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Facebook for Supporting a Lifestyle Intervention for People with Major Depressive Disorder, Bipolar Disorder, and Schizophrenia: An Exploratory Study

John A. Naslund, MPH^{a,b,c}, Kelly A. Aschbrenner, PhD^{b,d}, Lisa A. Marsch, PhD^{c,d}, Gregory J. McHugo, PhD^d, and Stephen J. Bartels, MD, MS^{a,b,d,e}

^aThe Dartmouth Institute for Health Policy and Clinical Practice, Dartmouth College, Lebanon, NH, United States

^bHealth Promotion Research Center at Dartmouth, Lebanon, NH, United States

^cThe Center for Technology and Behavioral Health, Dartmouth College, Lebanon, NH, United States

^dDepartment of Psychiatry, Geisel School of Medicine at Dartmouth, Lebanon, NH, United States

^eDepartment of Community and Family Medicine, Geisel School of Medicine at Dartmouth, Lebanon, NH, United States

Abstract

Objective—To examine whether Facebook could support a community-based group lifestyle intervention for adults with serious mental illness.

Methods—Participants with serious mental illness and obesity enrolled in a 6-month group lifestyle program were invited to join a secret Facebook group to support their weight loss and physical activity goals. Two peer co-facilitators moderated the Facebook group. The proportion of participants who achieved 5% weight loss or improved fitness was measured at follow-up. The relationship between this outcome and participants' interactions in the Facebook group was examined. Interactions were defined as active contributions including posts, comments, or likes. Content of participants' Facebook posts was also explored.

Results—Participants ($n=25$) had major depression (44%), bipolar disorder (36%), and schizophrenia (20%). Nineteen (76%) participants joined the Facebook group, and contributed 208 interactions (70 posts; 81 comments; 57 likes). Participants who achieved 5% weight loss or improved fitness contributed more interactions in the Facebook group (mean=19.1; SD=20.5)

Corresponding Author: John A. Naslund, MPH, 46 Centerra Parkway, Lebanon, NH, United States, 03766. Telephone: 617-480-0277
john.a.naslund@dartmouth.edu.

Compliance with Ethical Standards:

Conflict of Interest: Lisa A. Marsch is a partner with HealthSim, LLC and Square2, Inc. These relationships are managed exclusively by Dartmouth College. This manuscript does not reference in any way the products of these entities. All remaining authors report no conflicts of interests.

Ethical approval: All procedures performed in this study involving human participants were in accordance with the ethical standards of the Dartmouth College Committee for the Protection of Human Subjects and the New Hampshire Department of Health and Human Services, and with the 1964 Helsinki declaration and its later amendments.

Informed consent: Informed consent was obtained from all individual participants included in this study.

compared to participants who did not (mean=3.9; SD=6.7), though this relationship approached statistical significance ($t=-2.1$; Welch's $df=13.1$; $p=0.06$). Participants' posts containing personal sharing of successes or challenges to adopting healthy behaviors generated more interaction compared to posts containing program reminders ($p<0.01$), motivational messages ($p<0.01$), and healthy eating content ($p<0.01$).

Conclusions—Facebook appears promising for supporting health behavior change among people with serious mental illness. These findings can inform social media initiatives to scale up health promotion efforts targeting this at-risk group.

Keywords

Facebook; social media; serious mental illness; lifestyle intervention; weight loss; fitness

Introduction

Cardiovascular disease is the leading cause of the dramatically reduced life expectancy among people with serious mental illnesses including major depressive disorder, bipolar disorder, and schizophrenia [1]. Addressing this early mortality disparity is a major public health priority. Obesity is a significant contributor to poor cardiovascular health. In the United States obesity affects over 50% of people with major depressive disorder [2], as many as 61% of people with bipolar disorder [3], and about 59% of people with schizophrenia [4]. Obesity is an important risk factor for metabolic syndrome, which affects roughly one third of people with serious mental illness [5]. Treatment of obesity in people with serious mental illness is especially challenging due to metabolic effects of psychiatric medications, impact of mental health symptoms on motivation, poverty, limited access to safe and affordable opportunities to participate in physical activity, and poor dietary habits [6].

