


## ORIGINAL ARTICLE

## Distance learning strategies for weight management utilizing online social networks versus group phone conference call

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### Summary

#### Objective

The increase in technology and online social networks (OSNs) may present healthcare providers with an innovative modality for delivering weight management programmes that could have an impact on health care at the population level. The objective of this study was to evaluate the feasibility and efficacy of using an OSN to deliver a weight loss programme to inform future, large-scale trials.

#### Methods

Seventy individuals (age =  $47 \pm 12.4$ , minority = 24.3%) with obesity (BMI =  $36.2 \pm 4.0$ ) completed a 6-month weight loss intervention and were randomized to either a conference call or OSN delivery group. Weight loss was achieved by reducing energy intake by 500–700 kcal·d<sup>-1</sup> below estimated total daily energy expenditure and progressing physical activity to 300 min/week. Behavioural weight loss strategies were delivered weekly throughout the intervention.

#### Results

Conference call and OSN groups produced clinically meaningful weight loss of  $\geq 5\%$  from baseline to 6 months (phone =  $-6.3 \pm 6.4\%$ , OSN =  $-5.8 \pm 6.7\%$ ). There was no significant difference in weight change between groups ( $p = 0.765$ ).

#### Conclusion

The phone and OSN groups met the American Heart Association/American College of Cardiology/The Obesity Society's Guidelines by reducing baseline weight by 5–10% within 6 months. OSNs appear to be a viable delivery platform for weight loss interventions; however, larger scale adequately powered trials are needed.

**Keywords:** Intervention, online social network, phone, weight loss.

## Introduction

With the high prevalence of obesity in US adults (1) and obesity contributing to many comorbidities such as heart disease, hypertension, diabetes, some cancers, psychosocial and economic difficulties (2–4), developing innovative methods to translate and deliver weight management interventions in diverse real-world settings is critical. Several alternatives to traditional face-to-face group delivery of weight management interventions including mail or email (5,6), internet (7,8), a combination of phone, internet

and email (9), individual phone counselling (10,11), group phone counselling (12) and text messaging (13) have demonstrated clinically meaningful weight loss (14).

Online social networks (OSNs) such as Facebook® or Twitter® have become a popular platform for information exchange and delivery. OSNs provide a platform where individuals can create public or semi-public profiles, connect ('friend') with other users, interact and obtain information, within a bounded system (15). Furthermore, OSNs support the upload of files, photos and audio recordings that can be accessed by anyone in one's

network or by all viewers. A recent Pew survey on internet use reported 84% of adults in the USA are online with 74% reporting use of OSNs (16). Because of this popularity, OSNs are a potential platform for the delivery of health behaviour change interventions, such as weight management, to large groups of individuals in a cost-efficient manner.

Previous research has demonstrated a positive relationship between social support and weight loss (17–20). For example, Wing *et al.* found that 66% of individuals who completed standard behavioural treatment plus social support maintained their weight loss in full, compared with 24% who received standard behavioural treatment without social support (17). However, there is limited research on behavioural weight loss interventions delivered using OSNs (21–25). The majority of previous trials used components of OSNs, such as bulletin boards or chat rooms in combination with traditional weight management intervention delivery rather than OSNs as the primary platform. The limited number of trials that used OSNs as the primary delivery platform was of short duration (less than 6 months) and had conflicting results. Sepah *et al.* examined participant's receiving a weight management intervention through a study-specific OSN that incorporated small-group support, health coaching, the Diabetes Prevention Program curriculum and digital tracking tools. At 16 weeks, participants lost 5.0% of their baseline weight (24). However, not all studies have been promising; a review by Ashrafian *et al.* (26) found that interventions using components of OSNs for weight management produce a modest 1.4% greater reduction in body weight compared with control participants. Furthermore, Greene *et al.* (21) reported a 6-month intervention using a study-specific OSN platform, combining education materials on diet and physical activity (PA) with social networking versus a control group receiving only education materials produced 2.8% and 0.8% weight loss, respectively. Similarly, Pagoto *et al.* (23) examined participants who received a weight loss programme using an established OSN (Twitter©) and reported weight loss of 3% from baseline to 12 weeks. The inconsistencies in results for studies using OSNs to deliver weight management are partially attributed to the variation in intervention design and differences in OSN platforms. Moreover, the reduced cost of OSN-delivered intervention has been cited as a major advantage (26); however, a cost analysis for OSN interventions has yet to be completed.

