

The Efficacy of a Walking Intervention Using Social Media to Increase Physical Activity: A Randomized Trial

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Background: Facebook may be a useful tool to provide a social support group to encourage increases in physical activity. This study examines the efficacy of a Facebook social support group to increase steps/day in young women. **Methods:** Female college freshmen ($N = 63$) were randomized to one of two 8-week interventions: a Facebook Social Support Group ($n = 32$) or a Standard Walking Intervention ($n = 31$). Participants in both groups received weekly step goals and tracked steps/day with a pedometer. Women in the Facebook Social Support Group were also enrolled in a Facebook group and asked to post information about their steps/day and provide feedback to one another. **Results:** Women in both intervention arms significantly increased steps/day pre- to postintervention ($F_{(8,425)} = 94.43, P < .001$). However, women in the Facebook Social Support Group increased steps/day significantly more ($F_{(1,138)} = 11.34, P < .001$) than women in the Standard Walking Intervention, going from 5295 to 12,472 steps/day. **Conclusions:** These results demonstrate the potential effectiveness of using Facebook to offer a social support group to increase physical activity in young women. Women in the Facebook Social Support Group increased walking by approximately 1.5 miles/day more than women in the Standard Walking Intervention which, if maintained, could have a profound impact on their future health.

Keywords: young women, pedometer, Facebook, social support

The benefits of physical activity are well-established, yet the majority of the U.S. population is not regularly active.¹ For many young adults, the transition from high school to college is an important milestone in their lives, one where habits are formed (including physical activity habits) that are carried into adulthood. Unfortunately, physical activity levels tend to decline during the transition from high school to college, especially among women.²⁻⁵ Increasing daily walking can have lasting health benefits for college-aged women.⁶ Without intervention, the declines in physical activity observed from high school to college will likely continue into adulthood, placing these individuals at increased risk for health detriments related to physical inactivity including coronary heart disease, type 2 diabetes, breast cancer, and colon cancer.⁷

Research has documented the importance of social support in the success of physical activity interventions.⁸⁻¹⁰ For instance, in a study including over 2700 college students, lack of social support was a significant, independent predictor of insufficient physical activity among men and women.⁹ Additionally, among a sample of over 3300 adults, perceived social support was the strongest, independent predictor of physical activity.¹⁰ In fact, individuals who perceived low levels of social support for physical activity were twice as likely to be sedentary compared with individuals perceiving high levels of support to be active. Given the strong relationship between social support and physical activity, interventions targeting physical activity will likely benefit from also targeting social support to be active.

Social media is, by nature, a platform to facilitate social networks. Thus, social media sites, the most popular of which is Facebook,¹¹ may serve as an effective approach to the necessary intervention on physical activity levels among college women. Facebook users who are “friends” on the site or are part of the same group within the site can comment on each other’s information, in addition to posting their own. These social support networks may be useful to encourage healthy behaviors such as physical activity. The use of Facebook may also aid in ameliorating a frequently reported hindrance of physical activity interventions delivered through the internet which is getting and keeping participants engaged and visiting the intervention website.¹²⁻¹⁶ The average Facebook user logs into Facebook 3 times per day,¹⁷ a login rate that is 7 times higher than that seen among previous internet-based physical activity interventions.¹⁶

The use of social media in health-promoting interventions is not new and has resulted in improvements in several aspects of health (eg, sexual health, food safety, and weight loss).¹⁸⁻²⁰ However, limited research is available examining the use of Facebook in physical activity interventions.²¹ Among the few studies conducted, there have been mixed results.^{22,23} In one study, researchers compared the effectiveness of a 12-week physical activity intervention that included a Facebook component to an education-only physical activity intervention in female undergraduates.²² Both intervention groups significantly increased physical activity levels (quantified as energy expenditure), but there were no differences in these increases between groups. However, within this study, participants were required to log onto a separate website (other than Facebook) to access intervention materials which may have impacted their use of these materials and the potential success of the intervention. Another intervention compared the efficacy of 2 Facebook physical activity interventions (one intervention with more advanced features than the other) in a group of young cancer survivors.²³ These authors found that both Facebook-mediated physical activity interventions were

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successful to increase self-reported physical activity, but the intervention including more extensive intervention strategies increased physical activity to a greater degree. Although positive, results from this study leave in question which of the additional intervention strategies (in-depth physical activity education, physical activity tracking, goal-setting, and feedback or social support from peers and the intervention leader) resulted in improved effectiveness. In addition, this study was conducted on cancer survivors, and thus, investigations including young women in the general population are warranted. Finally, both of these prior studies relied on self-reported physical activity which can be affected by human error such as poor recall or misperception of physical activity intensity,²⁴ and therefore, future investigations are needed using an objective tool to assess physical activity.

