409

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ARE SYMPTOMS OF URINARY INCONTINENCE REDUCED IN PATIENTS WHEN THE MUSCLES OF THE PELVIC FLOOR ARE STRENGTHENED THROUGH PELVIC FLOOR MUSCLE (PFM) TRAINING? WHAT IS THE RELATIONSHIP BETWEEN SYMPTOMS AND STRENGTH?

Hypothesis/ aims of study
To determine whether or not symptoms of patients with urinary incontinence are reduced as pelvic floor muscle strength training is increased and to determine if there is a relationship between those symptoms and declining pelvic floor muscle strength.
Secondary purpose:
To determine whether or not urinary incontinence (UI) can be totally eliminated by strengthening the pelvic floor muscles to grade 5 on the Oxford scale.

Study design, materials and methods
Subjects with 176 incontinent women were selected among the individuals seen in urogynecology unit. The subject population in this study was a different symptomes including stress urinary incontinence (SUI, n=56) and mixed urinary incontinence (MUI, n=65). Twenty six patient excluded the study because of they had exclusion criteria. All patients were randomization to one of the following groups: Pelvic floor muscle training (PFMT) group (N=65) or control grup (CG) (N=65), and evaluated before and after 12 weeks intervention.
Data with regards to age, duration of urinary incontinence, number of pregnancies, type of delivery, waist/hip ratio, body mass index, heaviest new born weight at delivery were collected during the anamnesis at the initial approach. Urinary incontinence symptoms (Urogenital Distress Inventory (UDI-6), Incontinence Impact Questionnaire (IIQ-7), bladder diary, stop test, pad test) and strength measurements of pelvic floor muscle (PERFECT testing, perineometric measurement and Transabdominal (T-A) ultrasonography were performed by a physiotherapist (PT) and gynecologist. Different experienced physiotherapist was given pelvic floor muscle training (single blinded). The intervention was performed by the same physiotherapist during a period of 12 weeks in PFMT with participants attending three times a week, 30 min each session in first two weeks. Individual exercise schedules were designed according to PERFECT scheme data.

Results
Initially each group had 65 participants, but 9 women did not complete the study (drop-out rate 13.84 %). In the PFMT group, 5 women dropped out because of changes in her work situation, and the other 2 women dropped out because of other health problems. In the control group, 2 women dropped out because they disliked using the vaginal evaluation
The comparison of the groups revealed no significant differences at baseline for age, body mass index, waist/hip ratio, duration of urinary incontinence, number of pregnancies, type of delivery, heaviest new born weight at delivery, strength measurements of PFM, UDI-6, daytime urinary frequency, 24-hour frequency, 1-hour pad test and stop test ($P>0.05$). When compared with the control group, women who underwent PFM training had higher night time urinary frequency and lower IIQ-7 scores before intervention. The comparison of the groups revealed significant differences for all urinary incontinence symptoms (UDI-6, IIQ-7, bladder diary, stop test, pad test) and strength measurements of pelvic floor muscle (PERFECT testing, perineometric measurement and T-A ultrasonography after intervention. PFMT group values had higher than control group for all measurement parameters after 12 weeks (p=0.00).
Statistically significant differences between before and after intervention for PFMT group were noted for PERFECT testing;[(Power digital palpation; 2.50±0.65 - 4.36±0.87), (Endurance; 23.38±17.46 - 29.55±17.69), (Repetition; 8.40±3.87 - 17.97±6.24), (Fast; 8.43±3.58 -17.03±5.8)], perineometric measurement (9.81±2.81 - 20.32±15.49), T-A ultrasonography (4.47±3.82 - 10.44±6.51), IIQ-7 (12.36±6.26 - 5.31±4.34), UDI-6 (10.21±4.26 - 4.93±3.16), daytime urinary frequency (9.83±3.62 - 8.12±1.84), 24-hour frequency (1.95±2.88 - 0.33±1.15), night time urinary frequency (2.02±1.85 - 0.25±0.98), 1-hour pad test (5.07±5.87 - 1.47±4.28) and stop test (9.14±14.27 - 1.31±3.82)(P=0.00). In PFMT Group increases for strength measurements of pelvic floor muscle and decreases for all Urinary incontinence symptoms. In Control group between before and after intervention no statistically significant differences (p>0.05).
Of the participants in the program who reached a pelvic floor muscle strength of grade 5, all except one of them achieved a score of zero during a 'stop test'. After 12 weeks, pad tests of 1 gram were measured in only 4 cases, while in other cases the scores were zero. While incontinence was eliminated according to the bladder logs of almost all participants, only 2 cases continued. Although night-time urination was eliminated in virtually all subjects, only 2 people experienced single night-time urination. All the symptoms of urinary incontinence underwent significant changes, statistically speaking.

Interpretation of results
Women in this study achieved a mean % 83.07, % 71, % 85.6 reduction in frequency of UI, one hour pad test, stop test and improvements in % 57.03 IIQ-7, % 57 UDI-6 and % 74 power measurements, respectively
Literature has been published regarding investigations that have been conducted to determine the impact of PFM training on pelvic floor muscle strength and the amount of urine loss (1)**.** In these studies, to measure PFM strength, quality of life and symptoms, different and similar methods were used. In addition to urinary incontinence in different populations, UI's of different ages and various PFMT methods were utilized. However, the aforementioned studies did not investigate whether symptoms of urinary incontinence decrease as pelvic floor muscle training is increased; they only examined the relativity of differences in pre-treatment and post-treatment PFM strength, contrasts in training content and various groups. In general, these studies showed

that PFM strength training caused a reduction in symptoms and an increase in the quality of life. Our study resulted in similar conclusions. Very few studies have investigated the relationship between PFM training and symptoms. (2,3). These studies have generally examined the relationship between pre-treatment PFM strength and symptoms. They have only studied the correlation after treatment has been provided.

Concluding message

This study demonstrated that group PFM training are effective in reducing UI symptoms and increasing PFM strength in women with stress and mixed. PFM training, by increasing the strength of the PFM, decreases the symptoms of urinary incontinence. There is a relationship between symptoms and PFM training. However, more studies need to be conducted.

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