Intensive efforts to address high obesity prevalence among people with serious mental illness can achieve clinically significant reductions in cardiovascular risk as reflected by recent randomized controlled trials of lifestyle interventions promoting healthy eating and exercise [7–10]. However, many of these lifestyle interventions are resource intensive and only engage participants in active health behavior change activities during weekly group or individual sessions taught by health coaches, fitness trainers, or dietitians. These factors limit the reach of these evidence-based practices beyond clinical or professional settings, and are unlikely to substantively influence participants' health behaviors in their home environments and natural settings. Many of the lifestyle behaviors that contribute to obesity likely persist beyond the time-limited, in-person sessions of standard behavioral weight loss programming, and poor lifestyle habits such as sedentary behaviors and unhealthy dietary choices are often influenced by social surroundings [11]. Popular social media may provide a scalable and low-cost approach to enhance efforts aimed at promoting healthy eating and exercise among people with serious mental illness during their home, work, or leisure hours. Furthermore, social media could allow individuals with serious mental illness to give or receive support and encouragement from others who are also working towards adopting positive lifestyle behaviors.

Social media has become an increasingly important fixture in the daily lives of people with serious mental illness, and recent studies have reported that these individuals use social media to connect with others with similar mental health conditions, provide and receive social support, and search for health related information [12, 13]. Facebook is the most popular social media platform [14], and may offer promise for supporting health promotion interventions for people with serious mental illness, given its wide reach and ease of access from most mobile devices with connection to the Internet. Recent pilot work demonstrated that individuals with serious mental illness expressed satisfaction with using a secret Facebook group for supporting a community-based group lifestyle intervention [15]. The secret group was only visible and accessible to participants enrolled in the lifestyle program. However, it is not clear whether using social media to enhance in-person lifestyle interventions for people with serious mental illness is associated with improvement in clinically meaningful outcomes.

In this exploratory study, participants with serious mental illness enrolled in a community-based group lifestyle intervention were invited to join a secret Facebook group aimed at promoting group support towards achieving weight loss and physical activity goals. This study examined whether actively engaging in the Facebook group over the 6-month study duration was associated with clinically significant weight loss and fitness outcomes. It was hypothesized that more interactions within the Facebook group would be associated with achieving clinically significant reduction in cardiovascular risk, defined as 5% weight loss or improved fitness. Content of participants' posts in the Facebook group was also characterized and the number of interactions generated by the different types of topics was explored.

Methods

Participants and setting

Participants were enrolled in a 6-month group-based lifestyle intervention for weight loss delivered through an urban community mental health center in New Hampshire. Participants were deemed eligible if they had a serious mental illness defined by an axis I diagnosis of major depressive disorder, bipolar disorder, schizophrenia, or schizoaffective disorder and had obesity defined as body mass index (BMI) ≥ 30 kg/m². Eligible participants were also age 21 or older; were on stable pharmacological treatment defined as receiving the same psychiatric medications over the past 2 months; and spoke English. Exclusion criteria consisted of any medical contraindication to weight loss; pregnant or planning to become pregnant within the next 6 months; or current diagnosis of an active alcohol-use or substance-use disorder. Prior to starting the lifestyle program, participants received medical clearance from a primary care provider and had to be able to walk at least one city block. Committees for the Protection of Human Subjects at Dartmouth College and the New Hampshire Department of Health and Human Services approved all study procedures.

Group-based lifestyle program

The lifestyle program consisted of one weekly group weight management session facilitated by two lifestyle coaches and two optional group exercise sessions led by a certified fitness

trainer each week. The group weight management sessions were designed to be highly interactive and emphasized principles of healthy eating and exercise through hands-on activities, group discussions and teamwork exercises where participants worked together to plan healthy meals and overcome challenges to adopting healthier lifestyles. The optional group exercise sessions were led by a certified fitness trainer and involved stretching, resistance training, and cardio exercises tailored to the needs of obese sedentary adults. These sessions were held at a community location and were intended to help participants work towards reaching 150 minutes of exercise each week. In addition, participants received 3–5 text messages from research staff each week as reminders to attend the group weight management class and exercise classes, and to provide encouragement for being more active and eating healthier foods. Participants were also given Fitbit wearable activity tracking devices and were encouraged to set daily step goals during the weekly weight management sessions. A more detailed description of the lifestyle program is available elsewhere [16, 17].

