Research Report

Comparing Resisted Hip Rotation With Pelvic Floor Muscle Training in Women With Stress Urinary Incontinence: A Pilot Study

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ABSTRACT

Objective: We aimed to compare the efficacy of resisted hip rotation (RHR) with that of pelvic floor muscle training (PFMT) as a conservative intervention for the treatment of women with stress urinary incontinence (SUI).

Study Design: This was a randomized clinical trial.

Background: Pelvic floor muscle training is well supported in the literature as an effective first-line intervention for women with SUI. A program incorporating RHR is currently promoted in continuing education courses as another effective intervention for this population. RHR has been observed in clinical use despite a lack of supporting literature.

Methods and Measures: Subjects were community-dwelling female volunteers with SUI. All were randomly assigned to either an RHR or PFMT exercise group. Each group exercised at home for 6 weeks, with weekly rechecks in a university setting. Outcome measures included leak frequency from a bladder diary, the Incontinence Impact Questionnaire, the Urogenital Distress Inventory, and subjective reports of improvement.

Results: Twenty-seven subjects completed the 6-week protocol, 12 in the RHR group and 15 in the PFMT group. Average subject age was 53.87 years (SD = 12.75 years). Both groups showed significant improvement across all outcome measures. There was a significant group-time interaction in reported leaks per week, suggesting that the RHR group had a slightly steeper improvement trajectory (R^2 = 0.073; P = 0.03). No other measures showed significant between-group differences or group-time interactions.

Conclusions: Both PFMT and RHR seem to be effective in the treatment of SUI. The present findings encourage further exploration of RHR in the treatment of SUI.

Key Words: Kegel, physical therapy, roll for control, women's health

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INTRODUCTION

The problem of urinary incontinence (UI) in women is widespread,[1-4] although it often seems to be undertreated.[3-5] Use of pelvic floor muscle training (PFMT) is well-supported as an effective first-line, conservative intervention for UI.[6-15] Historically, PFMT protocols have discouraged auxiliary muscle contractions such as gluteals, abdominals, and hip adductors.[16,17] With the known difficulty in accurately contracting the pelvic floor (PF),[16,18] the concern remains that allowing other muscle activity will detract from a proper contraction of the PF musculature.[19] However, clear evidence to support or refute this argument has not been reported.[9] Only a few published studies have explored the actual relationship between auxiliary muscle contractions and PF muscle activity. Bo and Stien[20] have reported PF muscle activity from gluteal and hip adductor contractions, whereas Sapsford and colleagues[21-23] have clearly demonstrated a relationship between transversus abdominis contractions and PF muscle activity. Underwood and colleagues[24] recently investigated the strength of hip musculature in women with stress urinary incontinence (SUI). They found significant weakness in the hip abductors of participants when compared with healthy controls.[24] Hip abduction has not historically been a focus of examination or treatment for patients with UI and was, in fact, used as a sham intervention by Ramsay and Thou[25] in another study of women with SUI. Those researchers could not explain the greater improvement seen on pad testing with this sham intervention.[25]

A clinical approach, known as *Beyond Kegels*,[26] has been developed by physical therapist Janet Hulme and uniquely incorporates hip exercises in the treatment of UI. This approach includes *Roll for Control* exercises, lifestyle changes, physiological quieting, inversion exercises, and occasional modalities. *Roll for Control* exercises feature active and resisted hip