The current study was designed to address the gaps in previous literature. The purpose of this investigation was to examine the efficacy of a Facebook Social Support Group to increase physical activity among young women. Potential mechanisms associated with intervention success, including engagement, adherence, and baseline physical activity and Facebook use levels, were also examined.

Methods

Participants

Participants included female freshman at a large, urban university in the Midwest. Recruitment occurred in the spring semester of 2013 through announcements made in large university classes and via individual e-mails gained through a university list-serve. Interested students were deemed eligible if they were a) currently living in

on-campus dormitories; b) a Facebook user; and c) insufficiently active, which was defined as obtaining less than 7500 steps/day.²⁵ A full description of participant recruitment is depicted in Figure 1.

Study Procedures

This study was an 8-week, randomized trial comparing a Facebook Social Support Intervention to a Standard Walking Intervention. Steps/day was measured objectively at baseline and at the end of the 8-week intervention period. Participants attended a screening meeting and made 2 laboratory visits (one before the start of the intervention and one after the completion of the intervention) where measures were taken. During the screening meeting, participants completed a general screening questionnaire to determine their eligibility for the study. Eligible participants wore a sealed pedometer for 1 week so that the number of steps taken per day could not be ascertained by the participant. The pedometer was sealed to avoid potential changes in behavior based on feedback from this device.^{26,27} After completion of this week of monitoring, participants met with research staff again to return the pedometer. During this visit, the 63 women who qualified were asked to complete a general health history questionnaire and the Facebook Intensity Scale.²⁸ Anthropometric measures including height, weight, and waist circumference were taken using standard procedures.²⁹ Height was measured using a stadiometer (Continental Scale Corporation, Bridgeview, IL), body mass was measured using a physician's balance beam scale (Detecto 339, Web City, MO), and BMI was calculated based on these measures. Waist circumference was taken at the narrowest part of the torso between the iliac crest and the most inferior rib. Once all measures were completed, participants were

