises is done which helps in stabilizing the urethra by increasing the PFM strength [8].

2. Methods and Materials

This study was done using convenient sampling, 30 participants were selected. The participants were selected according to inclusion and exclusion criteria. The study received approval from Institutional Ethical Committee Ref no. PIMS/CPT/IEC/2017/481 of Dr. APJ Abdul Kalam College of Physiotherapy, Pravara Institute of Medical Sciences; Loni. All the participants referred in Community Physiotherapy department and Obstetrics and Gynecology OPD and IPD of Pravara rural hospital were screened according to inclusion and exclusion criteria. The degree of incontinence was determined by Questionnaire for Urinary Incontinence Diagnosis (QUID) and The International Consultation on Incontinence Modular Questionnaire ICIQ-SF before and after intervention to determine frequency and amount of leakage. Participants were divided into two groups: Group A included Fifteen participants for PFMT and Group B included Fifteen participants for APFMT. Both groups were instructed to perform the exercises twice a day, once in the morning and once in the evening. During exercises, participants were further encouraged to not hold their breath or squeeze their buttocks. Information on good bladder habits on day one was given to the subjects. Participants were instructed to lie in supine position as starting from lying down may feel easier for some women when first starting out because when pelvic floor exercises performed in lying down position there is decreased load on the pelvic floor and gravity does not increase pelvic floor muscle loading. Participants were instructed to contract the muscles and hold for few seconds and then relax pelvic floor muscle.

Fig 1: Pelvic floor exercise (group A)

Fig 2: Pelvic floor exercise with ball squeeze (group B)

Fig 3: Pelvic floor exercises with resistance band (group B)

3. Data Analysis

In the study, the total number of participants selected were 30 (n=30). College of Physiotherapy Loni, Taluka Rahata District Ahmednagar, Maharashtra, India. Thirty participants (n=30) were evaluated using ICIQ-SF and QUID. Data was collected and presented in tabular form and analyzed by using the Paired "t" test and unpaired "t" test to compare mean values.

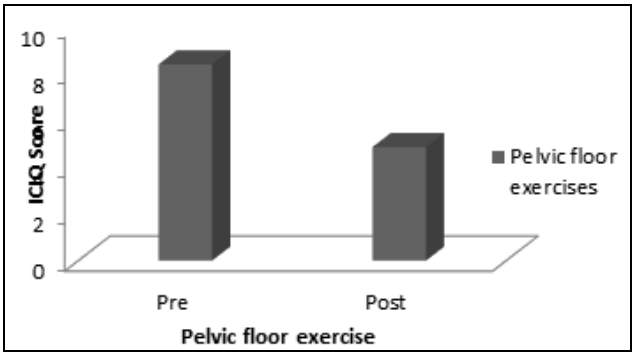

Fig 4: Represents comparison of mean of pre and post of. ICIQ

Result 1: figure no. 4 represent a Comparison of mean in pre and post intervention of ICIQ with pelvic floor exercises, t value was7.119, and p<0.0001 using student paired 't' test within the group which shows extremely significant difference.

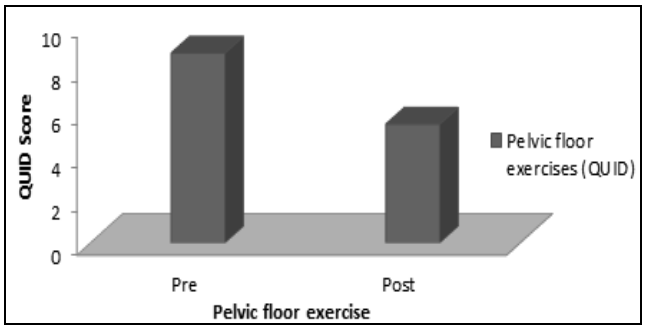

Fig 5: Represents comparison of mean of pre and post of QUID

Result 2: figure no. 5 represent a Comparison of mean in pre and post intervention of QUID with pelvic floor exercises, t value was 11.504, and p<0.0001 using student paired 't' test within the group which shows extremely significant difference.

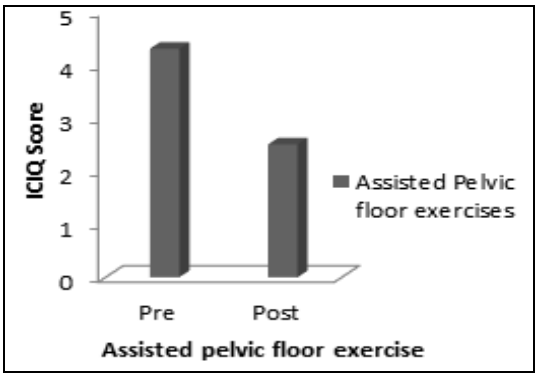

Fig 6: Represents comparison of mean of pre and post of. ICIQ

Result 3: figure no. 6 represent a Comparison of mean in pre and post intervention of ICIQ with Assisted pelvic floor exercises, t value was 7.770, and p<0.0001 using student paired 't' test within the group which shows extremely significant difference.