movements as an intervention to strengthen the PF and treat UI without conscious attempts to contract the PF musculature.[26] This approach credits the activity of the obturator internus and its lateral connection to the levator ani with lifting the PF through resisted hip external rotation.[27] Contraction of hip adductors is also a component of this approach with expected overflow to the levator ani.[26,27] Hulme has taught her approach in the United States and abroad since 1992 to physical therapists, occupational therapists, medical doctors, urologists, nurses, and a variety of other health care professionals (phone interview with Janet Hulme, PT, December 2010). Hulme and colleagues presented this approach at the American Physical Therapy Association Combined Sections Meeting in 1999.[28,29] Original abstracts for these presentations are not readily accessible but are summarized in Hulme's *Beyond Kegels* text.[26] Hulme reports her approach to be more effective at resolving incontinence than Kegel exercises in patients with stress, urge, and mixed incontinence and reports resolution of symptoms in as little as 4 weeks.[26] Unfortunately, Hulme's text provides limited information on study design, statistical analysis, subject numbers, and levels of significance. Only one small peer-reviewed study has investigated a similar approach in adults with SUI.[30] That study, by Donahoe-Fillmore and colleagues,[30] investigated assisted PFMT, which included resisted hip rotation (RHR) but encouraged simultaneous PF contractions with all exercises. The authors found that both groups improved significantly when PF contractions were measured with surface electromyography, though no significant difference was seen in improvement between the groups.[30] Unfortunately, this study was limited by a very small sample of 6 subjects. The only other mention of this approach in peer-reviewed journals is found in *Pediatric Physical Therapy.*[31] That journal published a case study in 2008,[31] which successfully used a *Roll for Control* approach in addition to more traditional interventions including biofeedback and PF contractions for an 8-year-old patient with daytime UI.[31] The authors of this case study noted the relative ease of using hip musculature to activate the PF rather than teaching isolated PF contractions.[31]

This collection of preliminary evidence supports the need for further, more scientifically rigorous, investigation of Hulme's approach. The current trial does not explore every aspect of Hulme's *Beyond Kegels* protocol and will therefore use the term RHR to refer to the specific and unique maneuvers that have been introduced in her approach. The purpose of this study was to compare the efficacy of RHR with PFMT on leak frequency, perceived improvement, disease-specific quality of life (QOL), and exercise adherence. We chose not to provide any form of internal vaginal feedback with our interventions to allow this instruction to occur without specialized equipment or training in women's health physical therapy.

METHODS AND MEASURES

Subjects

The study was approved by the University of South Dakota's Office of Human Subjects Protection Institutional Review Board. Subjects were recruited via newspaper advertisements, posted fliers, and physician referrals in a rural university town. Advertisements requested participants currently suffering from urine leakage because of SUI and noted triggers such as coughing, sneezing, and jumping to take part in the study. All potential subjects were screened in person, by phone, or by e-mail by the primary investigator to ensure that inclusion and exclusion criteria were met (Table 1). Standardized questions[32] were used to identify the presence of SUI. With these questions, all accepted subjects confirmed their predominant problem as loss of urine with physical exertion such as coughing, lifting, sneezing, or laughing. Subjects were accepted if they reported additional symptoms of urge incontinence. This was described as having such an urge that made it impossible, at times, to get to the toilet without leaking. Subjects with only symptoms of urge incontinence were excluded from the study.

All subjects provided written consent and were randomly assigned to either the RHR or PFMT group. No control group was used because of the lack of documented spontaneous improvement, seen with this diagnosis.[7,10,12]

Procedures

Each subject met initially with a researcher to provide baseline data. At this baseline session, the Mini-Mental State Examination, a general health history, the Incontinence Impact Questionnaire (IIQ), and Urogenital Distress Inventory (UDI) were completed. All subjects were then provided with an initial 3-day bladder diary (BD). See the outcome measures section

Table 1. Inclusion and Exclusion Criteria

Inclusion	Exclusion
English speaking	Pregnant or <4 wks postpartum
Female	Mini-Mental State Examination <24/30
Age 18-88 yrs	History of total hip arthroplasty
Minimum of 2 stress incontinent episodes per month via self-report at screening	Current treatment for urinary incontinence
	Current medications known to impact bladder function

below for details on each instrument. Once subjects returned their 3-day BD, they received their exercise assignment and instructions for a 6-week course of exercise. Each subject was subsequently seen for 6 weekly rechecks throughout their exercise protocol. Two of these rechecks, week 2 and week 4, were conducted via phone. At each in-person weekly recheck, subjects returned their 3-day BD and exercise log, provided a subjective report, and practiced their assigned exercises with guidance from the researcher. Subjects were able to discuss their exercises and ask questions at these sessions. After the third and sixth weeks of exercise, the IIQ and UDI were readministered. During weeks with a phone recheck, subjects visited with a researcher and provided their subjective report. They were able to ask questions and discuss their progress or concerns with the assigned exercises. The BD and exercise log completed during phone recheck weeks were retained by subjects to turn in the following week. All sessions were led by the primary investigator, a physical therapist with more than 10 years of experience or by a Doctor of Physical Therapy student trained in the research protocol and supervised by the primary investigator. See Table 2 for the schedule of outcome measures collected.