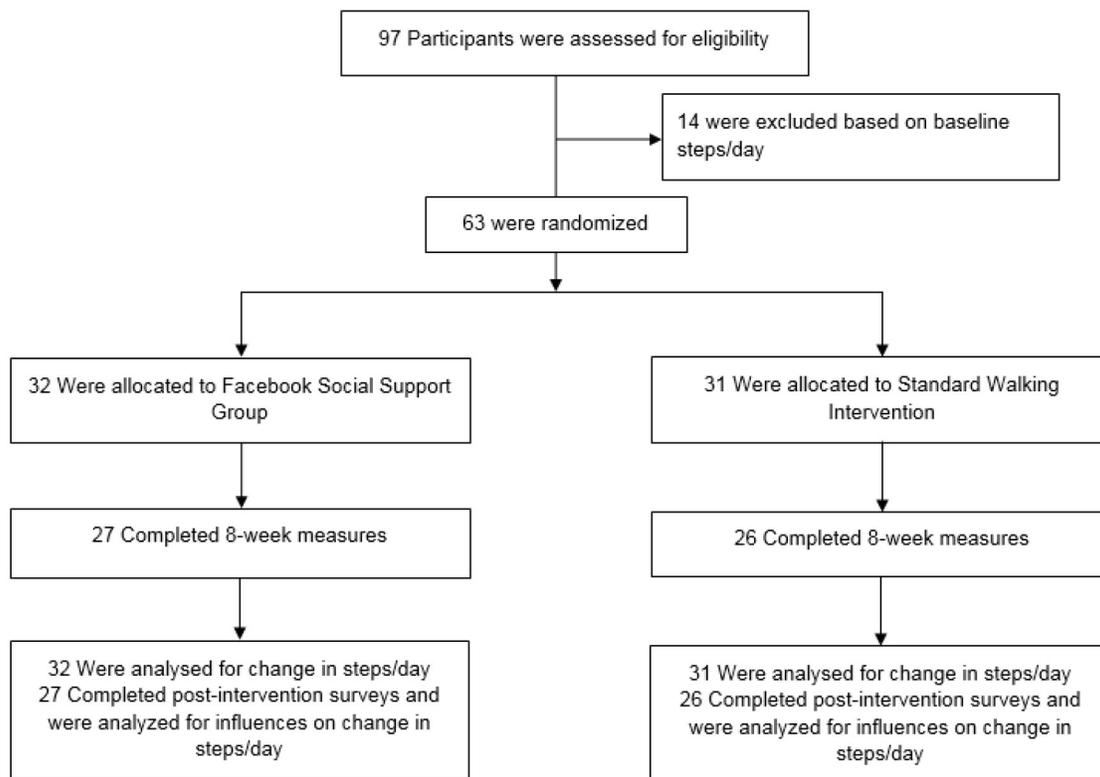


Figure 1 — Flow diagram of participants throughout intervention.

randomized, using Urn Randomization, into one of two groups: a Facebook Social Support Group or a Standard Walking Intervention that served as a comparison condition. All participants were asked to visit the laboratory for a second time directly after completing week 8 of the intervention. Pedometers and weekly logs were collected, and average steps/day for all weeks of the intervention were cross-checked with that reported by participants. Measures of height, weight, and waist circumference were assessed again. All study procedures were approved by the university's Institutional Review Board. Recruitment, data collection, and data analysis occurred in 2013.

Intervention

The individuals randomized to the Facebook Social Support Group received feedback on their baseline physical activity level (ie, average steps/day), a pedometer, 8 paper logs to record steps taken per day, and a weekly personalized step goal of increasing steps/day by 10% of the previous week's average steps/day; recommendations were not to exceed 15,000 steps/day. Each week of the intervention, participants received a personal Facebook message from the intervention leader requesting a report of their steps/day for the previous week. Based on their average steps/day, participants received an additional Facebook message with their new step goal and feedback (ie, "Congratulations! You're doing great!"). Feedback when goals were met and when goals were not met were consistent for all participants. Individuals in this intervention were also enrolled in 1 of 4 private Facebook groups, with all groups receiving the same intervention materials. Groups were established on a rolling basis and capped at 8 participants each.³⁰ On the groups' Facebook page, participants were encouraged to report the ways in which they accumulated their steps and to provide feedback and encouragement to fellow participants as often as possible. Finally, the lead author served as the intervention leader for all groups and added weekly posts to each group's Facebook page with educational information about physical activity.

Similar to the Facebook Social Support Group, individuals randomized to the Standard Walking intervention received the following intervention strategies: feedback on their physical activity level, a pedometer, 8 paper logs to track their steps/day, and a weekly personalized goal of increasing steps/day by 10% of previous week's average steps/day. However, for this group, contact from the intervention leader was in the form of weekly e-mails starting with a request that participants report, via a return e-mail, their average steps/day directly to the intervention leader. Based on each participant's response, the intervention leader sent a follow-up e-mail which included their new step goal as well feedback and educational information about physical activity (which was exactly the same as that given to the Facebook Social Support Group). Participants in the Standard Walking Intervention did not receive social support via Facebook or other means.

Main Outcome Measures

Physical activity was measured objectively as steps taken per day using a spring-loaded pedometer (Yamax SW-200). The pedometer was worn clipped onto the waistband on the right hip during all waking hours (except while showering or swimming) throughout the duration of the 8-week intervention. Spring-loaded pedometers have been shown to have 96% accuracy when compared with direct observation³¹ and are reliable, demonstrating no significant difference in steps counted when tested over 5, 100-step trials.³²

Several potential predictors of increases in physical activity were examined among both groups and included baseline steps/day and intervention adherence. Intervention adherence was quantified by tracking the number of times participants provided their weekly steps/day to the intervention leader. If steps/day were not provided for a week by a participant, a step goal for the following week could not be calculated. Thus, a step goal was not provided to that participant for that week. Participants were not, however, withdrawn from the intervention if they missed reporting step goals to the intervention leader.