Therefore, to evaluate the practicality and efficacy of using an OSN to deliver a weight management programme, we conducted a 6-month randomized feasibility study comparing weight loss between an established cost-effective weight management delivery system (group conference call) (12) compared with an OSN

(Facebook©) delivery system. The primary aim was to determine if weight loss at 6 months was significantly different for participants randomized to group conference calls or OSN groups. Secondary outcomes included changes in waist circumference as an indication of reduction in chronic disease risk, dietary intake and PA to help explain both group and individual differences in weight change. Lastly, a cost analysis of the group conference calls and OSN delivery was conducted.

## Methods

The rationale, design and methods for this trial have been described in detail in a previous publication (27). Information herein pertains to the current report.

### Participants

Seventy adults with obesity (age = 21–70 years.; body mass index [BMI] = 30.0–45.0 kg·m<sup>-2</sup>) were randomized at a 1:1 ratio, stratified by sex, to either group phone conference call or OSN groups. Potential participants were excluded if they were unable to participate in moderate intensity PA (i.e. walking), were regularly exercising (>90 min/week) or at serious medical risk (as determined by the studies of a medical director). Additionally, participants were excluded if they reported any of the following within the previous 6 months: participating in a weight loss or PA programme, not weight stable, pregnant lactating or planned pregnancy. To improve the generalizability, individuals with chronic medical conditions were allowed to participate because they represent the population typically seeking weight management. For instance, individuals with hypertension or type II diabetes were not excluded if their condition was controlled by medication. Written informed consent was obtained from all participants prior to participation as approved by the Human Subjects Committee at the University of Kansas Medical Center. Participants were allowed to keep the Fitbit Flex wireless activity monitor used to self-monitor PA (described in the succeeding sections) as compensation for participating in the trial.

### Intervention-conceptual framework

We employed social cognitive theory (28,29), problem-solving and the relapse prevention models (29–31). Key elements of the intervention, incorporated through in-class/online discussions and out-of-class assignments to facilitate change in both diet and PA, included goal-setting, self-monitoring, direct reinforcement, interaction with health educators and social support to facilitate change in diet and PA.

### Health educator training/standardized materials

Health educators who delivered the intervention were experienced in weight management and had backgrounds in nutrition, exercise physiology and/or behavioural counselling. Health educators were trained to deliver the phone intervention by listening to recordings of sessions delivered by phone from a previously completed trial (12) and participating in mock group sessions that simulated live groups. Health educators were randomly assigned to administer one conference call and one OSN congruently to reduce the potential for health educator bias. The diet and PA protocols, behavioural lesson topics and experiential learning assignments were identical for both groups.

### Online social network intervention

Participants joined a private OSN group of 12–18 individuals using their personal OSN accounts. The OSN intervention was structured into 24 weekly online modules for 6 months. Throughout each of the 24 weeks, the health educators posted lessons (one per week), audio recordings (one per week) and four comments per week in the discussion forum to highlight the major points of the lesson and responded with additional comments to problem solve with participants if necessary. Participants were instructed to post a minimum of four comments on the message board per week, and intervention compliance for the OSN participants was determined by participants meeting the four post minimum. While 'likes' show that participants were at least accessing the private group page, comments were considered a better indicator of compliance because of the increased interaction with the material required in order to post a comment. The content and discussion topics were identical for both the phone and OSN group; however, participants in the OSN group could access study materials and interact with group members  $24 \text{ h} \cdot \text{d}^{-1}$ , 7 days/week and were able to work through study materials at a rate that was comfortable for them within the 1-week module guidelines. Participants were encouraged to interact with each other and with the health educator using the OSN.

### Phone conference call sessions

Sixty-minute group phone conference meetings of 12–18 participants were conducted one evening per week (total 24 meetings) for 6 months. Participants called a toll-free number 5 min prior to the scheduled meeting time and entered a unique identifying code that allowed them to join the meeting. Participants were expected to remain on call for the duration of the 60-min session. The

meeting protocol included a check-in question to generate discussion regarding diet and PA, a review of compliance with the diet and PA protocols, a lesson on a weight management topic and an experiential learning assignment that required problem-solving or the practice of behavioural weight management strategies to be completed prior to the next meeting. During the phone calls, participants in attendance were encouraged to actively participate in the call and interact with other participants. All calls were recorded and the audio posted for the private OSN group as optional learning material.