Secret Facebook group

The lifestyle program also included a secret Facebook group to allow participants to connect and support each other towards achieving their healthy eating and exercise goals outside of weekly in-person group sessions. The “secret” feature on Facebook was used so that the group was only accessible and visible to participants enrolled in the lifestyle program. Participants could post or share content such as text, photos, or videos, view posts, click ‘like’ to show that they enjoy a post, or post comments. All interactions in the Facebook group were visible only to other members of the group. Participants were introduced to the secret Facebook group during the sixth week of the program. This allowed participants to meet in person first and to get to know each other so that they would feel more comfortable and interested in interacting with each other online. The lifestyle coaches led a 30-minute instruction session to provide participants with an overview of the ground rules for using the Facebook group. Participants were instructed to only post content related to healthy eating and exercise that was informative, supportive and encouraging, and that described personal successes or challenges towards achieving lifestyle goals. Participants were asked not to post personally identifying information such as an address or phone number, photos of other people without their permission, photos of children, grandchildren or other family members, or any hurtful or rude comments.

Two peer co-facilitators assisted with moderating the secret Facebook group. The peers were also individuals living with serious mental illness who were working towards making healthy lifestyle changes. The peers were instructed to regularly post content in the Facebook group related to the lifestyle program, such as tips for healthy eating and exercise, as well as encouraging messages to support healthy lifestyle behaviors. The peers also frequently posted comments or provided encouragement in response to participants’ posts. Study staff also posted content related to topics covered in the group sessions, reminders to exercise, and tips for healthy eating. The lifestyle coaches and certified fitness trainer were members of the secret Facebook group, and periodically posted helpful reminders about weekly group exercise classes or commented on participants’ posts by providing encouragement or helpful feedback.

Study staff met with participants new to Facebook to provide help with setting up an account and additional instruction regarding safety precautions of sharing personal information online. In the secret group feature on Facebook, study staff could ensure that only participants enrolled in the study could view, access, or share content and if necessary could delete posts or comments, or remove participants from the group. Study staff monitored the Facebook group at least 3 times each week to ensure that content posted by participants was consistent with the program objectives. Participants had access to ongoing technical support for using Facebook as needed.

Theoretical framework

The secret Facebook group was embedded as a component of a larger community-based group lifestyle intervention informed by social cognitive theory [16, 17]. The Facebook group was used to reinforce content from weekly group sessions aimed at increasing participants' self-efficacy for adopting healthy lifestyle behaviors. For example, the Facebook group served as a platform for social modeling, where participants could obtain new knowledge by learning from each others' successes and challenges with meeting weight loss and physical activity goals [18]. Additionally, the Facebook group could facilitate verbal or social persuasion outside of regular meetings, which involves providing encouragement and helping individuals feel confident that they can adopt healthy lifestyle behaviors [18].

Measures

Facebook interactions—Interactions in the secret Facebook group were defined as any type of active contribution. As opposed to passively viewing content, interactions required that participants actively post content, engage in discussion with other participants through comments, or indicate that they find content interesting or enjoyable by clicking 'like'. Facebook interactions were calculated as the sum of participants' posts, likes, and comments. Interaction on Facebook has been similarly defined in previous research [19].

Reduction in cardiovascular risk—This measure was defined as either 5% weight loss or improved fitness. The proportion of participants who achieved 5% weight loss was calculated at 6-months, which is considered clinically significant because modest weight loss is associated with reduction in cardiovascular risk among overweight and obese individuals [20, 21]. Improved fitness was calculated as the proportion of participants who achieved an increase in distance >50 meters on the 6-Minute Walk Test (6-MWT) at 6-months. The 6-MWT measures the distance in meters that an individual can walk in six minutes and is considered a reliable and valid measure of fitness [22, 23] and has demonstrated reproducibility in people with serious mental illness [24]. An increase of at least 50 meters is considered clinically significant because it is associated with a reduction in cardiovascular risk [25].

Group attendance—Participants' attendance at the weekly in-person group weight management sessions was also measured over the 6-month study duration (24 possible sessions).

Analytic approach

Baseline characteristics and attendance at the weekly in-person group weight management sessions was compared between participants who joined the secret Facebook group and those who did not using chi-square tests for categorical variables and t-tests for continuous variables. The primary hypothesis (interaction within the Facebook group would be associated with clinically significant reduction in cardiovascular risk) was tested by comparing mean number of Facebook interactions among participants who achieved (versus those who did not achieve) clinically significant reduction in cardiovascular risk at 6-months using Welch's t-tests to account for unequal variance between groups. Among participants who joined the group, Pearson's correlation coefficients (r) and p -values were calculated to examine the association between attendance at weekly in-person group weight management sessions and number of Facebook interactions.