Additional potential predictors of increases in physical activity were examined among participants in the Facebook Social Support Group which included baseline level of Facebook usage and engagement within the Facebook group. Baseline level of Facebook usage was measured using the Facebook Intensity Scale.²⁸ Engagement in the Facebook group was assessed by tracking the number of times participants posted to the group and the types of posts they made. Types of posts were categorized into 4 groups: posts on number of steps, posts on how steps were achieved, comments on others' posts, and responses to comments.

Statistical Analysis

A power analysis was performed based on a similar study,³³ and it was determined that 62 total participants, 31 per intervention arm, were needed at the start of the study to reach a power of 80% at an alpha level of 0.01, assuming 20% attrition, and an effect size of 0.60 (expressed as Cohen's *d*). Descriptive statistics (mean and standard deviation) were calculated for height, body mass, BMI, and waist circumference. Before conducting statistical analyses of change in steps/day, statistical tests for skew and kurtosis were performed on these variables within both groups at baseline and week 8. No significant deviations from normality were found. Differences between groups on demographic and anthropometric variables at baseline were examined using independent *t*-tests.

To analyze if there were significant changes in steps/day for either group from week to week of the intervention, and if these changes differed by the independent variable (ie, intervention group), a 2 by 9 (intervention group by time) repeated measures mixed model ANOVA was conducted. Potential predictors of change in physical activity were also examined for women in each group to gain a better understanding of what impacted efficacy of these interventions. Two multiple regression analyses were conducted (one for each intervention arm) where calculated change in steps/day was the dependent variable. For the Facebook Social Support Group, the following variables were included as predictor variables and entered simultaneously: number of times participants posted to the Facebook group (intervention engagement), number of intervention message responses (intervention adherence), baseline steps/day, and baseline score on the Facebook Intensity scale. For the Standard Walking Intervention, only intervention adherence and baseline steps/day were entered as predictor variables. All analyses were completed using SPSS 21.0 and SAS v9.3. Significance was set at an alpha level of $P < .05$.

Results

A total of 63 full-time, female college freshmen (18.6 ± 0.7 years; 77.8% White, 11.1% Black, 6.3% Asian, and 4.8% Hispanic) completed this study. Among women in this study who reported working ($n = 28$), the average time spent working was 12.2 ± 5.8 hours per

week in addition to attending school full-time. Reported number of hours worked per week and number of credits taken by women in the Standard Walking Intervention and women in the Facebook Social Support Group did not significantly differ. On average, women in this study had used Facebook for 4.6 ± 1.2 years and reported spending an average of 1.8 ± 2.7 hours per day on Facebook. Participants' average score on the Facebook Intensity Scale was 3.6 ± 0.9 on a scale ranging from 1 to 5. In addition, women in this study reported having an average of 648 ± 407 Facebook friends. There were no significant differences between intervention groups among these baseline Facebook variables.

Women in the Facebook Social Support Group and the Standard Walking Intervention did not differ on anthropometric measures at baseline. Average BMI among women in this sample was 24.3 ± 4.6 kg/m². About 73% (n = 46) of the women in this sample had BMI values that classified them as normal weight, 14.3% (n = 9) were classified as overweight, and 12.7% (n = 8) were classified as obese.³⁴ The women in this study had an average waist circumference (mean = 75.3 ± 11.6 cm) compared with a nationally representative sample. About 10% (n = 9) of the women in this sample

had a waist circumference in the high range with the remaining 90% (n = 54) having a waist circumference in the acceptable range.³⁴

The number of individuals with step data at each time point for each group is provided in Table 1 together with mean steps, standard deviations, and tests of simple main effects comparing the treatment conditions at each time point. As can be seen in Table 1, the rate of attrition did not differ significantly between the groups for any week in the study. A test of the simple main effect for treatment condition at baseline indicated that the 2 groups did not differ significantly in steps/day at baseline ($F_{(1,119)} = 0.23$, $P = .63$; Table 1). A significant main effect for time was present ($F_{(8,425)} = 94.43$, $P < .001$), indicating an average increase in steps per day across intervention groups over the course of the study. The group by time interaction was also significant ($F_{(8,425)} = 3.78$, $P < .0004$), demonstrating that the women in the Facebook Social Support Group differed from women in the comparison in the number of steps per week over time.

