# Pilot Study on the Effectiveness of Interventional Package on Pelvic Floor Muscle Strength and Knowledge among Women with Pelvic Floor Dysfunction at Selected Settings, Thiruvallur Dist

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## Abstract

***Background:*** Women's health is considered very important in many countries. One of the important aspects of women health is pelvic floor strength. Pelvic floor forms the core foundation of the lower body supporting the abdominal parts and also acts to maintain the continence of bowel and bladder both in male and female. When pelvic floor gets damaged due to any cause, the muscle strength gets weak which will lead to pelvic floor dysfunction. Prevalence of pelvic floor dysfunction was reported to be high among women in rural areas. Rural areas reported a prevalence of 44.2% (38.0 – 50.8 %). Community based nursing interventions are the need of the hour in managing the problem of pelvic floor dysfunction among women.

***Objective:*** The objective of the study was to evaluate the effectiveness of an interventional package on pelvic floor muscle strength and knowledge among women with pelvic floor dysfunction.

***Methods***: Quantitative research approach with experimental design was used. A total of 40 women between 3 months post delivery to one year, with urinary incontinence, bowel incontinence, pelvic organ prolapse, pelvic pain or dyspareunia formed the samples, with 20 women each in the experimental and control groups. Random sampling technique was used - for selection of villages, lottery method; and for selection of samples, total enumeration technique was followed. Data was collected using structured interview schedule and modified oxford grading scale.

***Results:*** Both the data collection tools were found to be highly reliable. Statistical analysis of the background and clinical variables revealed homogeneity between the experimental and control group in the pre-test. The statistical comparison of the level of knowledge and pelvic floor muscle strength revealed that the experimental group 'Z' value was3.42and 3.93 which showed a very high statistical significance at p=0.001. Positive correlation was identified between the level of knowledge and pelvic floor muscle strength, thus indicating that the interventional package was effective.

***Keywords –*** *pelvic floor muscle, pelvic floor muscle strength, interventional package, knowledge, pelvic floor dysfunction.*

## Introduction

Women's health is considered the most important in many countries. Women are exposed to a lot of health risks due to various physiological changes happening within them. One of the important aspects of women's health is pelvic floor strength [1]. Pelvic floor muscle strength is required for proper functioning of the lower abdominal organs in women. Pelvic floor muscles help to keep the urine and feaces inside the bladder and rectum and prevent incontinence. Pelvic muscles strength helps women in experiencing orgasm during sexual intercourse. Any factor which weakens the pelvic floor muscle causes dysfunction in these major functions in women [2].

When pelvic floor gets damaged due to any cause, the muscle strength gets weak which will lead to pelvic floor dysfunction. Pelvic floor dysfunction among women include a group of clinical conditions such as 'urinary incontinence', 'fecal incontinence', 'pelvic organ prolapse', 'sexual dysfunction' and 'chronic pelvic pain'. These problems affect women's health very badly and disrupt the quality of life in women as they get older[3].

The major contributing factors to pelvic floor dysfunction among women include increasing weight, pregnancy and childbirth, frequent lifting of heavy objects, having surgery or injury to pelvic floor and straining bowel patterns. Pregnancy and child birth have long been considered as risk factors in the genesis of pelvic floor dysfunction. The mechanical strain during delivery may give rise to partial denervation of the pelvic floor and injury to the muscle and connective tissue. The etiology is thought to be multifactorial. Traumatic damage to fascial and muscular support structures during childbirth may be an important contributor to the development of urinary incontinence and prolapse of pelvic organ[4-8].

An alarming nature of pelvic floor dysfunction was observed in the recent years and the projections are even worse. The prevalence rate of women experiencing any one of the pelvic floor dysfunctions amongst the women in United States was estimated to be 25.0% (95% CI 23.6, 26.3). The prevalence included 17.1% (95% CI 15.8, 18.4) of women with moderate-to-severe urinary incontinence, 9.4% (95% CI 8.6, 10.2) with fecal incontinence, and 2.9% (95% CI 2.5, 3.4) with prolapses[9-10].

The prevalence rates were found to be high across women in developed and developing countries. In India, studies have reported a prevalence rate of 21% with 19.02% of the women experiencing urinary incontinence and 1.99% experiencing pelvic organ prolapse. The prevalence of incontinence was found to be 18.6% in another study where the prevalence was reported in 12.5% of primi mothers as compared to 26.4% in multiple child births[11].

