Telehealth-Based Health Coaching Increases m-Health Device Adherence and Rate of Weight Loss in Obese Participants

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Abstract

Background: *Healthy rate of weight loss (RWL) is defined as 1–2 lb of body weight loss per week.*

Objective: *The objective of this study is to investigate changes in adherence to remote monitoring devices and RWL per week in response to a fully online, 12-week, medically monitored, weight management program incorporating weekly video-based health coaching (intervention group [INT]) versus self-guided (control group [CON]).*

Methods: *Twenty-five obese participants (12 males, 13 females) were randomly assigned to either an INT ($n=13$, 106.8 ± 25.46 kg, body mass index [BMI] $=35.19\pm3.91$ kg/m^2) or CON group ($n=12$, 99.8 ± 19.14 kg, BMI $=34.86\pm4.43$ kg/m^2). Program related content was derived from inHealth Medical Services, Inc., Telehealth Enabled Approach to Multidisciplinary care (TEAM™) curriculum. All participants were given two wireless devices (Activity Pop and Body Scale; Withings®, Cambridge, MA) that connected them directly with the research team. The INT group connected via telehealth videoconferencing weekly for health coaching with the registered dietitian and monthly for medical monitoring with the physician, while the CON group did not. Both groups connected with the physician and registered dietitian at baseline to establish clinical goals and at the end to review progress. To analyze the data, independent samples t-tests and χ^2 tests were performed via SPSS v24 with data displayed as average $\pm$ SD; significance set to $p<0.05$.*

Results: *The INT group had increased device adherence when compared with CON ($92\%\pm10\%$ vs. $75\%\pm15\%$ scale [$p<0.05$]) and ($80\%\pm14\%$ vs. $49\%\pm15\%$ tracker [$p<0.05$]). Furthermore, RWL per week was greater in the INT when compared with CON; -0.74 ± 1.8 kg versus 0.18 ± 1.8 kg per week, respectively ($p<0.05$).*

Conclusions: *Weekly health coaching via telehealth can be an effective tool to increase remote device adherence and may help to induce a healthy RWL.*

Keywords: *e-health, telehealth, m-health, behavioral health, home health monitoring*

Introduction

The future of obesity management lies within the implementation of interventions that incorporate the use of new mobile health technology (m-health), including smartphones, wearable activity trackers, and wireless connected scales.[1,2] Videoconferencing is a useful tool to build rapport in telehealth. Recent evidence suggests that participants are successful at losing clinically significant amounts of body weight using m-health technology combined with health coaching.[2–4]

According to the Centers for Disease Control and Prevention, a healthy rate of weight loss (RWL) is defined as 1–2 lb of body weight loss per week.[5] Weight losses of at least 5–10% of initial body weight have been shown to attenuate complications associated with obesity.[6] Furthermore, national organizations recommend 5–10% loss of total body weight for the initial 6 months of any behavioral weight loss intervention to produce meaningful health outcomes.[5]

Monitoring patient behavior change along with evidence-based health coaching methods is a cornerstone of weight loss interventions.[5,7] Using clinician-supervised remote patient monitoring and real-time feedback from m-health devices produces higher total weight loss.[8,9] Without consistent external feedback, device adherence reduces. Specifically in individuals with chronic diseases such as obesity.[1,2] Thus, the purpose of this study was to investigate if live weekly health coaching via videoconferencing increases adherence to m-health devices and to rate of weight

loss during a medically monitored telehealth-based weight loss intervention.

Materials and Methods

A total of 25 obese participants (41.5 ± 13.6 years, 34.6 ± 4.33 kg/m^2) were randomly assigned to the intervention group (INT), ($N = 13$) with health coaching, or the control group (CON) ($N = 12$), self-guided, as previously reported.[3] Inclusion criteria were the following: body mass index (BMI) ≥30 kg/m^2, reporting weight stability, and owning an Apple iPhone®. Exclusion criteria included the following: using tobacco products, diagnosed with type I or II diabetes mellitus, receiving treatment for a serious medical condition (i.e., cancer), taking medications specifically for weight loss, or currently participating in a weight loss program. Approval was obtained from the California State University, Long Beach Institutional Review Board, and participants signed an approved informed consent form before commencement of the study.