### Weight loss diet for phone and online social network groups

For participants in both the phone and OSN groups, energy intake was reduced  $500\text{--}700 \text{ kcal d}^{-1}$  below estimated total daily energy expenditure using the equation of Mifflin–St Jeor (32) using an activity factor for sedentary/low active individuals of 1.15. Nutritionally balanced, high volume, lower fat (fat = 20%) diets as recommended by the Academy of Nutrition and Dietetics (33) and the USDA's MyPlate approach (34) were prescribed for all participants. Participants were provided examples of meal plans consisting of suggested servings of grains, proteins, fruits, vegetables, dairy and fats based on their energy needs and were counselled on appropriate portion sizes.

### Physical activity for phone and online social network groups

A progressive, moderate intensity PA programme (walking, jogging, biking, etc.) as recommended in the '2009 American College of Sports Medicine Position Stand on Physical Activity Interventions for Weight Loss and Prevention of Weight Regain in Adults', (35) was prescribed. PA progressed from 45 min/week in week 1 to  $300 \text{ min} \cdot \text{week}^{-1}$  at the end of week 16, and remained at  $300 \text{ min} \cdot \text{week}^{-1}$  for the duration of the study. Fitbit wireless activity monitor (Flex tracker, Fitbit Inc., San Francisco, CA, USA; size  $35.5 \times 28 \text{ mm}$ ) was provided to track steps, in addition to acting as a motivational tool and an incentive for participation in the intervention.

### Self-monitoring

Participants in both the phone and OSN groups recorded body weight using a calibrated wireless digital scale (Withings Wireless Scale, WITHINGS Inc., Cambridge, MA, USA), diet/food consumed and minutes of PA using the MyFitnessPal™ application and steps using a Fitbit activity monitor. Participants were instructed to record

weight a minimum of once per week; however, daily weighing was encouraged. Fitbit and MyFitnessPal™ data were to be submitted daily. All applications were synced to the MyFitnessPal™ application, which uploaded the data to a cloud server. Self-monitoring data were available for real-time feedback to the participants through the applications as well as downloaded by the health educator to provide participant feedback and education. Self-monitoring weights from the wireless scale were used only for participant feedback and not for outcome weight.

### Assessments

Outcome measures were collected in our laboratory by trained staff at baseline and following weight loss (month 6).

#### Body weight, height, body mass index and waist circumference

Body weight was recorded using a digital scale accurate to  $\pm 0.1$  kg (Befour Inc Model #PS6600, Saukville, WI, USA). All participants were weighed between 0600 and 1000 h prior to breakfast wearing a standard hospital gown after attempting to void. Height was measured using a stadiometer (Model PE-WM-60-84, Perspective Enterprises, Portage, MI, USA), and BMI ( $\text{kg m}^{-2}$ ) was calculated. Waist circumference was measured using the procedures of Lohman *et al.* (36).

#### Diet intake

Baseline and 6 month energy and macronutrient intake were assessed using data obtained from the MyFitnessPal™. During the orientation session, all participants completed a tutorial on how to use and log diet information in the MyFitnessPal application using their personal device. Participants were instructed to log all food and beverages consumed into the MyFitnessPal™ application for three consecutive days (two weekdays, one weekend day) prior to participants' scheduled assessment visit. MyFitnessPal™ would then sync the data to a cloud server which was then downloaded by a research staff.

#### Physical activity

A randomly selected subset of participants wore an ActiGraph GT1X portable accelerometer (ActiGraph LLC, Pensacola, FL, USA) on a belt over the non-dominant hip for seven consecutive days at baseline and month 6. Accelerometer data were collected in 1-min epochs with

a minimum of 10 h constituting a valid monitored day. Participants with a minimum of three valid days were included in the analysis. The outcome variable was the average ActiGraph counts  $\cdot \text{min}^{-1}$ .

### Cost analysis

Resources used were measured by surveying participants at the end of the intervention (6 months) and by reviewing time logs maintained by health educators. Surveys were completed by 62 of the 70 participants (89%). Resource use data were converted to costs using standard prices (i.e. the median hourly wage in the area). A two-sample *t*-test was used to compare average costs for the conference call and OSN groups.