Prevalence of pelvic floor dysfunction was reported to be high among women in the rural areas. Rural areas reported a prevalence of 44.2% (38.0 – 50.8 %), the reason being that most of the women do a lot of heavy lifting activities and give birth to more number of children[12].

Community based nursing interventions are the need of the hour in managing the problem of pelvic floor dysfunction among women. Many interventions such as weight management, pelvic strengthening exercises, pelvic floor muscle training and behavioral therapy approaches are found to be useful in managing women with pelvic floor dysfunction.

The present study used the preventive model of community based interventions of women who underwent child birth process and included components of awareness generation and

intensive pelvic muscle strengthening activities which would help to prevent the occurrence of pelvic floor dysfunction.

The present study was conducted as a pilot study to know the feasibility of the study plan, intervention protocol and outcomes of the measurement tools.

### Objectives of the study
- To study the feasibility of the interventional package on pelvic floor muscle strength and knowledge among women with pelvic floor dysfunction.

### Materials and Methods

**Research Approach**: Quantitative Research Approach and Experimental design was adopted.

### Sample selection criteria

**Inclusive criteria**: Women
- who were willing to participate in the study
- who could understand Tamil
- Between 3 months post-delivery to one year with pelvic floor dysfunction.

**Exclusion criteria**: Women
- who had undergone pelvic floor exercise training programme
- undergone any surgery in the pelvis
- with Severe Medical and Surgical condition (Stroke, Colostomy)
- with postpartum complication ( wound gaping, infection, cervical tear)

**Sampling technique:** 55 villages adopted by the OACHC were divided into four zones (north, east, west south). Using a lottery method, 2 zones for experimental group and control group respectively were chosen. Total enumeration technique was used to select the samples.

### Variables
**Independent variable**: Intervention Package comprising of video assisted teaching of anatomy and physiology of pelvic floor, meaning, causes and risk factors of pelvic floor dysfunction, types, signs and symptoms, diagnosis, treatment modalities on pelvic floor dysfunction, demonstration of pelvic floor muscle strengthen exercises and importance of maintaining a healthy pelvic floor, demonstration and return demonstration of the Pelvic floor muscle strengthening exercises which include Kegel exercises, Abdominal clams core stabilizer exercise, Bladder control spinal rotation exercise, Sideleg circles exercise, rolling knee step, push up exercise, bridging exercise, alternate arm pulses exercises.

**Dependent variable**: Comprised Knowledge regarding pelvic floor dysfunction and assessment of pelvic floor muscle strength.

**Extraneous variables** are age, education, type of family, monthly income, religion, type of occupation, type of work, food habit, number of child birth, birth spacing between kids, mode of child birth, number of vaginal delivery, number of LSCS, height, weight, weight gain during pregnancy, BMI, induction of labour, duration of second stage of labour, weight of the

baby, post natal period, history of perineal trauma, previous information about pelvic floor exercise

**Ethical considerations**

The study proposal and plan was granted formal ethical approval by the International Centre for Collaborative Research which is the official ethics review board of Omayal Achi College of Nursing. Consent was obtained from the Head of the institution, and the person in-charge of the Omayal Achi Community Health Centre (OACHC), and the village leaders. Written informed consent was obtained from the samples after clear explanation of the study purpose, type of data required, nature of commitments, participation, procedure and potential benefits, and the right to withdraw from the study at any point of time was also explained**.** Confidentiality of all personal details disclosed by the samples and full privacy was assured. Equality and justice was ensured by administering the intervention to the control group at the end of the post-test.

**Study setting**

The study was conducted in eight selected villages, Pandeswaram, Ekambarachatram, Kalaignar Nagar, Kallikuppam (experimental)and Karani, Karalappakkam, Kandigai, Keelkondaiyar, (control) from among the 55 villages adopted by the Omayal Achi Community Health Centre (OACHC). These villages are located at about 5 kms distance in geographically opposite directions from the Omayal Achi Community Health Centre. The total population of mothers - 3 months post-delivery to 1 year in each village was around 10 to 20.