Inspection of the means (Figure 2) indicated that the women in the Facebook Social Support Group began to diverge from women in the Standard Walking Intervention between weeks 1 and 2 with

Table 1 Mean Weekly Steps per Day by Intervention Group and Time

Week	Standard Walking Intervention		Facebook Social Support Group		Tests of simple main effects for group by time
	n	Mean (SD)	n	Mean (SD)	
0	31	5595.10 (1729.48)	32	5295.22 (1457.75)	$F_{(1,119)} = 0.23$, $P = .63$
1	30	7011.00 (2102.21)	31	6940.29 (2182.91)	$F_{(1,122)} = 0.05$, $P = .83$
2	29	7519.21 (2513.35)	28	8166.29 (2299.59)	$F_{(1,128)} = 0.64$, $P = .42$
3	28	7993.46 (2195.95)	29	8295.24 (2002.07)	$F_{(1,128)} = 0.09$, $P = .76$
4	28	8889.25 (2566.74)	26	9260.50 (2445.03)	$F_{(1,134)} = 0.43$, $P = .51$
5	27	9225.59 (2970.24)	29	9911.97 (2495.06)	$F_{(1,130)} = 1.28$, $P = .26$
6	25	9535.56 (2990.82)	27	10,417.70 (2723.30)	$F_{(1,138)} = 1.73$, $P = .19$
7	26	10,455.62 (2914.19)	24	11,604.79 (2752.37)	$F_{(1,142)} = 4.21$, $P = .04$
8	25	10,135.64 (3316.37)	27	12,472.44 (2816.61)	$F_{(1,138)} = 11.34$, $P < .001$

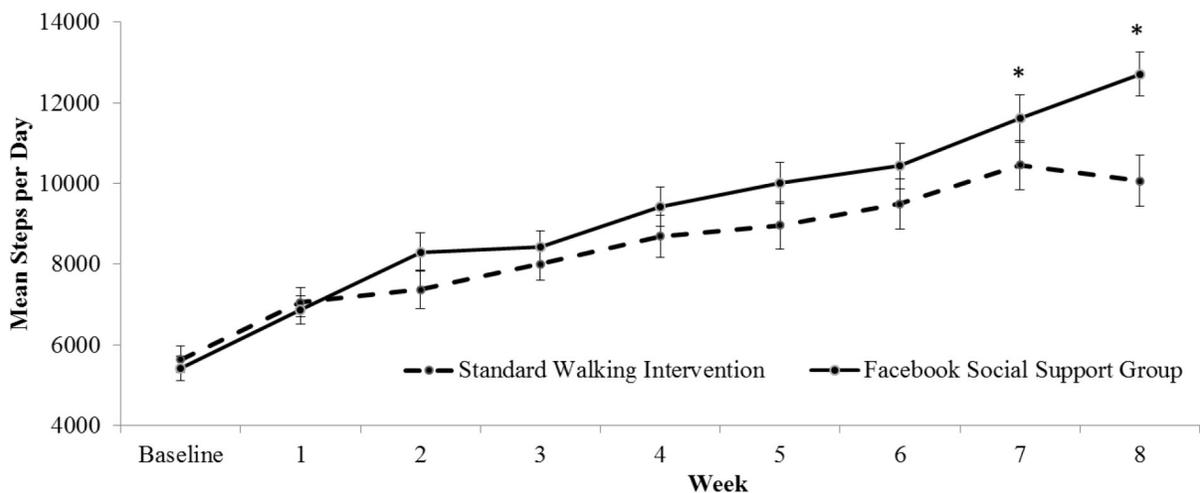


Figure 2 — Mean weekly steps/day by intervention group. Note. * indicates significant difference ($P < .05$) between groups.

the difference becoming larger after week 4. Simple main effect comparisons of the intervention groups at each time point, however, were significant only at weeks 7 and 8.

There were no significant changes in anthropometric variables in response to the intervention for women in the Standard Walking Intervention. Women in the Facebook Social Support Group significantly decreased waist circumference ($t_{(2,24)} = 3.25, P = .003$) by 1.1 cm at the completion of the intervention compared with baseline.