### Statistical analyses

The primary analysis compared weight loss at 6 months between phone and OSN groups using sample *t*-test. Our intention-to-treat approach for handling missing data used multiple imputation – i.e. 100 imputed datasets were generated and then analysis results from each imputed dataset were combined to make valid statistical inference.

For secondary variables (change in BMI, percent change in weight, change in waist circumference and energy and macronutrient intake), two-sample *t*-test was used to compare between the groups without imputation. We examined the distribution of weight loss based upon categories of change between the groups using a chi-square test of homogeneity. Diet compliance (number of complete records submitted on MyFitnessPal™ and number of diet records within  $\pm 100$  kcals of the prescribed calorie goal) as well as self-report PA, steps (Fitbit) and accelerometer data were compared between the groups using two-sample *t*-test.

## Results

### Participants

Baseline data for the 70 eligible participants who initiated the weight loss intervention (OSN,  $n = 34$ ; phone,  $n = 36$ ) are presented in Table 1. Sixty participants (86%) provided weight data at baseline and 6 months. The study sample had obesity (BMI  $\sim 36 \text{ kg} \cdot \text{m}^{-2}$ ), were middle age ( $\sim 47$  years), predominantly female ( $\sim 84\%$ ) and composed of  $\sim 24\%$  minorities. There were no baseline differences between participants randomized to phone or OSN groups.

**Table 1** Participant characteristics

Variable	Phone			OSN			<i>p</i> -value
	<i>N</i>	Mean	SD	<i>N</i>	Mean	SD	
Age (years)	36	47.6	11.7	34	46.8	13.2	0.807
Weight (kg)	36	100.0	15.2	34	98.8	13.7	0.719
BMI (kg·m <sup>-2</sup> )	36	35.6	3.8	34	36.8	4.1	0.234
Waist circumference (cm)	36	101.8	10.9	34	102.9	11.7	0.687
Female ( <i>n</i> , %)	30	83.3		29	85.3		0.822
Minorities ( <i>n</i> , %)	8	22.2		9	26.3		0.770
Accelerometer data counts·min <sup>-1</sup>	18	256.6	102.3	18	266.1	127.0	0.806

BMI, body mass index; OSN, online social network.

### Body weight, body mass index, waist circumference

Changes in weight, BMI and waist circumference are reported in Table 2. Weight change (kg) from baseline to 6 months was not significantly different between groups ( $p = 0.566$ ). Weight change (%) from baseline to 6 months was  $-6.3 \pm 6.4\%$  and  $-5.8 \pm 6.7\%$  for phone and OSN groups, respectively ( $p = 0.765$ ). No significant group differences were observed for BMI and waist circumference. At 6 months, the proportions of participants who gained weight and those who lost 0 to <5%, 5 to <10% and  $\geq 10\%$  weight also did not differ significantly between the phone and OSN groups (Table 3).

### Intervention compliance and dietary intake

Attendance for the phone group from baseline to six months was 77.7% while compliance for the OSN group ( $\geq 4$  comments/week) from baseline to 6 months was 29.5%. Overall engagement with the OSN group was quantified by the number of times participants 'liked' a

**Table 2** Changes for weight, BMI and waist circumference

Variable	Phone		OSN		<i>p</i> -value
	Mean	SD	Mean	SD	
Weight (kg)	-6.0	6.1	-5.9	6.9	0.566
% Weight	-6.3	6.4	-5.8	6.7	0.765
BMI (kg·m <sup>-2</sup> )	-2.1	2.2	-2.2	2.5	0.847
Waist circumference (cm)	-3.6	4.9	-6.0	8.3	0.196
Accelerometer data counts·min <sup>-1</sup>	17.8	95.4	20.2	126.6	0.963

Accelerometer data for phone group,  $n = 15$ , and for OSN group,  $n = 16$ .

BMI, body mass index; OSN, online social network.