Exercise Protocols

Exercise protocols were designed to be easily directed by a physical therapy generalist in a rural area without specialized women's health training or equipment. On the basis of the sensitive and personal nature of UI and the lack of anonymity found in small rural settings, the researchers hoped to improve subject recruitment and retention for this study by ensuring a hands-off approach without vaginal palpation.

Each group's exercises were structured to take approximately 5 minutes, twice each day. Exercise protocols were performed and timed by researchers during study design to assure that time spent exercising would not differ between groups. Both groups were instructed to perform their exercises in an upright seated posture with their feet on the floor. This posture was chosen on the basis of recommendations for sitting in the *Roll for Control*[26] protocol as well as evidence that suggests the PF musculature is more active in a tall sitting posture.[33] Thus, subjects were cautioned to avoid slouching and were encouraged to maintain an active, upright sitting posture for exercise performance.

Subjects in the PFMT group were directed in an isolated PF muscle contraction. They were instructed to perform (1) 1 set of 20 repetitions with 5-second holds and 5-second rests between each hold and (2) 1 set of 20 quick flicks holding 1 to 2 seconds. The cues given were to contract the PF musculature with a squeeze and lift, up and in as if attempting to stop the flow of urine midstream. Individualized verbal cues were provided with additional explanation as needed. All subjects in the PFMT group were told that PFM contractions are often performed incorrectly. Thus, careful instruction was provided in avoidance of bearing down, pushing, not breathing, straining, contracting accessory muscles, or not relaxing between repetitions. Subjects were encouraged to practice stopping the flow of urine when on the toilet before the first attempt of this exercise protocol for the purposes of finding and feeling the PF muscles. Subjects were reminded that the exercises were not to be practiced on the toilet and that stopping midstream was to be used only for initial identification or later verification of correct muscle engagement. Subjects requiring additional cues were given suggestions such as inserting their finger into the vagina and squeezing during a PF muscle contraction. To maintain our attempt of a modest and generalized approach, no visual PF inspection, biofeedback, or internal palpation was provided. External palpation to identify accessory muscle substitution was performed as needed.

The RHR group performed (1) hip external and internal rotation with diaphragmatic breathing for 10 breaths, (2) 10 repetitions of hip external rotation with a green resistance band holding 5 seconds and resting 5 seconds, and (3) 10 repetitions of hip internal rotation/adduction, squeezing a 9″ soft inflatable ball

Table 2. Schedule of Outcome Measures

	Sessions (Each ~1 wk Apart)						
		6 wks of Exercise Protocol					
Outcome Measures	Baseline	1	2[a]	3	4[a]	5	6
Bladder diary (3 d)	X	X	X	X	X	X	X
Exercise log		X	X	X	X	X	X
Subjective report		X	X	X	X	X	X
Incontinence Impact Questionnaire	X			X			X
Urogenital Distress Inventory	X			X			X

[a]Phone recheck.

for 5 seconds, with 5-second rest. With hip external rotation, subjects were instructed to roll their knees out against the band, not more than shoulder width apart with feet flat and forming a V position, heels touching and toes pointed outward. When performing hip internal rotation, subjects were instructed to squeeze the ball by rolling their knees inward and touching their toes together while sliding their heels apart. The same foot positions were used with the initial hip external and internal rotation while breathing diaphragmatically.

In both groups, subjects were provided with individualized strategies and explanation as needed, both at their initial session and at recheck sessions, to successfully perform their assigned exercises. Education on PF anatomy varied on the basis of subject understanding and awareness. All exercise sets were to be performed twice daily, once early in the day and once late in the day. See Table 3 for details regarding each exercise protocol.

