

Pelvic Physical Therapy Distance Journal Club

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Does a kegel exercise program prior to resistance training reduce the risk of stress urinary incontinence?
Cross D, Kirschaum MN, Wikander L, et al. Int J of Environ Res and Public Health 2023; 20(2):1481.
Doi:10.3390/ijerph20021481.

Introduction: Resistance training (RT) could be trigger for SUI, and potentially inhibit some women from exercising, and thus impact overall health and wellbeing. PFMT is established as gold standard as first-line treatment for SUI. Hypothesis of current study is that performing Kegel Exercise (KE) prior to RT would improve PFM strength and reduce odds of experiencing SUI during RT.

Aim/Primary Aim: Determine if a PFMT program prior to a RT program would result in reduction in SUI and an increase in PFM strength.

Study Design/Study Format: Comparative pre-post- intervention study.

Methods:

Resistance training group (RT) data from a prior foundational single cohort that investigated the impact of RT on 14 women over 18 years of age with SUI who had not previously performed PFME or RT
Kegel exercise (KE) +RT group data from 2 consecutive studies that included supervised and unsupervised PFME.

-These 19 subjects invited to join to complete 12 week RT program.

Outcome measures: All performed pre- and post-training after 12 weeks.

-**Incontinence Severity Index (ISI)**

-**Pelvic floor muscle strength assessment**

-**Perineometer (Peritron)** Measured 1) resting pressure, 2) average muscle strength 3) 80% maximum voluntary contraction (MVC) measurement for 20 seconds with cue "Squeeze and lift" and "hold."

-**Digital assessment by PT** assessed tone, atrophy, and contraction/relaxation of PFMs

-**Other:** RN measured HR, BP, height, weight, body composition analysis: fat mass, muscle mass, BMI

Intervention:

-All subjects met with pelvic PT before and after training for PF assessment.

-**RT program** one hour session in group class with trainer 2X/wk for 12.

-Coaches trained participants to breath and brace correctly using pebble analogy and inquired about SUI and pelvic health each session

-Data analyzed using IBM Statistical Package for Social Sciences (SPSS).

-Series of two-way ANOVAs performed with the α value set to 0.05 for statistical significance to analyze differences between the RT and KE+RT groups.

-**KE Training** specific program not discussed in this paper.

Results:

-24 participants completed study, aged between 27-62, average age 49.7 years.

-Final analysis based on comparable data collected from 9 subjects in RT group and 15 in the KE+RT group.

- Mean and effect size of variables between pre- and post- measurements of RT and KE+RE groups.(Table 2)

-Frequency of UI score on ISI, severity of UI score on ISI, and overall ISI scores all with significant large effect size from pre- to post tests for both RT and KE+RT groups. Large effect size is large=meaningful change

-When look at all 3 incontinence scores together total reduction larger in KE+RT group

-PFM average strength scores also with significant effect size from pre- to post-training with both RT and KE+RT

-Muscle mass kg with medium effect size in both RT and KE+RT groups

-Two-way ANOVA (Table 3) results of difference between RT group and KE+RT group

UI Symptom Change

-Total ISI and frequency of urine had statistical improvement from pre- to post training over time both groups statistically significant

-Improvement in frequency score from ISI, severity of symptoms from ISI, and overall ISI scores (UI symptoms) also had statistical improvement from pre- to post- training, but the results were not dependent on whether they did pelvic floor training or not. over time significant, but interaction between group and time was NOT significant, indicating these did not depend on whether pelvic floor exercises preceded the RT.

Pelvic Floor Muscle Change

-Average PFM strength increased over time, but interaction between group and time not significant although impact of time and effect of Kegel exercises preceding RT was statistically significant (both $p \leq 0.001$)

-MVC decreased over time in RT but increased over time in KE+RT, and interaction between group and time was significant: ability to sustain PF contraction/endurance better in the group that did KE first

-**A Pearson correlation** detected a statistically significant negative correlation between SUI and PFM strength: the stronger the PFM, the less UI there was.

Body Composition Change

-Statistically significant increase in muscle mass and decrease in fat mass observed over time but did not differ between groups.

-Statistically significant improvement in BMI and weight over time

-Pearson correlation determined statistically significant correlation between reduction in fat mass and increase in muscle mass, indicating strong inverse relationship between these factors

-No significant correlation found on analysis of relationship of PFMS and ISI when exploring changes.

-When considering results prior to intervention and after, relationship found to be insignificant.

Discussion:

-This study reported greater reduction in UI in KE+RT

-The RT only group however also had reduction in UI. During the RT sessions the subjects were cued for PF bracing prior to the lifting exercise activities.

greater improvement in PFM strength (MVC) in the KE+RT group and believed beginning with KE training helped to make the response more automatic when doing the RT program. However, when comparing pelvic floor average strength of 5 contractions, it did not make a difference.

-There was an unexpected response in RT only group with a reduction of maximal voluntary contraction (MCV) with post-test measurement. Authors suggest there may have been a fatigue effect related to the “strenuous” exercise, but that the KE+RT group had a “stronger PF muscle foundation.”

-The authors speculate that some of the improvements in PFMs in RT group related to 1) synergistic relationship with TrA. 2) Design of training with specific rest times allowing muscle recovery and bracing cues helped to avoid potential negative effects of IAP and/or 3) from indirect training of elevating the PFMs

Strengths

-Use of perineometer for strength measurement
-Unique approach not investigated in literature previously

Weaknesses:

-Small sample size
-No standard training between the multiple assessors for perineometry
-Use of subjects from prior study versus randomization
-Although supposedly a pelvic floor assessment was performed digitally by PT, no other information given on findings.
-Incontinence Severity Index not specific to SUI
-Appears that there were significant different starting points between the 2 groups: RT only group had lower score for total ISI score, but higher PF average and higher fat mass as compared to KE+RT
-No reporting of findings from digital exam performed by PT

Conclusion/Summary: Supervised, progressive RT can be performed by incontinent women without worsening symptoms if the training is done with supervision, cues for pelvic floor muscles, and given rest periods, and may be enhanced further if specific PFMT occurs prior to the RT.

Clinical Application

Consideration of pelvic floor training (even for short period) prior to advancing more strenuous lifting programs.

RT alone can potentially benefit pelvic floor muscle function and improve SUI symptoms if done in supervised setting with attention to pelvic floor response and appropriate rest times.

May reduce fear of RT if symptomatic

List discussion questions

- 1) Do you think that similar outcomes could have been achieved with less pelvic floor training sessions prior to the RT?
- 2) For those therapists who work with women who weight lift, do you cue for pelvic floor? If so, what cues do you use? Also do you find in lifting population a subset that has greater difficulty relaxing versus with weakness?

Other References:

- Virtuoso JF, Menezes EC, Mazo GZ. Effect of Weight Training with Pelvic Floor Muscle Training in Elderly Women with Urinary Incontinence. Res Q Exerc Sport. 2019 Jun;90(2):141-150. doi: 10.1080/02701367.2019.1571674. Epub 2019 Apr 4. PMID: 30945991.