**Table 3** Categories of weight change

Weight category	Phone		OSN		<i>p</i> -value
	<i>N</i>	%	<i>N</i>	%	
Gained	4	11.1	4	11.8	0.643
Lost 0 to 4.9%	11	30.6	13	38.2	
Lost 5 to 9.9%	12	33.3	6	17.7	
Lost 10% or more	5	13.9	5	14.7	
Dropped	4	11.1	6	17.7	

OSN, online social network.

study-related post and a post by a peer or posted a comment. The average number of 'likes' per person each week was 1.3. The average number of comments per person each week was 3.2. Participants in the OSN group reported listening to ~36% of the posted audio lectures. The proportion of diet records submitted on MyFitnessPal™, records within  $\pm 100$  kcals of the prescribed calorie goal, PA minutes (self-report) and steps (Fitbit) each week are shown in Table 4. Diet records submitted within  $\pm 100$  kcals of the prescribed calorie goal were significantly lower in the OSN group ( $22.0 \pm 21.2\%$ ) compared with the phone group ( $44.0 \pm 26.2$ ;  $p < 0.001$ ). No significant differences were found between the groups for any other variables. Results of diet intake are shown in Table 5. There were no statistically significant differences between the phone and OSN groups for total energy, fat, carbohydrate and protein intake at baseline or 6 months.

### Physical activity

The average target for minutes of PA was  $232 \text{ min} \cdot \text{week}^{-1}$  from baseline to 6 months due to ramp up of the progressive protocol to  $300 \text{ min} \cdot \text{week}^{-1}$ .



**Table 4** Programme compliance data

Variable	Phone			OSN			p-value
	N	Mean	SD	N	Mean	SD	
Steps per day	36	6,810.7	2,852.4	33	7,050.6	3,332.1	0.748
Self-reported PA minutes	32	118.8	91.1	32	103.1	149.7	0.775
Met calorie goal (%)	36	44.0	26.2	33	22.0	21.2	<0.001
Complete weekly reports (%)	36	37.6	27.4	33	34.7	28.9	0.561

OSN, online social network; PA minutes, physical activity averaged across 0–6 months.

**Table 5** Daily energy and macronutrient intake

Variable	Phone			OSN			p-value
	N	Mean	SD	N	Mean	SD	
kcal·d <sup>-1</sup>							
Baseline	30	1,678.5	409.1	30	1,738.0	322.1	0.534
6 months	26	1,294.2	275.4	20	1,305.8	267.8	0.887
Carbohydrate (g)							
Baseline	30	182.3	56.3	30	184.4	43.6	0.874
6 months	26	140.1	34.6	20	154.8	35.5	0.165
Fat (g)							
Baseline	30	68.5	20.0	30	73.4	18.7	0.335
6 months	26	53.1	15.4	20	46.8	14.6	0.168
Protein (g)							
Baseline	30	68.6	19.1	30	72.6	16.1	0.390
6 months	26	61.2	14.2	20	61.6	10.3	0.929

OSN, online social network.

Neither group achieved the average target during the 6 month intervention based on self-report data (phone:  $118.8 \pm 91.1$ ; OSN:  $103.1 \pm 149.7$ ). There were no significant differences between the groups for self-reported minutes of PA or steps (Fitbit, Table 4). Results from the accelerometer for counts per minute indicated no significant group difference in change in PA (Table 3).

### Cost analysis

Participant time required for the intervention was significantly higher for the phone group ( $1050.6 \pm 226.8$  min) compared with the OSN group ( $476.4 \pm 481.2$  min;  $p < 0.01$ ) over the course of 6 months. However, participant time represented a small portion of the total cost (phone,  $\$310.28 \cdot \text{person}^{-1}$ ; OSN,  $\$163.37 \cdot \text{person}^{-1}$ ). Health costs per participant for the 6-month intervention were similar for the two groups ( $\$46.76$  phone;  $\$50.26$  OSN). Similarly, equipment costs were comparable between phone group ( $\$10,680$ ) and the OSN ( $\$10,500$ ). The total cost per participant for the 6-month intervention was ~30% higher for the phone group ( $\$512.05$ ) compared with the OSN group ( $\$363.63$ ).

### Discussion

Results from this pilot study indicated that weight loss from an intervention delivered through an OSN was not significantly different compared with an established cost-effective weight loss delivery system (group phone conference call). Both phone and OSN groups met the American Heart Association/American College of Cardiology/The Obesity Society's Guidelines (14) by reducing baseline weight by 5–10% within 6 months. These results compare favourably with results from Sepah *et al.* in which participants lost 5.0% of their baseline weight at 16 weeks and maintained 4.8% weight loss after 15 months (24). While there were no significant differences in mean weight loss or the proportions of participants who gained weight and those who lost 0 to <5%, 5 to <10% and  $\geq 10\%$  between participants randomized to OSN and phone, more individuals in the phone group lost >5% of their body weight, suggesting that an adequately powered trial is needed to compare weight loss between phone and OSN.