All subjects were informed that the exercises were not to cause any discomfort. Subjects who found it difficult to complete all repetitions of any given set of exercises were encouraged to do as much as they could and work toward fully completing the sets as prescribed. Both groups received basic bladder health information including the importance of hydration, avoiding caffeine,[34,35] risks associated with constipation,[36] and normal voiding frequency.[37,38]

Outcome Measures

Three-Day BD

The 3-day BD is a well-supported tool for evaluating the efficacy of treatment for UI.[39-41] A BD was collected as a record for documenting leak frequency. The day and time of all leaks were recorded by subjects for 3 days of each week of the study. Subjects were encouraged to complete the BD on days that were typical for their activities and schedule. The BD was completed at baseline and each week of the study.

Table 3. Exercise Protocols Performed Twice Daily (Seated)

Pelvic Floor Muscle Training	Resisted Hip Rotation
Long holds 20 repetitions 5-s hold 5-s rest	Hip ER with toes out (breathing in) Hip IR with toes in (breathing out) With diaphragmatic breathing 10 repetitions per breath
Quick flicks 20 repetitions 1- to 2-s holds	Hip ER with a green resistance band, toes out 10 repetitions 5-s hold 5-s rest Hip IR/adduction with a 9" ball, toes in 10 repetitions 5-s hold 5-s rest
Abbreviations: ER, external rotation; IR, internal rotation.	

Incontinence Impact Questionnaire/Urogenital Distress Inventory

Disease-specific QOL was measured using tools specific to incontinence in women, the IIQ and UDI. The IIQ[42] is a 30-item questionnaire that measures disease-specific QOL across 4 domains including physical, travel, social relationships, and emotional health. The UDI[42] addresses 19 symptoms and the amount of distress the respondent feels related to any that are present. The tools were developed to be used together[42] and have demonstrated sound psychometric properties.[42-45] The IIQ seems to have emerged as the more commonly used tool.[45-47] Both measures were given at baseline, week 3, and week 6 of the exercise intervention. These measures were collected less frequently because of their length and lack of significant gains expected on a week-to-week basis.

Subjective Improvement

Each week, subjects were asked about their perceived improvement. They were given 3 choices: (1) worsening, (2) staying the same, or (3) improving. If they reported improvement, they were asked to rate this on a scale from 0% to 100%, with 0 being no improvement and 100% being complete resolution of their incontinence. Although this is not a standardized clinical outcome, we included it in our weekly rechecks to determine more immediately our subject's perceived level of improvement.

Exercise Compliance

Exercise logs were provided to subjects in each group. These logs included a list of their assigned exercises with empty boxes for each exercise set and reminders of hold times and repetitions required. Subjects were asked to mark each completed set and to leave blank any set that was not performed completely. A section of the log was left open for comments or questions. Compliance was calculated as a percentile of actual exercise sets marked complete from total sets possible for a given week.

Data Analysis

Data were analyzed using SAS 9.3 (SAS Institute, Inc, Cary, North Carolina) with alpha set at 0.05. Baseline outcome measures were analyzed for similarity with *t* tests and are shown in Table 4. Group similarities in health history are also shown in Table 4. A repeated-measures analysis of variance (ANOVA) was used to compare within- and between-group differences on outcome trends from baseline through week 6. Exercise compliance was analyzed with an ANOVA to determine any difference between group compliance.

Table 4. Baseline Group Comparisons[a]

	RHR, N = 12	PFMT, N = 15	
	Mean (SD)	Mean (SD)	*P*
Age	52.8 (12.8)	50.4 (12.7)	0.62[b,c]
UDI	142.3 (69.8)	145.2 (54.0)	0.91[d]
IIQ	151.3 (77.2)	140.7 (69.4)	0.71[d]
Leaks per week[e]	5.22 (6.18)	3.27 (3.53)	0.33[d]
Health History	**RHR, N = 12 Frequency**	**PFMT, N = 15 Frequency**	
Appendectomy	1	1	
Cesarean delivery	0	1	
Cholecystectomy	4	1	
Colon resection	1	0	
Endometriosis			
Hysterectomy	1	2	
Mixed urinary incontinence	6	10	
Multiple sclerosis	1	0	
Prolapse	0	0	
Tubal ligation	1	1	
Type 2 diabetes mellitus controlled with medication	1	2	

Abbreviations: IIQ, Incontinence Impact Questionnaire; PFMT, pelvic floor muscle training; RHR, resisted hip rotation; UDI, Urogenital Distress Inventory; SD, standard deviation.
[a] $P > 0.05$.
[b] Analysis of variance.
[c] $R^2 = 0.01$.
[d] *t* test.
[e] Collected weekly from 3-day bladder diary.