All participants were given a Withings® Activité Pop (tracker) and Body+ (scale) and provided access to American Well® (Amwell®) secure HIPAA platform to collect device data and video conference with the research team. Body weight from the Withings scale was uploaded weekly; accelerometer step counts were uploaded daily. Data were transmitted wirelessly via Bluetooth and transferred from the Withings app dashboard to the Amwell online database, which was only accessible by the research team and participants; participants could see their real-time data through both the Withings app and Amwell app. Stratified randomization was completed by the study statistician following a baseline gender and BMI matching. Both the INT and CON groups were single blinded to their randomized condition. Both INT and CON participants were instructed to follow a recommended diet that would induce weight loss of ~1–2 lb per week and increase steps to 10,000/day.[5]

INT participants were monitored each month by the study medical doctor for changes to the participants' medical status for ~10 min per visit. Health coaching sessions were performed weekly (30 min/session for 12 sessions) by a registered dietitian. Health coaching topics were based on weekly RWL progress. INT participants were provided health coaching related to healthy weight loss, including nutrition, fitness, and behavior modification, content that is commercially available via inHealth Medical Services, Inc.'s Telehealth Enabled Approach to Multidisciplinary Care (TEAM™) program. TEAM™ Health coaching methods include evidence-based skillful conversations, to actively and safely engage participants in healthy behavior change to educate on self-managing their obesity.[7] CON participants were monitored pre/post by the medical doctor (10 min per session) and with the registered dietitian (30 min/session) for overall self-monitoring activity with no health coaching. CON participants did not receive additional monthly medical monitoring, weekly health coaching, or education materials.

An *a priori* power analysis (G*Power Version 3.1.0, Franz Faul, Universitat Kiel, Germany) determined 18 participants were needed. Thirty were recruited (15/group) to retain statistical power in the event of attrition or unusable data. The primary outcomes included adherence to wireless devices and RWL per week. Adherence was analyzed by quantifying the frequency of weigh-ins using the scale per week, steps obtained by the tracker per day, as well as the total frequency of visit attendance with the registered dietitian. Participants were defined as adherent if they weighed in at least once per week, wore their tracker daily (24 h/day), and attended one visit per week with the registered dietitian. RWL was calculated by total weight loss (kg) by week, and averaged across the intervention. Data were analyzed via independent samples t-tests and χ^2-tests and were performed via SPSS v25 (IBM Corp. Released 2017. IBM SPSS Statistics for Windows, Version 25.0. Armonk, NY: IBM Corp.) with data displayed as average ± SD; significance set to $p < 0.05$.