**Instruments**

The tool consisted of the following:

**Data collection tool**

Part A:Tool to assess pelvic floor dysfunction
Part B: Demographic and clinical variables
Part C: Assessment of knowledge using structured interview schedule.
Part D: Tool to assess pelvic floor muscle strength

**Intervention tool**

**Interventional package** consisted of video assisted teaching, demonstration and return demonstration techniques used by the investigator to strengthen the pelvic floor muscle and improve the knowledge in women with pelvic floor dysfunction. It consisted of knowledge components and exercises.

- Video assisted teaching included anatomy and physiology of pelvic floor, causes of pelvic floor muscle weakness, effect of pelvic floor muscle weakness, medical and surgical management, and prevention of complications and importance of maintaining a healthy pelvic floor
- Exercise programme through video assisted teaching, demonstration and return demonstration on Kegel exercise, Abdominal Clams Core Stabilizer Exercise, Bladder Control Spinal Rotation Exercise, Side Leg Circles Exercise, Rolling Knee Step, Push Up Exercise and  Bridging Exercises
- The interventional package was administered individually at their home and its total duration was about 30 minutes. Every woman was asked to maintain a daily chart to tick the column, if she performed the exercises and was sent messages through themobile phone as reminders to perform exercises. Reinforcement was given through the form of a

booklet and community level volunteers, identified by the investigator to reinforce the need to do regular exercises.

## Data analysis

Descriptive statistics such as mean and standard deviation and inferential statistics such as Mann Whitney U-test, Wilcoxon signed rank test, Karl Pearson correlation co-efficient, Kruskal Walls H-test and chi square were used for analyzing the data.

## Results

The reliability of the data collection tools was assessed using Test-retest and split half technique and the correlation coefficient r–value obtained was 0.88 for the knowledge questionnaire and 0.82 for the modified Oxford grading scale. These correlation coefficient values are very high and hence, these tools are reliable enough for assessing the effectiveness of pelvic floor muscle strength and knowledge among women at selected villages, Chennai.

Table 1 showed that the posttest level of total score mean was increased after intervention in the experimental group and the rank test also shows a high statistical significant difference at p<0.001 level, which indicates that the intervention was effective in improving the knowledge about pelvic floor dysfunction.

Table 2 showed that in the control group, the post test level of knowledge score about pelvic floor dysfunction was not increased and also the Z value shows no significant difference which indicates that without giving intervention, there was no difference in knowledge score.

Table 3 revealed that there was a high statistically significant difference between the pre and post test score at p<0.001, which indicates that the interventional package on pelvic floor muscle strength was found to be effective.

Table 4 revealed that there was no statistically significant difference between the pre and post test score in the control group

**Table1: Comparison of the Pre and Post test level of knowledge among women with pelvic floor dysfunction in the experimental group**

N=20

| S.No | Domains | Experimental group | | | | Wilcoxon Signed rank test |
|------|---------|--------|------|--------|------|---------|
| | | Pretest | | Posttest | | |
| | | Mean | SD | Mean | SD | |
| 1 | General Information | 0.85 | 0.93 | 3.25 | 0.97 | Z=3.75 P=0.001*** |
| 2 | Possible causes / Risk factors | 0.70 | 0.73 | 3.65 | 1.04 | Z=3.10 P=0.01** |
| 3 | Signs and Symptoms | 0.70 | 0.66 | 3.80 | 1.51 | Z=3.30 P=0.001*** |
| 4 | Treatment of Pelvic Floor Dysfunction | 1.00 | 0.92 | 1.60 | 0.50 | Z=2.23 P=0.03* |
| 5 | Pelvic floor muscle strength exercises | 1.40 | 0.80 | 5.35 | 1.44 | Z=3.92 P=0.001*** |
| | **Total** | 4.65 | 2.67 | 17.65 | 2.70 | Z=3.42 P=0.001*** |

**\*\*\* Very High Significance at   P≤0.001**

Table 5 showed a positive correlation between the muscle strength and knowledge in experimental group. It indicates that if knowledge increases, the muscle strength increases. It concludes that if the woman has knowledge about pelvic floor dysfunction, she will practice the exercises regularly. Hence the muscle strength increases, whereas in control group there was no correlation between knowledge and muscle strength.

