Unleashing Women’s Power in Second Life: The Development of a Virtual Weight Management Program for Women with Mobility Impairments

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Abstract
Design: Interrupted time series quasi-experimental
Setting: Weight management program conducted in Second Life (SL), a free, online virtual world.
Participants: 13 women completed the pilot weight management intervention program.
Intervention: We adapted the Diabetes Prevention Program (DPP) with input from a team of researchers and a national community advisory board (CAB) of women with mobility limitations (ML). The DPP was modified to address the unique needs of women with ML. The program consisted of 16 weekly sessions for 2 hours with women meeting in SL using their avatars. Strategies included daily recording of physical activity and food intake, action planning with weekly review, and group discussion.
Main Outcome Measures: Weight, waist circumference, self-reported physical activity and energy intake.
Results: Thirteen participants attended at least half of the GoWoman sessions. Nine lost weight (0.5-17.7 pounds), and eight reduced their waist circumference (1-5 inches). There was a significant increase in physical activity and a significant reduction in energy intake. Feedback was highly positive for the program and for group interactions in SL.
Conclusions: The online program resulted in real life changes in both diet and physical activity with moderate weight loss in women with mobility limitations.

Study Objectives
Objective 1: Adapt a face-to-face, evidence-based weight loss program for adults into an internet – based virtual reality weight loss intervention that responds to the specific needs of women with ML.

Objective 2: Pilot the Internet-based weight management intervention, GoWoman.

Objective 1: GoWoman Program Development
Partnering with Community Members: Community Advisory Board (CAB)
• Five women, ranging in age, race/ethnicity, region of the US, and disability type
• Held two initial focus group meetings
• Met monthly to provide input on all aspects of the program: content, materials, activities, and training programs and materials on how to use MyFitnessPal.com and navigate in Second Life
• Served as Beta-testers of the 16-week program in SL
• Met monthly after the beta test to help further revise and provide input on the program
• Assisted with dissemination

Modifications to the Diabetes Prevention Program (DPP):
• Delivered online in Second Life so women can participate from their homes
• Greater emphasis on psychosocial factors related to disabilities and weight management
• More disability-relevant content: relation between disability and weight gain, adapted cooking, safety precautions, disability-related stress and examples of the life situation of women with ML
• Modified physical activity recommendations and range of physical activities discussed
• Added ways to track weight loss progress for those who couldn’t weigh themselves at home
• MyFitnessPal, an app and computer program was used for daily tracking and recording of diet and physical activity
• Removed information about diabetes
• Removed clip-art images of able-bodied people and added pictures of women with ML
• More flexibility in allowing women to set their own weight loss goals

Creation of Second Life Island:
• Free 3D online world
• Anonymous (don’t need to use your real names)
• Disability features (e.g., wheelchairs, ramps)
• Educational features (e.g., PowerPoint presentations with games, information, videos)
• Different meeting locations with PowerPoint display boards

Background
• More than 70% of people with disabilities exceed the healthy weight range.
• Women with disabilities are more likely to be obese than men.
• No weight loss programs are publicly available for disabled populations despite calls for such programs.

Objective 2: Pilot Test - Study Design
Interrupted time series quasi-experimental design with three assessments: Pre-test 1, Pre-test 2 (2 months later), and Post-test Weekly session feedback using Survey Monkey
Post-intervention evaluation using Survey Monkey

Sample
Age: Mean=49.62 years (8.5), range 23-59
Race/Ethnicity: White/non-Hispanic, 69%; Black, 23%; Hispanic, 8%
Education: HS/GED, 31%; some college, 23%; college degree, 46%
Disability Type: MS (n=2); Back injury/problem (n=2); 1 each CP, SCI, Spina Bifida, Post-Polio, Osteoarthritis
Dis. Duration: Mean=21.8 years (16.9), range 2.4-58

Primary Outcomes:

<table>
<thead>
<tr>
<th>BMI</th>
<th>Waist Circumference</th>
<th>Weight</th>
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<tbody>
<tr>
<td>34</td>
<td>190</td>
<td>180</td>
</tr>
<tr>
<td>32</td>
<td>190</td>
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<td>30</td>
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Physical Activity

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<th>Energy Intake</th>
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<th>1000</th>
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<tr>
<td>0</td>
<td>6.85</td>
<td>3.26</td>
</tr>
<tr>
<td>100</td>
<td>6.85</td>
<td>3.26</td>
</tr>
<tr>
<td>200</td>
<td>6.85</td>
<td>3.26</td>
</tr>
<tr>
<td>300</td>
<td>6.85</td>
<td>3.26</td>
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</table>

Secondary Outcomes

<table>
<thead>
<tr>
<th>Outcome Variable</th>
<th>Pretest 2 Mean (SD)</th>
<th>Posttest Mean (SD)</th>
<th>ES</th>
<th>Size</th>
<th>p 1-tail</th>
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</thead>
<tbody>
<tr>
<td>Nutrition Knowledge</td>
<td>16.46 (2.60)</td>
<td>16.92 (2.87)</td>
<td>0.14</td>
<td>None</td>
<td>0.305</td>
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<tr>
<td>Self-efficacy: Healthy Eating</td>
<td>37.46 (15.90)</td>
<td>49.08 (19.39)</td>
<td>0.63</td>
<td>Med</td>
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<tr>
<td>Self-efficacy: Physical Activity</td>
<td>15.38 (5.45)</td>
<td>16.15 (4.79)</td>
<td>0.54</td>
<td>Med</td>
<td>0.040</td>
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<td>Barriers to Exercise</td>
<td>56.38 (15.00)</td>
<td>51.92 (11.92)</td>
<td>0.38</td>
<td>Small</td>
<td>0.101</td>
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<tr>
<td>Support for Healthy Eating: Friends</td>
<td>7.15 (2.12)</td>
<td>6.54 (1.71)</td>
<td>0.24</td>
<td>Small</td>
<td>0.205</td>
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<tr>
<td>Support for Physical Activity: Family</td>
<td>7.23 (2.86)</td>
<td>8.46 (3.26)</td>
<td>0.41</td>
<td>Small</td>
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<td>Support for Physical Activity: Friends</td>
<td>4.92 (2.40)</td>
<td>6.85 (3.47)</td>
<td>0.47</td>
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<td>0.059</td>
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</table>

Summary and Discussion
Women who attended at least half of the GoWoman sessions lost an average of 3% of their body weight and 1.4 inches off their waist.

The program was highly rated by study participants.

SL and other online platforms may be a promising new way to offer health promotion programs to people with ML who have a great need for such accessible programming.

The online GoWoman program offer promise for helping women with ML improve their diet and physical activity and lose weight.

References

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