A Virtual-Reality Weight Loss Program for Women with Mobility Limitations: Results of a Pilot Study

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Abstract

Research Objective: To develop and pilot test a weight management intervention designed to meet the unique needs of women with mobility limitations (ML).
Design: Interrupted time series quasi-experimental design
Setting: Intervention conducted in Second Life (SL).
• Free, publically available, 3-D immersive virtual world
• Circumvents many of the geographic, transportation, logistic, physical, and personal barriers to traditional weight loss programs faced by women with ML.
Participants: Thirty women with disabling conditions affecting mobility completed the pilot weight management intervention program.
Intervention: We adapted the Diabetes Prevention Program with input from an interdisciplinary team of professionals and a national community advisory board (CAB) of women with ML. The program, GoWoman, was modified to address the unique needs of women with ML. The program consisted of 16 weekly sessions with women meeting in SL as their avatars. Led by two facilitators, sessions were 2 hours long. Strategies included daily food and activity tracking using MyFitnessPal.com, action planning, and group debriefing, and group discussion.
Main Outcome Measures: Weight, waist circumference, self-reported physical activity (PASSID) and energy intake (ASA-24), participant post-intervention weight loss.
Results: Thirty participants attended 50% or more GoWomen sessions. Nine participants lost weight (0.5-17.7 pounds), and eight reduced their waist circumference (1.5 inches). There was a significant increase in average physical activity, and the average reduction in energy intake was 243 kcal/day (potentially 20-25 pounds/year). Post-intervention participant evaluation was highly positive for the program and for group interactions in SL.
Conclusions: Facilitated group interaction and support using action planning, combined with unique features of Second Life, can encourage real life changes in both diet and physical activity with moderate weight loss in women with mobility limitations.

Introduction

• More than 70% of people with disabilities exceed the healthy weight range1
• Women with disabilities are more likely to be obese than men2
• No weight loss programs are publically available for disabled populations despite calls for such1

Cycle of Disability and Weight Gain

Study Design

Development of the GoWoman Program
• CAB Input: The CAB compiled a self-referral team all 3 years of the grant through initial focus group meetings followed by monthly meetings.
• Beta Test: The CAB compiled 16-session beta test of the GoWoman program providing feedback after each session and comprehensive review after the program.

Pilot Test of the GoWoman Program
• Three assessments:
  - Pre-test 1
  - Pre-test 2 (2 months later)
  - Post-test with Program Evaluation
• Weekly session feedback (using Survey Monkey online surveys)

Measures

Primary Measures:• Weight
• BMI
• Waist circumference
• Self-reported physical activity (PASSID)
• Energy intake (ASA-24)

Secondary Measures:
• Nutrition Knowledge (NKQ)
• Self-efficacy for Weight/Healthy Eating (WEL)
• Self-efficacy for Physical Activity (SRAHP-PA)
• Barriers to Exercise (BTES)
• Social Support for Healthy Eating/Physical Activity - Family and Friends

Exclusion: Pregnant or plan to become pregnant
T1 or T2 diabetes treated with insulin
Uncontrolled HP
Pressure sore stage 14
Loss of 10 lbs or in weight loss study
Weight loss medications in past 3 months
Use PET or G-tube
Planes to move during study period
Significant psychosomatic symptoms

Diabetes Prevention Program (DPP)
• Large multi-site longitudinal study to prevent Type 2 Diabetes
• Overweight or obese adults, disabled populations excluded
• Standard behavioral weight loss intervention with evidence of maintenance

Changes to DPP
• Delivered online using SecondLife.com so women can participate from their own homes
• Greater emphasis on psychosocial factors related to disabilities and weight management
• More disability-relevant content: association between disability and weight gain, adapted cooking, safety precautions, disability-related stress, and examples reflecting the life situation of women with ML
• Altered physical activity recommendations and expanded range of physical activities
• Added self-monitoring progress to accommodate a variety of disabled populations
• MyFitnessPal.com used to record and monitor diet and physical activity
• Removed references/information about diabetes
• Removed clip-art images of able-bodied people and included pictures of women with ML
• More flexibility in establishing weight loss goal

SecondLife: Immersive 3-D virtual environment: free, anonymous; meeting venues with PPT display boards; educational features (e.g., portion sizes, adaptive kitchen equipment, nutrition games, disability features (e.g., ramps, wheelchairs).}

Diabetes Prevention Program (DPP)

GoWoman Intervention

Demographics

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<thead>
<tr>
<th>Category</th>
<th>Mean</th>
<th>SD</th>
<th>Range</th>
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<tbody>
<tr>
<td>Age (in Years)</td>
<td>54.62</td>
<td>8.51</td>
<td>22-90</td>
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<tr>
<td>Disability Duration in Years</td>
<td>21.8</td>
<td>6.94</td>
<td>12-84</td>
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Results

Sample

<table>
<thead>
<tr>
<th>Primary Outcomes: BMI, Weight, and Waist Circumference</th>
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<tr>
<td>Pre-test 2</td>
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<tr>
<td>eDELS (Med)</td>
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<td>35.18</td>
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<table>
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<tr>
<th>Secondary Outcomes</th>
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<tr>
<td>Pre-test 2</td>
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<tr>
<td>eDELS (Med/Med)</td>
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<td>18.05</td>
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<th>Summary and Discussion</th>
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<td>Women who attended at least 50% of the GoWoman sessions lost an average of 3% percent of their body weight and 1.4 inches off their waist circumference.</td>
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<td>The program was highly rated by study participants.</td>
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<td>SL and other online platforms offer a promising alternative for delivering health promotion programming to people with ML who have a great need for, yet face tremendous barriers to accessing, such programming.</td>
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<td>The online GoWoman program offers promise for helping women with mobility limitations improve their diet and physical activity and weight loss.</td>
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Future Directions

Future research is needed:
• Randomized controlled trial with larger sample
• Longer tapered intervention program
• Longer follow-up assessment
• Test mediators and moderators with a larger sample

References