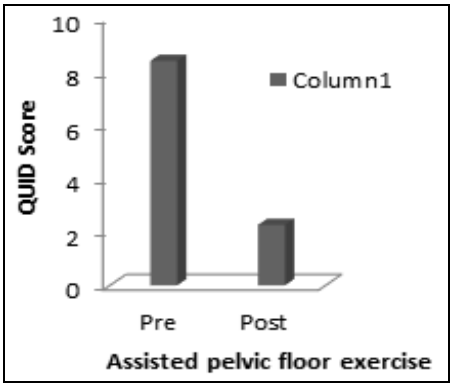

Fig 7: Represents comparison of mean of pre and post of. QUID

Result 4: figure no. 7 represent a Comparison of mean in pre and post intervention of QUID with Assisted pelvic floor exercises, t value was 9.599, and p<0.0001 using student paired 't' test within the group which shows extremely significant difference.

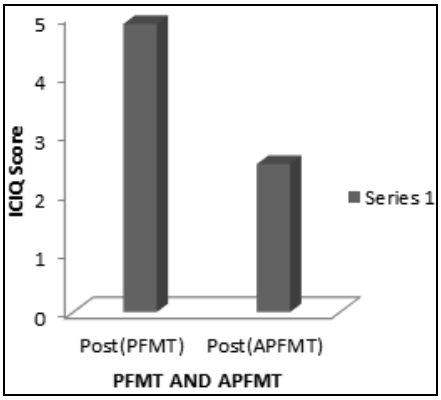

Fig 8: Represents comparison of mean of post ICIQ between PFMT AND APFMT

Result 5: figure no. 8 represent comparison of mean of post ICIQ between PFMT AND APFMT, t value was 5.417, and p<0.0001 using student unpaired 't' test within the group which shows extremely significant difference.

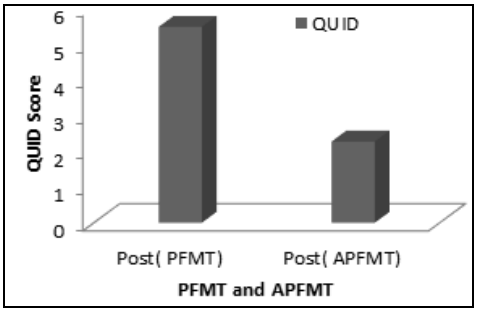

Fig 9: Represents comparison of mean of post QUID between PFMT AND APFMT

Result 6: figure no. 9 represent comparison of mean of post QUID between PFMT AND APFMT, t value was 4.870, and $p<0.0001$ using student unpaired 't' test within the group which shows extremely significant difference.

4. Discussion

Pelvic floor exercises treats urinary incontinence symptoms by reinforcing weakened pelvic floor muscle and improving elasticity. It also improves the tone and function of the pelvic floor muscles. In rural India where many treatment options are not available this type of low cost effective treatments are beneficial to women anywhere, anytime and requires no special equipments and exercises are very easy to understand. It also helps to improve quality of life in perimenopausal and menopausal age. Measures to prevent and treat pelvic floor weakness not only have the potential to produce major health savings but can reduce the physical, psychological, social and sexual problems for the women involved. The urinary leakage in stress urinary incontinence can be due to the inadequate urethral support from the endopelvic fascia and muscles, resulting from intrinsic sphincter deficiency and increased pressure of intra abdominal [4].

Assisted pelvic floor muscle training with resistance band are great for functional strengthening exercises that improves strength for daily activities and are easily progressed from light resistance to heavy resistance allowing for progressive strengthening. Performing pelvic floor exercises with ball squeeze also helps to strengthen the inner thigh and the abdominal muscles, which link with those pelvic floor muscles and this contribute to better bladder control. Therefore, assisted pelvic floor exercises are more effective in strengthening pelvic floor muscles. Bushnell *et al*. in their study proved that Urinary Incontinence (UI) is a common problem among women. A study done by Hulme and Nevin found that the patients who performed the APFMT program with EMG measurements showed greater increase in electrical activity of pelvic floor.

A study done by Betsy Donahoe-Fillmore compared two pelvic floor muscle training programs in females with stress incontinence, this study supports the notion that PFMT decreases symptoms of SUI but may not provide a total cure and those who participated in the APFMT group reported feeling like they made greater improvements compared to those PFMT group [9].

A study done by Aparna Joshi *et al*. on Effectiveness of Pelvic floor exercises on Stress Incontinence among Rural Perimenopausal women concluded that regular practice of this low-cost, simple treatment modality can result in improvement of the quality of life of perimenopausal women and a stress free transition into menopause [10].

Limitations of the present study include only subjective methods and no objective method was used.

Therefore, from the present study, it can be proposed that implementing a program focused on increasing the strength and endurance of the pelvic floor musculature through traditional or resisted pelvic floor exercises that includes education regarding prevention of symptoms, will improve the overall quality of life in these individuals.

5. Conclusion

The present study concluded that assisted pelvic floor exercises help in improving strength of pelvic floor musculature and quality of life in women suffering from urinary incontinence.

6. References

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