Results of a multiple linear regression analysis demonstrated that, among the variables included in the model, the only significant predictor of change in steps/day (week 8- baseline) for women in the Facebook Social Support Group was baseline physical activity steps/day ($\beta = -.73, t_{(22)} = -5.09, P < .001$). Baseline steps/day was also a significant predictor of increases in steps/day for women in the Standard Walking Intervention ($\beta = -.61, t_{(23)} = -3.53, P = .002$). More specifically, among participants in both groups, the lower the

baseline physical activity level, the greater increases in steps/day as a result of the intervention. The majority of participants in both groups received all 8 step goals throughout the intervention (Figure 3). However, for women in both groups, adherence to the intervention (Figure 3) did not predict change in steps/day. Despite decreasing levels of engagement (Figure 4) throughout the intervention, this factor was not a significant predictor of change in physical activity.

Discussion

The aim of this study was to examine the efficacy of a Facebook Social Support Group to increase physical activity in young women. Our hypothesis, that women enrolled in the Facebook Social Support Group would increase steps/day significantly more than women enrolled in a Standard Walking Intervention, was supported. Women in the Standard Walking Intervention significantly increased

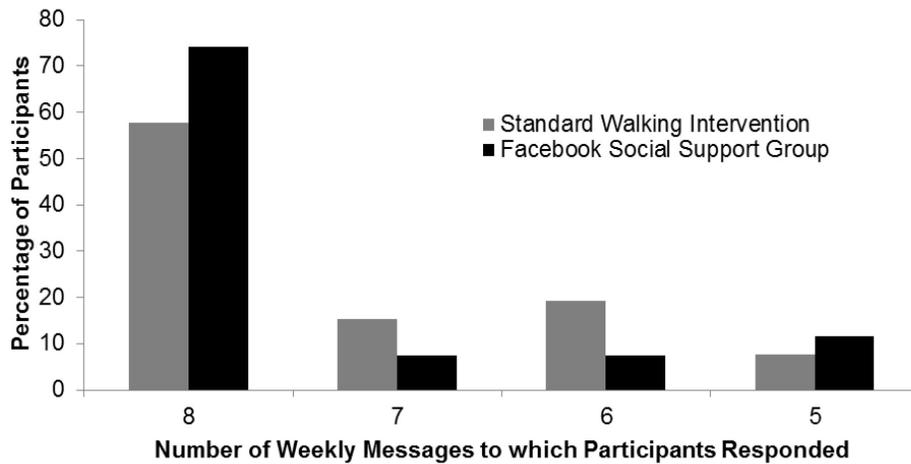


Figure 3 — Number of step goals received by participants.

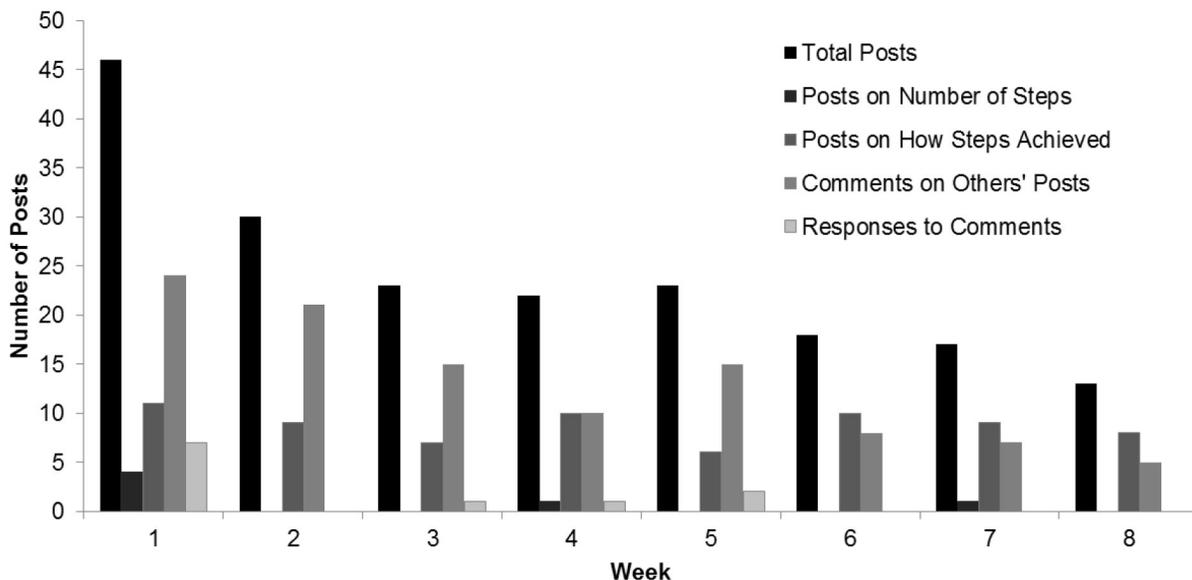


Figure 4 — Facebook posts per week among Facebook Social Support Group (n = 27).