RESULTS

Demographics

A total of 30 women satisfied all inclusion and exclusion criteria and were randomly assigned to 1 of the 2 groups. Twelve subjects completed the RHR protocol, whereas 15 completed the PFMT protocol. Three subjects dropped out (RHR = 2; PFMT = 1). One subject dropped out after session 2, reporting an unassociated injury related to a fall. Two subjects dropped out reporting they did not have time to complete the exercise protocols as requested. Only complete, 6-week subject data were included in the data analysis. Average age of enrolled subjects was 53.87 years (standard deviation = 12.75 years), with no significant difference between groups by subject age (see Table 4). All subjects reported a history of at least 1 year of SUI symptoms that were not improving. No subjects were currently being treated for UI symptoms, and all characterized their current status as "not changing" or "worsening" at the start of the study. Subjects were not randomized by parity; however, no subjects were pregnant and none had given birth in the previous 12 months. In the PFMT group, 10 of 15 (67%) subjects reported symptoms of mixed UI, at initial screening, whereas 6 of 12 (50%) reported mixed symptoms in the RHR group (Table 4). We did not randomize subjects on the basis of this or other medical history because of our limited sample size. Additional demographic and health history information can be found in Table 4. We did include 1 subject in the RHR group with a self-reported diagnosis of multiple sclerosis because our exclusion criteria did not require her removal. This subject was able to participate in the study without difficulty. Chi-square tests demonstrated no significant between-group differences in outcome measures or health history at baseline.

Compliance

An ANOVA indicated no significant difference in average exercise compliance between the RHR (mean = 89% compliance) and PFMT (mean = 86% compliance) groups ($P = 0.56$). We further analyzed this difference with a binomial test and found similar results ($P = 0.35$).

Subjective Improvement

Both groups made significant improvement in their subjective report of UI symptoms ($P < 0.0001$). However, there was no significant between-group difference in subjective improvement ($P = 0.24$). We also observed no time by group interaction for this variable ($P = 0.25$) (Table 5).

UDI Scores

Both groups achieved statistically significant improvement in UDI scores ($P < 0.001$) over the 6 weeks of the study. However, between-group differences were nonsignificant ($P = 0.95$). Repeated-measures ANOVAs showed no significant interaction between group membership and UDI scores over time, demonstrating improvement in both groups on this outcome measure in parallel trajectories ($P = 0.90$) (Table 5).

IIQ Scores

Similar to UDI scores, there was significant improvement across both groups ($P < 0.001$). Between-group differences were nonsignificant ($P = 0.81$), and no significant interaction between group membership and IIQ scores was observed over time ($P = 0.70$) (Table 5). Again, both groups improved significantly and on parallel improvement trajectories.

Leak Frequency

The results of this test are depicted in the Figure. Across groups, participants improved significantly over time ($P < 0.001$). Between-group mean

Table 5. Results Summary

	RHR			PFMT				
	Baseline	Wk 6	Within-Group Difference[a]	Baseline	Wk 6	Within-Group Difference[a]	Between-Group Difference	Group-Time Interaction
	Mean (SD)	Mean (SD)	*P*	Mean (SD)	Mean (SD)	*P*	*P*	*P*
UDI	142.3 (69.8)	79.8 (56.6)	0.02[b]	145.2 (54.0)	77.7 (60.4)	<0.01[b]	0.95	0.90
IIQ	151.3 (77.2)	122.5 (68.2)	0.03[b]	140.7 (39.4)	119.8 (59.6)	<0.01[b]	0.81	0.70
Subjective improvement,[c] %	0 (0)	69.6 (21.4)	<0.01[b]	0 (0)	52.8 (32.2)	<0.01[b]	0.24	0.25
Leaks per week[d]	5.22 (6.18)	0.11 (0.13)	<0.01[b]	3.27 (3.53)	1.13 (3.44)	<0.01[b]	0.48	0.03[b]