A two-step process was used to explore how many interactions were generated by each of the different types of post topics. First, posts were exported from the Facebook group into Atlas.ti qualitative data analysis software and categorized into seven broad topic areas. These topics included: 1) healthy eating (posts containing tips or recommendations about healthy eating); 2) exercise (posts containing information about being physically active); 3) program reminders (reminders to attend weekly group weight management or exercise classes); 4) community events (posts about events happening in the community such as charity walks, festivals, farmers markets, or Zumba classes in a local park); 5) personal sharing (posts where participants shared personal successes or challenges with achieving health behavior change); 6) motivation (posts containing motivational or inspirational quotes or images); and 7) humor (posts containing cartoons or funny images). Second, the number of interactions including comments and likes generated by each of the posts was calculated. One-way ANOVA was used to determine whether there were differences in the number of interactions generated by the different categories of post topics. Bonferroni correction was used to account for multiple comparisons between the seven topic categories in post-hoc tests. All analyses were performed using Stata 14. A p -value ≤ 0.05 was considered statistically significant.

Results

Participant characteristics

Twenty-five participants completed 6-month post-intervention assessments. Initially, 32 participants enrolled in the lifestyle intervention; however, 7 participants stopped participation due to active substance use ($n=1$), hospitalization ($n=1$), pregnancy ($n=1$), not interested ($n=2$), and lost to follow-up ($n=2$). The 25 participants did not differ on any baseline characteristics from the 7 participants who stopped participation. Baseline characteristics for the 25 participants included in this study are listed in Table 1. Participants had a mean age of 49.2 years ($SD=11.8$), were 52% female, predominantly living independently (80%) or with family (16%), and had a mean BMI of 37.3 kg/m^2 ($SD=8.1$). Participants were enrolled in three separate in-person weight management groups to account for rolling recruitment, but attended the same optional group exercise sessions and joined the same secret Facebook group for the program duration.

Use of the secret Facebook group

Nineteen participants (76%) enrolled in the lifestyle program chose to join the secret Facebook group. As highlighted in Table 1, a greater proportion of these participants were female compared to those who did not join the Facebook group (63% vs. 17%; $\chi^2=3.95$; $p<0.05$). Among these 19 participants, 12 were already active Facebook users before enrolling in this study, and 7 were new to Facebook. Among the 6 participants who chose not to join the Facebook group, 3 were active Facebook users and 3 had never used Facebook. Participants' primary reasons for not joining the Facebook group included not being interested, finding it too difficult to use, and having preference for face-to-face interaction. One participant mentioned concerns about privacy as a reason for not joining the Facebook group.

The secret Facebook group was active from March to December 2015, during which time there were 956 interactions consisting of 326 unique posts, 275 comments, and 355 likes. Participants ($n=19$) contributed 208 interactions with an average of 13.0 (SD=17.2) interactions per participant. This included 70 posts (mean=4.0, SD=7.3 per participant), 81 comments (mean=5.0, SD=7.3 per participant), and 57 likes (mean=4.0, SD=4.9 per participant). The two peer co-facilitators contributed 526 interactions consisting of 209 posts, 173 comments, and 144 likes. Lastly, study staff and lifestyle coaches contributed 222 interactions, including 47 posts, 21 comments, and 154 likes. At no point during the study did any participants post hurtful or rude content in the Facebook group.

Facebook interactions and cardiovascular risk

Table 2 highlights the association between interactions in the Facebook group and clinically significant reduction in cardiovascular risk (5% weight loss or improved fitness). Among the 19 participants who joined the Facebook group, a trend emerged where those who achieved clinically significant reduction in cardiovascular risk contributed more interactions in the Facebook group compared to participants who did not. This relationship approached statistical significance ($t=-2.12$; Welch's $df=10.13$; $p=0.06$). The relationship between achieving 5% weight loss and interactions in the Facebook group also approached statistical significance, while the relationship between improved fitness and interactions in the Facebook group was not significant.

Group attendance and Facebook use

Attendance at the weekly in-person group weight management sessions appeared higher among participants who joined the Facebook group (mean=17.3 sessions, SD=7.3) compared to those who did not (mean=14.6 sessions, SD=6.6), though this difference was not significant. Among participants who joined the Facebook group, there was no association between attendance at the in-person group sessions and number of interactions in the Facebook group.