**Table 2: Comparison of the Pre and Postest level of knowledge among women with pelvic floor dysfunction in the control group**

N=20

| Domains | Control group | | | | Wilcoxon Signed rank test |
|---|---|---|---|---|---|
| | Pretest | | Posttest | | |
| | Mean | SD | Mean | SD | |
| General Information | 0.90 | 0.72 | 1.10 | 0.73 | Z=1.01 P=0.37,N.S |
| Possible causes / Risk factors | 0.65 | 0.75 | 0.95 | 0.67 | Z=1.81 P=0.07, N.S |
| Signs and Symptoms | 0.85 | 0.75 | 1.15 | 0.51 | Z=0.80 P=0.44, N.S |
| Treatment of Pelvic Floor Dysfunction | 0.95 | 0.69 | 1.00 | 0.69 | Z=0.00 P=1.00, N.S |
| Pelvic floor muscle strength exercises | 1.45 | 0.83 | 2.10 | 0.57 | Z=1.29 P=0.19, N.S |
| **Total** | 4.70 | 2.49 | 6.30 | 1.82 | Z=1.70 P=0.08, N.S |

**N.S= Not significant**

**Table 3: Comparison of the pre and posttest level of pelvic floor muscle strength among women with Pelvic floor dysfunction in the experimental group**

N=20

| S.No. | Domains | Experimental Group | | | | Wilcoxon Signed rank test |
|---|---|---|---|---|---|---|
| | | Pre test | | Post test | | |
| | | Mean | SD | Mean | SD | |
| 1 | Power | 02.30 | 0.57 | 03.25 | 0.64 | Z=3.34 P=0.001*** |
| 2 | Endurance | 02.10 | 0.31 | 03.10 | 0.55 | Z=3.71 P=0.001*** |
| 3 | Repetitions | 01.70 | 0.47 | 03.15 | 0.67 | Z=3.84 P=0.001*** |
| 4 | Fast Contraction | 01.70 | 0.47 | 03.20 | 0.62 | Z=3.91 P=0.001*** |
| 5 | Every Contraction Timed | 01.75 | 1.16 | 02.90 | 0.55 | Z=2.89 P=0.001*** |
| | **Total** | 09.55 | 1.19 | 15.60 | 1.88 | Z=3.93 P=0.001*** |

**\*\*\* Very high significant at   P≤0.001**

**Table 4: Comparison of pre and post test level of pelvic floor muscle strength among women with Pelvic floor dysfunction in the control group**

N=20

| S.No. | Criteria | Control Group | | | | Wilcoxon Signed rank test |
|---|---|---|---|---|---|---|
| | | Pre test | | Post test | | |
| | | Mean | SD | Mean | SD | |
| 1 | Power | 02.05 | 0.51 | 2.15 | 0.49 | Z=1.00 P=0.37, N.S |
| 2 | Endurance | 02.15 | 0.59 | 2.20 | 0.62 | Z=0.57 P=0.56, N.S |
| 3 | Repetitions | 01.95 | 0.60 | 2.15 | 0.60 | Z=1.29 P=0.19, N.S |
| 4 | Fast Contraction | 01.80 | 0.62 | 1.95 | 0.60 | Z=1.08 P=0.27,N.S |
| 5 | Every Contraction Timed | 01.85 | 0.67 | 1.95 | 0.67 | Z=0.00 P=1.00, N.S |
| | **Total** | 09.80 | 2.02 | 10.40 | 1.74 | Z=1.22 P=0.22, N.S |

**N.S = Not significant**

**Table 5: Correlation of the mean differed level of knowledge with pelvic floor muscle strength among women with pelvic floor dysfunction between experimental and control groups.**

N=40

| Group | Variables | Mean difference | SD | Karl pearson correlation coefficient |
|---|---|---|---|---|
| Experimental | Knowledge | 13.00 | ±5.20 | r=0.51 p=0.01** |
| | Strength | 6.05 | ±2.37 | |
| Control | Knowledge | 1.60 | ±4.40 | r=0.19 p=0.22 , N.S |
| | Strength | 0.60 | ±1.72 | |

**\*\* High Significant at P≤0.01**
**N.S- Not Significant**

**Discussion**

The main focus of this study was to test the reliability and feasibility of the data collection tools and intervention tool and its acceptability and effectiveness in enhancing the understanding of the women, and to practice regularly to improve the pelvic floor muscle strength and encouraging them to incorporate the specified, simple strategy to reduce the risk of pelvic floor weakness. Prolapse was not prevalent in our population. The results indicated that tools used -structured interview schedule and modified Oxford grading scale are highly reliable and appropriate for assessing the knowledge and pelvic floor muscle strength respectively.