Abbreviations: IIQ, Incontinence Impact Questionnaire; PFMT, pelvic floor muscle training; RHR, resisted hip rotation; SD, standard deviation; UDI, Urogenital Distress Inventory.
[a]Repeated-measures analysis of variance across weeks.
[b]Statistical significance ($P < 0.05$).
[c]0% to 100% weekly improvement rated by the participant.
[d]Collected weekly from 3-day bladder diary.

differences aggregated across time were again nonsignificant ($P = 0.48$). In this case, however, there was a significant interaction between group membership and improvement over time ($P = 0.03$; $R^2 = 0.073$) indicating a significantly steeper ($P = 0.03$) improvement trajectory in the RHR group than the PFMT group. To ensure that there was not a significant difference in leak frequency at baseline, we used a Ryan-Einot-Gabriel-Welsh post hoc test and found no significant difference between groups ($P = 0.33$) with a "small" to "medium" effect size (Cohen's $d = 0.42$).

COMMENT

To our knowledge, this is the first study examining resisted hip movements as a stand-alone intervention for SUI. Our findings suggest that PFMT and RHR are effective and may be equally effective when applied in this conservative manner. These findings are supported by literature detailing PF activity with auxiliary muscle contractions.[20-23] However, at this time we still do not know the mechanism by which these exercises allow functional improvement. The resisted

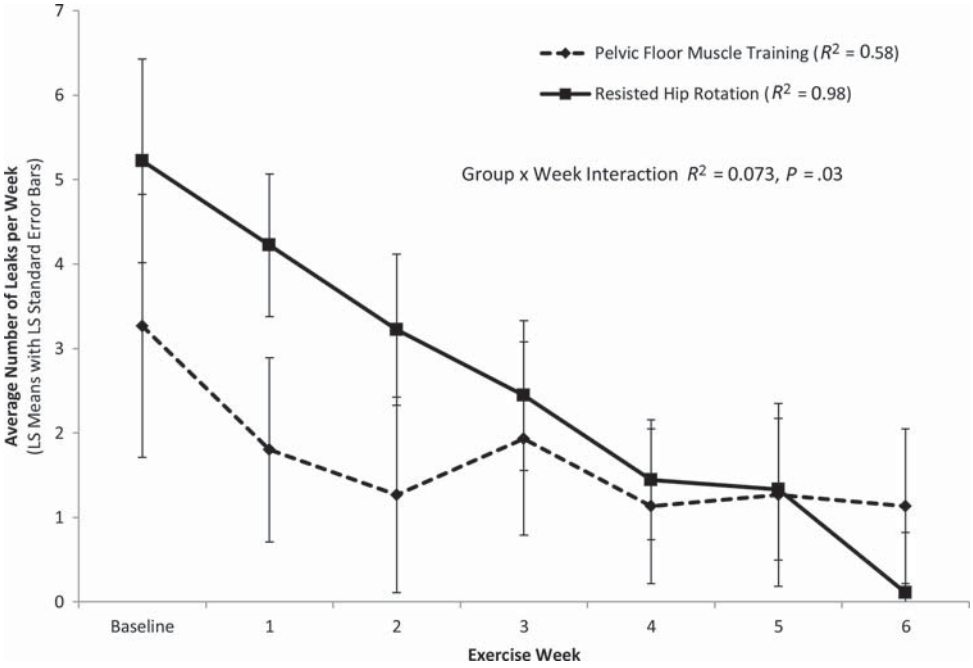

Figure. The average number of leaks per weak in each group as reported in their bladder diaries. Both groups improved significantly ($P < 0.001$). A significant group-week interaction is seen with the resisted hip rotation group showing a greater reduction in leaks.

hip movements used in this study were categorized as rotation in an attempt to closely mimic the exercises promoted in the *Beyond Kegels* program.[26] The recent findings of hip abductor weakness in women with SUI[28] and the unexpected improvement seen in women performing hip abduction exercises[25] lead us to question whether RHR exercises might encourage more activity from hip abductors than from true hip rotators. This question will certainly require investigation in the future, but is beyond the scope of the current study.