physical activity by about 80% above baseline which is similar to that seen in prior studies using pedometers in college students.^{35,36} However, women in the Facebook Social Support Group increased physical activity by 136% (from 5295 to 12,472 steps/day) over the course of the 8-week intervention. This increase was 2636 steps/day more than women in the Standard Walking Intervention and would equate to about an additional 1.3 miles, or about 26 minutes, of walking per day (at a 3 mph pace). These findings are statistically significant and also have clinical significance given the established dose-response relationship between energy expended through walking and reduced risk of cardiovascular disease,³⁷ type 2 diabetes,³⁸ breast cancer,³⁹ and colon cancer.⁴⁰

Previous reviews of the literature set on physical activity interventions using social media to increase physical activity have rightfully concluded that results are inconclusive.²¹ Results from the current study provide further evidence that Facebook may be a useful platform for an intervention to increase physical activity; however, there may be specific characteristics of this type of intervention that make it efficacious. While a recent study using a similar sample population found an intervention using Facebook to be no more effective than an education only intervention,²² key differences in methodological design may have contributed to the discrepant results between the current study and this prior investigation. It has been well-established that the method of delivery of a physical activity intervention can influence its success.⁴¹ The fact that participants in the study by Cavallo and colleagues²² were required to visit a stand-alone intervention website (in addition to Facebook) while participants in the current study participated by using Facebook only, may have resulted in greater exposure to the intervention and thus contributed to the differing results. For example, Cavallo and colleagues²² reported that participants in the intervention using Facebook logged into the other educational website every 2 weeks of the intervention. Although we were unable to track login frequency in the current study to the Facebook Social Support Group page, participants averaged just over 7 posts each to this page during the course of the intervention. Thus, at the very least, participants in the Facebook Social Support Group were exposed to intervention materials about each week of the intervention as opposed to every other week. Taking these results together with those of Cavallo and colleagues, efficacy of a physical activity intervention using Facebook may be improved by not requiring participants to visit a separate website (other than Facebook) for intervention materials.

Integrating the results from the current investigation with those of another previous intervention²³ indicate that the creation of a social support group is pivotal to the success of physical activity interventions using Facebook. Valle and colleagues,²³ who compared 2 Facebook-based physical activity interventions in young cancer survivors, found that participants enrolled in the intervention that included more extensive intervention strategies increased total self-reported physical activity by 161 more minutes per week than participants in a comparison group with fewer intervention strategies. The more in-depth intervention strategies included expanded behavioral lessons on physical activity, tracking, goal-setting and feedback on physical activity, and a Facebook social support group. One or more of these strategies may have resulted in the improved efficacy of the intervention. In the current study, there were also greater increases in physical activity among participants in the intervention with more in-depth intervention strategies. However, while both interventions included educational information on physical activity as well as tracking, goal-setting and feedback on physical activity, the intervention that also included a social support group on Facebook was significantly more efficacious. Thus, in the current

study and in the prior study by Valle and colleagues, the intervention including a social support group resulted in greater increases in physical activity, pointing to the importance of this component within physical activity interventions using Facebook.

When developing this social support group on Facebook to increase physical activity, the size of the social support group may be important to consider. Intervention group size can influence the success of an intervention with the ideal group size to facilitate social support being 5 to 9 individuals.³⁰ Groups that are larger than this size risk overloading individuals with information (eg, if someone has to sort through over 20 posts on the group page every day), while groups that are smaller than 5 individuals may risk not supplying sufficient levels of social support (eg, if only 2 individuals post regularly). In total, 64 students were enrolled in 1 Facebook group promoting physical activity in the study by Cavallo and colleagues.²² In the current study, Facebook groups were limited to 8 participants and the intervention leader. The average number of posts per day to the Facebook social support pages was 1 post per day, and thus, was very manageable with regard to the content participants viewed when logging into the page. Even if participants did not log into the page for several days, they were not bombarded with more than 5 to 6 posts to the page. Data were not available to calculate the number of posts per day to the Facebook group in the study by Cavallo and colleagues.²² However, it was reported that the intervention leader posted 60 pieces of content throughout the 12-week intervention which was in addition to 64 other participants posting to this group page. Thus, it is highly likely that the regularity of posts was well-beyond 1 per day. As aforementioned, Cavallo and colleagues²² found no added benefit of the use of Facebook to increase physical activity beyond education only. However, the large size of the Facebook group may have been a deterring factor. Given the success of the current study, future studies may benefit from maintaining smaller Facebook social support groups (ie, 5 to 9 participants) within physical activity interventions.