The pilot study also showed that the total enumeration technique that was used to select, the sampling technique based on the set inclusion and exclusion criteria were appropriate for sample selection. The method of administering the interventional package, the teaching methods selected and the proposed analytical measures were suitable for the study. The comparison within and between the groups showed that there was a statistical significance. The overall plan was effective, feasible and practicable to be applied in the main study.

**Conclusion**

The pilot study on the effectiveness of interventional package on pelvic floor muscle strength and knowledge among women in the selected villages revealed a high prevalence of pelvic floor dysfunction with urinary incontinence as a predominant problem among the women in the rural areas. The Data collection tools used were reliable, feasible and appropriate to be applied to the samples in the main study and the intervention package was effective in significantly improving the muscle strength among women with pelvic floor dysfunction. The study findings also showed that among the rural people, knowledge was poor and pelvic floor muscle strength was low. The findings also proved that community based nursing interventions are effective in improving the pelvic floor muscle strength and knowledge among women with pelvic floor dysfunction.

**References**

1.  Herschorn S. Female pelvic floor anatomy: the pelvic floor, supporting structures, and pelvic organs. Rev Urol [Internet]. 2004;6Suppl 5(3):S2–10. Available from: http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=1472875&tool=pmcentrez&rendertype=abstract

2.  Marques A, Stothers L, Macnab A.The status of pelvic floor muscle training for women. Can UroAssoc J. 2010;4(6):419-424.

3.  Ellen Braatz PT, Erin Alft PT. PELVIC FLOOR HEALTH FOR WOMEN [Internet].APOPS. Available from: http://www.pelvicorganprolapsesupport.org/pelvic-floor-health-for-women/

4.  Memon HU, Handa VL. Vaginal childbirth and pelvic floor disorders. Women's health (London, England). 2013;9(3):10.2217/whe.13.17. doi:10.2217/whe.13.17.

5.  S. Gene McNeeley. Pelvic Floor Disorders [Internet]. Merck Manuals Consumer Version. Available from: http://www.merckmanuals.com/home/women-s-health-issues/pelvic-floor-disorders/pelvic-floor-disorders

6.  Pomian A, Lisik W, Kosieradzki M, Barcz E. Obesity and pelvic floor disorders: A review of the literature. Med SciMonit [Internet]. 2016;22:1880–6. Available from: http://www.ncbi.nlm.nih.gov/pubmed/27255341\nhttp://www.ncbi.nlm.nih.gov/pubmed/27255341

7.  Bezerra KC, Neto JAV, Bezerra LRPS, Karbage SAL, Frota IPR, Vasconcelos CTM, et al. Health Promotion to Patients with Pelvic Floor Dysfunction : An Integrative Review. 2015;(March):155–62.

8. Bø K, Herbert RD. There is not yet strong evidence that exercise regimens other than pelvic floor muscle training can reduce stress urinary incontinence in women: A systematic review. J Physiother. 2013;59(3):159–68.

9. Pomian A, Lisik W, Kosieradzki M, Barcz E. Obesity and Pelvic Floor Disorders: A Review of the Literature. Medical Science Monitor : International Medical Journal of Experimental and Clinical Research. 2016;22:1880-1886. doi:10.12659/MSM.896331.

10. Redden T, Burgio KL, Richter HE, Alayne D, Carolina N, Hill C, et al. Prevalence and trends of symptomatic pelvic floor disorders in U.S. women. 2014;123(1):141–8.

11. Wallace H&, Luber KM, Boero S, Choe JY. Herman & Wallace White Paper Female Pelvic Floor Dysfunction 2010 to 2050. 2010

12. Krishna Rao B. Prevalence of Pelvic Floor Dysfunction among Married Women of Udupi Taluk, Karnataka, India. J Womens Heal Care [Internet]. 2015;04(03). Available from: http://www.omicsgroup.org/journals/prevalence-of-pelvic-floor-dysfunction-among-married-women-of-udupitaluk-karnataka-india-2167-0420-1000236.php?aid=54900