The RHR approach may be considered a starting point for those women who find PF muscle contractions difficult to perform. With a lack of women's health specialists nationwide[48] and 9 states reporting no certified specialists,[49] physical therapy generalists may find this basic, first-line intervention more feasible. In addition, physical therapist education programs are now encouraged to include more information related to women's health.[50] The RHR approach may be well-suited to students and newly trained practitioners before their opportunities to specialize in women's health. This approach may decrease barriers perceived by practitioners and patients alike because of the traditional appearance of the exercises and lack of vaginal palpation required.

By broadening a first-line conservative approach, more patients may ultimately find the assistance they require, even if further care from a specialist is ultimately necessary. Increasing the ease of treatment initiation could assist the substantial problem UI presents to our society.

The contrast of these exercises with current protocols to avoid auxiliary contractions creates an abundance of further research questions. Future research should explore the strength and activity of the PF and surrounding musculature with RHR exercises. Impact on additional populations including varied age groups, men, postpartum women, and athletes should also be considered. Larger sample sizes and study replication are also encouraged to support the current findings.

Limitations

Our study was limited by a small sample size and a large range of participant ages, making it difficult to generalize these findings to one particular patient population. Because of our small sample, subjects were not randomized or matched for demographic or health information. We included 1 subject with multiple sclerosis and 3 subjects with type 2 diabetes mellitus, controlled with medication. We did not collect or code details such as race, education level, parity, menopause status, or symptom severity. Each of these variables could influence results and should be considered in future studies.

Our subjects self-reported symptoms of SUI on the basis of standard questions[32] but did not undergo urodynamic testing or other physical evaluations to support this diagnosis. Furthermore, we did not exclude subjects with symptoms of mixed incontinence. Although this may be most representative of a true clinical population, it could have limited the outcomes of some participants as PFMT interventions are proven to work best for SUI.[8]

Outcome measures were subjective in nature and depended on patient response. Although the UDI, IIQ, and 3-day BD have been psychometrically tested for this population, our subjective report of improvement and exercise log were developed for this study and have not been validated as standard outcome measures. Therefore our results for subjective improvement and exercise compliance should be viewed cautiously.

Our chosen protocol for RHR is not identical to the one promoted by Janet Hulme, as the *Beyond Kegels* program includes more options for clinical variability.[26] We chose to target the most basic aspects of active and RHR from this program as this seems to be the most unique element and promotes an approach with no active attention to the PF musculature. This allowed more direct comparison with PFMT with fewer confounding variables. Generalizing our results to a more comprehensive *Beyond Kegels* protocol is discouraged. Similarly, it was difficult to choose a PFMT protocol consistent with other studies as these are known to vary widely in the literature.[9,15,51] Variance in outcomes could occur with different PFMT protocols.

In addition to varied protocols, subjects were directed with only verbal and external cues. Our decision to withhold digital vaginal feedback and biofeedback may have limited the accuracy of PF muscle contractions and the potential improvement of some subjects in both groups. Studies comparing biofeedback[13,52,53] to basic PFMT show limited additional benefits in first-line care, though feedback through vaginal palpation is supported as more effective for successful PFMT.[54] Subjects in each group may have responded further to more hands-on and individualized physical therapy intervention as can be found in specialized women's health physical therapy settings. The researchers feel this limitation is also a clinical barrier for rural, general physical therapy settings as many practitioners lack the skill or equipment to provide such feedback in their clinical environment. Study replication with vaginal feedback is encouraged to more clearly depict actual PF muscle activity with both protocols.

All subjects were limited to two 5-minute exercise sessions per day in an attempt to standardize the time investment and to achieve consistent levels of program adherence between groups. Clinically, we may find that some patients require more frequent or extended exercise sessions to achieve their desired outcome.

The group–week interaction seen in relation to leak frequency should be viewed cautiously. Although leak frequencies were not significantly different between the groups at baseline, they did differ to some degree. The higher leak frequency seen at baseline in the RHR group could have allowed the potential for a greater reduction in leaks with any intervention. In addition, the overall findings suggest a significant and very similar overall impact from both interventions.

CONCLUSIONS

We conclude that RHR-type exercises do improve disease-specific QOL, decrease the frequency of incontinent episodes, and result in perceived symptom improvement in women with SUI. It seems that these outcomes are at least as beneficial as those seen with a traditional PFMT approach.

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