Attendance could not be directly compared between groups because of the variation of the delivery methods

and expectations. However, from baseline to 6 months, participants in the phone group attended ~78% of the scheduled meetings while participants in the OSN group met the minimum four post recommendation per week criteria ~30% of the time. Participants in the OSN group reported a lack of familiarization with other members limited their comfort of sharing information in the OSN group. Future studies need to address this issue. Possible solutions would have participants meet for a small number of face-to-face sessions prior to starting or throughout the OSN intervention to gain familiarity with one another. Compliance of weekly data reporting of steps, PA, weight and energy intake did not differ between groups. However, compliance with logging was low with both groups only submitting complete reports ~36% of the time and reporting of energy intake data being the most frequently missed. Because adherence factors such as percent complete weekly reports, reports within  $\pm 100$  calories of daily goal, number of weights submitted and steps have previously been shown to lead to greater weight loss (20,37–41), future studies comparing phone and OSN should strive to increase adherence to the intervention protocol as greater adherence to these process variables could produce greater weight loss. Alternate diet strategies such as portion-controlled meals may be beneficial by reducing the barrier of tracking specific foods consumed.

In the attempt to automate the intervention, energy intake outcome assessments and weekly data reporting were completed using the MyFitnessPal™ application. Participants were instructed not to change their diet and were not given a reduced calorie goal prior to the first session. However, because of the low energy intake values recorded at baseline, it appears that nutritional feedback from the MyFitnessPal™ application may have resulted in participants either underreporting or altering their diet during assessments. Thus, the values of energy intake should be interpreted with caution. Validated measures of energy intake such as photo-assisted dietary assessments may be used to assess daily energy and macronutrient intake and likely would improve the accuracy of dietary assessment (42). Furthermore, participants indicated problems understanding how to sync and navigate devices within their mobile applications. This could explain the low numbers for data reporting. Future studies might improve results with data compliance by increasing the frequency or implementing longer duration technology trainings.

The total cost per participant for the 6-month intervention was ~30% higher for the phone group compared with the OSN group. As cost is frequently cited as a barrier by participants, a cost saving of 30% (~\$148) could represent a substantial savings for an individual wanting to lose

weight and paying for such services out of pocket. In addition, provider cost was also substantially lower (~\$574) in the OSN group, which could make this programme more feasible for providers to offer to individuals in low-income settings or as a low-cost corporate wellness opportunity for employers. In addition, the freedom for participants to attend at their own leisure and for providers to deliver the programme on a flexible schedule may increase the number of qualified individuals who are not only interested in attending such programmes but also those who are interested in providing weight management. This may allow for more service providers to engage in weight management who were not previously able to due to time, cost or the constraints of reaching their cliental (i.e. remote/rural locations).

Strengths of this study include (i) a design specific to evaluating two potentially effective strategies for the delivery of a weight loss intervention; (ii) both technologies evaluated are readily available and accessible. Thus, the interventions could be widely disseminated; (iii) phone comparison group is a successful technology for weight loss intervention delivery (12) and (iv) use of an established OSN. Using an existing popular OSN reduces the training required to manoeuvre through the site as majority of the public is already familiar with the site. Additionally, it reduces the barrier of participants having to log into additional sites to obtain information. However, this study is not without its limitations. Because of funding and supply restraints, limitations include (i) sample size and the study was not powered to detect between group differences; (ii) lack of a weight maintenance follow-up period; (iii) inability to blind participants and health educators to treatment condition and (iv) potential differences in motivation to lose weight between participants who agree to participate in a research study and the general public. Despite these limitations, both groups did achieve the recommended weight loss of >5% within 6 months (14).

## Conclusion

The purpose of this study was to inform future, larger scale, adequately powered trials. The primary finding from this investigation was that a weight loss intervention delivered using group conference calls and OSN resulted in clinically meaningful weight loss. Although self-monitoring components essential to weight loss (such as reporting diet and PA) were low, these components were used equally across the groups. Future research is needed to determine ways to increase engagement and utilization of the intervention and self-monitoring methods to increase adherence and weight loss success. Furthermore, with minimal resources required to administer a

behavioural weight loss intervention through OSNs, its utility for disseminating weight loss interventions to the public and supporting long-term weight loss maintenance should continue to be explored.

## Conflict of Interest Statement

No conflict of interest was declared.

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