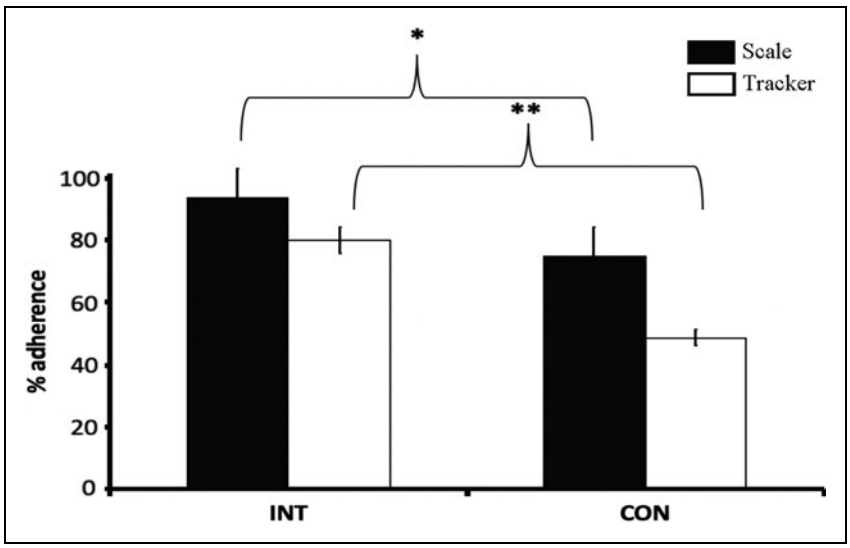

Fig. 1. Over the course of the 12-week study design, there was a significant difference in device adherence between groups ($p < 0.05$). *Indicates a significant difference in scale adherence. **Indicates a significant difference in tracker between the INT and CON groups. Significance was observed at ($p < 0.05$). CON, control group; INT, intervention group.

Results

There were no significant differences in demographics between groups at the commencement of the study. The INT group showed a significantly greater adherence to Bluetooth® devices when compared with the CON group for both the scale 92% ± 0.10% vs. 75% ± 15%, $p < 0.05$, and the tracker 80% ± 0.14% vs. 49% ± 15%, respectively, $p < 0.05$ (*Fig. 1*). RWL was (–0.74 ± 1.8 kg vs. 0.09 ± 1.7 kg)/week when comparing INT versus CON group, respectively. INT participants were 100% adherent to attending weekly videoconferencing sessions.

Discussion

In the current rush to use smartphone applications and online weight management tools, it is critical to still highlight the importance of live clinician-driven clinical care. The present study uses videoconferencing to deliver clinical advice alongside m-health devices and health coaching. Remote technologies have the ability to enhance weight loss program adherence because participants find telehealth acceptable and feasible.[10,11] In the present study, the INT group achieved a favorable RWL and increased device adherence when compared with the CON group. Similar to the current findings, Martin et al. evaluated a smartphone-based weight loss program that resulted in a significantly greater weight loss at 12 weeks when compared with the standard health education group (–7.8 ± 0.46 kg vs. –0.6 ± 0.46 kg, respectively).[8] m-Health devices provide the opportunity to observe individual behavior, from a participant and clinician standpoint. When combining m-health devices with health coaching, there is synergistic support for participants that produces a favorable RWL.

Strategies such as weighing frequently, recording food/beverage intake, and tracking physical activity are methods that are currently being used to increase adherence, but are not sufficient to produce meaningful weight loss without feedback.[12–15] Objective data in the present study tracked both physical activity and weight change. Thus, it should be acknowledged that the differences in weight loss between groups are most likely a combination of poor dietary and physical activity adherence. In the INT group, our study incorporated live human feedback via videoconferencing to drive the discussion of healthy eating, weight loss, and device activity. Since device adherence has been classically associated with both intrinsic and extrinsic motivators, individuals often require one-on-one feedback to attain significant weight loss.[6] Over 12 months, researchers have shown a greater degree of weight loss and increased device usage when text messaging was used to increase adherence.[16] Similarly, patients in our study, with weekly engagement with a registered dietitian, were observed to have a greater RWL and device adherence. The interconnection between high adherence rates and increased weight loss has been attributed to several factors, including social support and feasibility, both of which can be accomplished remotely.[17] In the present study, feedback was provided via video creating this sense of social support and rapport.

In conclusion, weekly health coaching when combined with m-health devices can increase adherence to a telehealth-based weight loss program to produce a favorable RWL.

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Disclosure Statement

One of the coprimary investors, M.A., owns stock ownership in inHealth Medical Services, Inc., The other coprimary investigator, V.G., and all other authors declare no potential conflicts of interest. All authors were collectively active in study design, collection, analysis, and interpretation of data; writing of the report; and the decision to submit the report for publication. inHealth Medical Services, Inc. provided project-related content, including education content, modules, and technology support only.

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