To understand potential mechanisms related to the efficacy of this intervention, several factors were explored. Results demonstrate that baseline physical activity level was predictive of change in steps/day throughout the intervention for women in both groups. These data support the idea that inactive or insufficiently active individuals should be specifically targeted because they have the greatest need for increases in physical activity to promote good health, and they will likely have the largest increases in physical activity upon completion of an intervention.⁴² Despite the fact that previous studies have demonstrated a relationship between intervention adherence and the success of a physical activity intervention,⁴³ adherence was not predictive of change in steps/day. However, there may be a threshold for intervention adherence that was reached in this study, beyond which further increases in steps/day were not seen. This threshold, however, has not yet been defined for intervention adherence in previous research. It is also possible that a different measure of adherence may have been predictive of change in physical activity. In their review, Donkin and colleagues⁴³ found that logins was the measure of adherence most consistently related to outcomes in physical health interventions, and thus, it is possible that the number of logins to Facebook may have been predictive of change in physical activity in the current study. Future studies, upon availability of this measure, may benefit from examining the effect of number of Facebook logins and degree of intervention success. Baseline Facebook usage also did not predict change in steps/day suggesting that, although college students use Facebook to varying degrees, this may not impact the success of physical activity interventions delivered via Facebook. There is also the

potential that certain aspects of Facebook usage that are pertinent to a physical activity intervention were not adequately assessed using the Facebook Intensity scale, such as the willingness to participate in a Facebook common interest (physical activity) group.

As has been seen in prior physical activity interventions delivered through the internet,^{13–16} engagement declined as the intervention progressed. Although all participants engaged in the Facebook Social Support Group, there was also a wide range of engagement with a minimum of 6 total posts to a maximum of 32 total posts. However, this factor did not influence actual change in steps/day. It should be noted, however, that Facebook posts were not the only form of engagement in this intervention. Participants may have visited the group but not posted to the group page. In doing so, they would still receive the information that was on the page as well as the support from other members of the group. However, examining the impact of this form of engagement on increases in physical activity is not currently feasible, as an objective measure of how many times an individual visits a Facebook group page is currently not available.

Combining current findings with previous research indicates that a Facebook Social Support Group promoting increases in physical activity can be effective to increase physical activity among young adults, particularly women. However, these increases may require that participants do not have to visit a separate website to obtain additional elements of the intervention and that groups are kept fairly small (approximately 8 to 9 members).

Some limitations must be considered when interpreting the results of this study. Only female college freshmen living in on-campus dormitories who actively used Facebook were included in this sample. Future studies should include more diverse samples of individuals. In addition, future studies would also benefit from including larger sample sizes to allow for greater statistical power which may provide a more clear indication of the potential effect of a Facebook Social Support Group. Another limitation within this study is the fact that, although they were using an objective measure of physical activity (pedometer), participants were required to track their own steps and report these back to the intervention leader. Thus, tracking and reporting of steps may have been subject to social desirability bias.²⁴ Also, there was face-to-face contact between participants and the intervention leader during baseline and post intervention assessments. The benefit of using social media to deliver and facilitate a physical activity intervention is that a large number of people can be reached over a wide range of locations. Thus, researchers have called for the need to examine internet-based physical activity interventions that do not include or require face-to-face contact between participants and intervention leaders.⁴⁴ Face-to-face contact was required for this study to collect anthropometric data and collect baseline physical activity level (with a sealed pedometer provided to participants). However, future interventions are warranted to investigate interventions using social media without initial face-to-face contact. In addition, the duration of this intervention may have limited the ability to detect the potential magnitude of change in steps/day. Finally, this study did not include a follow-up analysis, and thus, it is unknown as to whether physical activity levels were maintained over time. Future studies of longer duration that include a follow-up are warranted.

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