Virtual Reality Rehabilitation as a Treatment Approach for Older Women With Mixed Urinary Incontinence: A Feasibility Study

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Introduction: Adherence to a regular PFM exercise program is key to its initial effectiveness. Despite the low level of difficulty, non-invasiveness, and efficacy of PFM training, there are high attrition rates, and low adherence well documented in both clinical and research settings; as a result, adherence has been identified as an influential short- and long-term predictor of PFM exercise effectiveness.

Aim/Primary Aim: To determine if functional training by virtual reality rehabilitation (VRR) combined with PFM contraction training is a feasible treatment approach with older women with MUI. Also, to evaluate effectiveness of the PFM/VRR program at improving quality of life and increasing patient satisfaction.

Study Design/Study Format:
- Quasi-experimental pre-test, post-test pilot study
    - Oxford Centre for Evidence Grading Scale: IIb
- Subjects:
    - Community-dwelling women over age 65
    - No randomization, all participated in intervention
    - Twenty-four women participated in the study and had the following means: age 70.5 years, body mass index of 25.9 kg/m^2, hysterectomy 0.7 and pregnancy 1.7, including 1.3 vaginal deliveries and 0.1 Caesarean sections.
    - No significant difference in the group between the two pre-intervention evaluations for the 72-hr urinary diary (mean voiding, leakage, and pads per day) nor in the UDI-6, IIQ, and ICIQ- UI scores.
    - Exclusion criteria: chronic constipation, a pelvic organ prolapse of grade II or more according to POP-Q scale, or perineal pain; were taking medication known to affect continence; or had mobility, medical or psychological problems that would interfere with the physical assessment or the PFM exercise program

Methods:
- Each woman participated in two pre-intervention evaluations (pre-1 & pre-2), which consisted of an interview using the same three questionnaires (UDI-6, the IIQ and the ICIQ-UI), 72 hr pad urinary diary, and a modified 1-hr pad test. This was followed by a 12-week PFM/VRR training program and one post-intervention evaluation (post).
- Outcome measures:
    - UDI-6, the IIQ and the ICIQ-UI
    - Satisfaction with treatment rated on visual analogue scale and a questionnaire
    - Perception of Improvement at the end of the intervention period measured using an Estimated Percent Improvement (EPI) question

- o   Modified 1-hr pad test (see appendix II in article for description of test)
- o   72-hr (3-day) bladder diary
- Blinding:
  - o   Subjects: No
  - o   Treating Therapists: No
  - o   Assessors: No
- Interventions:
  - o   12-weeks, once weekly 60-min exercise class supervised by an experience physiotherapist, delivered in groups of 8
  - o   Each session included a 10-min education period, a 30-min session of static PFM and deep abdominal (transverse abdominis [TrA]) training.
  - o   Sessions ended with a 20-min VRR training using a dance game, StepMania (www.stepmania.com) with dynamic PFM training.
  - o   Participants were given a 20-min static PFM home exercise program, 5 days per week. A weekly exercise diary was provided to each participant in which to record their home exercise participation.

Results:
- Minimum clinically important difference (MCID) was reached for each of the responsiveness outcomes between the pre-2 and post evaluations.
  - o   Mean UI episodes showed a 58.0% reduction
  - o   UDI-6 score showed a 22-point decrease
  - o   IIQ score showed a 34-point decrease.
  - o   ICIQ-UI showed a five-point reduction in the ICIQ-UI score
  - o   Pad test showed an 85% reduction
- Dropout rate: 4% is acceptable to prevent bias
- Satisfaction VAS outcome: mean appreciation score of the VRR component in the training program was 9.8/10 (0.5).
- Satisfaction outcome: 91.0% of the participants were satisfied with the overall PFM/VRR training program and would not seek additional treatment.

Discussion:
- This study demonstrated that women aged 65 and over, with MUI, are good candidates for a PFM/VRR training program and are capable of complying with study demands, as demonstrated by the high participation and low attrition rates.
  - o   It is possible that the VRR component helped participants to develop their ability to contract their PFMs during physical activities.
  - o   Potential beneficial effect in terms of improved executive functions and dual-tasking.
  - o   Except for the average pads used in the 72-hr urinary diary, there was a significant improvement for all UI and QoL outcomes in the post evaluations as compared to both the pre-1 and the pre-2 evaluations (Table I).
- Limitations:
  - o   Sample size: limited, did not include a control group; hence, the clinical applications of this study are limited.
  - o   1-hr pad measurement: the quantity of urinary leakage should be measured by a 24-hr pad test to eliminate the lengthy and difficult process of bladder filling engendered by the 1-hr test.

- o Self-efficacy measure: the PFM/VRR training program could have impacted confidence with its functional component. The authors may wish to include a self-efficacy outcome measures in future studies.
- o Long term follow up: it would be beneficial to evaluate whether the treatment effects of PFM/VRR training programs can be sustained over time.

Conclusion/Summary: A combined PFM/VRR is an acceptable functional training approach for older women with MUI. Not only is it effective in reducing UI symptoms and in enhancing QoL, but has a high level of patient satisfaction.

Clinical Application:
- How have you used virtual reality with your patients? What were the outcomes?
- Could the home exercises alone have created the improvement? Would you say this is a limitation of the study?
- Would having the aspect of the added fitness through the functional training be more enticing to our populations?

Other References: N/A