Content posted to the Facebook group

Healthy eating was the most common topic of the Facebook posts, accounting for 97 (30%) posts, followed by program reminders ($n=61$; 19%), personal sharing ($n=58$; 18%), humor ($n=43$; 13%), exercise ($n=26$; 8%), community events ($n=22$; 7%), and motivation ($n=17$;

5%). Table 3 shows the number of Facebook interactions (i.e., comments and likes) for each of the different post topics. Posts involving personal sharing generated the greatest response with an average of 3.76 interactions (SD=3.15) per post. After adjusting for multiple comparisons, personal sharing generated significantly more interactions compared with posts containing program reminders ($p<0.01$), motivational messages ($p<0.01$), and healthy eating content ($p<0.01$). There were no other differences in the number of Facebook interactions between the different topic types.

Discussion

Facebook appeared promising for supporting community-based weight loss efforts among people with serious mental illness. About three quarters of participants chose to join a secret Facebook group as part of a lifestyle program, and contributed 208 interactions, including 70 posts, 81 comments, and 57 likes. Participants who achieved clinically significant reduction in cardiovascular risk, defined as 5% weight loss or improved fitness, appeared to contribute more interactions to the Facebook group compared to participants who did not achieve this outcome, though this relationship was not statistically significant. Interacting in the Facebook group was not associated with attendance at weekly in-person group weight management sessions, suggesting that use of the Facebook group may not have been an indicator of overall program engagement. It may also reflect that participants who were unable to attend in-person sessions were able to remain connected to the program by interacting with other participants in the secret Facebook group. The findings reported here are preliminary and therefore should be interpreted cautiously. Nonetheless, this exploratory study yields valuable insight regarding potential for social media to enhance in-person health promotion programs targeting this high-risk group.

The finding that reduction in cardiovascular risk may be associated with more frequent interaction on social media is consistent with prior studies. One study found that frequency of posts on Twitter was associated with weight loss [26], while another found that greater engagement within a Facebook group contributed to weight loss [27]. Likes were the most common form of interaction among participants, which was similarly observed in an analysis of college students' engagement with a Facebook page for weight loss [28].

Participants' posts contained content covering several different topics such as healthy eating, reminders to attend in-person group sessions, personal sharing about successes and challenges of health behavior change, humor, exercise, community events, and motivational messages consisting of inspirational quotes or images. Posts involving personal sharing of successes and challenges related to adopting a healthy lifestyle generated greater response from other participants in the form of more likes and comments when compared to posts containing program reminders, motivational messages, and healthy eating content. This suggests that encouraging participants to share their personal experiences within a secret Facebook group for healthy lifestyle change may be important for generating greater response and engagement. It is possible that the larger community-based lifestyle intervention in this study emphasized the role of peer-to-peer support for health behavior change [16]. Most participants were committed to working together to achieve weight loss and physical activity goals, and many had the opportunity to get to know each other during

weekly in-person group sessions. As a result, participants may have felt comfortable interacting with each other online, and may have been more interested in and more likely to respond to each other's posts describing personal experiences.

Two peers who were also working on making healthy lifestyle changes moderated the Facebook group, which may have created a comfortable environment for participants to support each other. Research shows that peers can support intervention delivery by bringing credibility and by sharing lived experiences as trusted role models for individuals with serious mental illness [29]. The Facebook component may help facilitate peer-to-peer support for health behavior change among individuals with serious mental illness as part of a larger in-person health promotion program delivered within a community mental health setting. Future research is necessary to determine whether an intervention delivered entirely through social media could similarly allow participants with serious mental illness to support and encourage each other while contributing to meaningful cardiovascular health benefits.

Social media may not be a suitable lifestyle intervention component for all individuals with serious mental illness. Six participants declined to join the Facebook group mainly because of disinterest or dislike of online programs, one participant did not join because of privacy concerns, and one participant experienced difficulty understanding how to use social media. This is a reminder that while Facebook or other social media may serve as valuable tools for enhancing in-person health promotion programs, these digital platforms may not extend reach of efforts to all individuals. This further emphasizes the need for multiple approaches tailored to individuals' specific needs, preferences, and capabilities to successfully support health behavior change in this at-risk group.

Limitations

Several limitations should be considered. First, this study had a small sample size that lacked racial or ethnic diversity, and therefore these findings may not generalize to other community mental health settings. Second, analyses presented here were based on program participants who completed 6-month follow-up assessments, and therefore it is not possible to determine if participants who dropped out of the study would have engaged in the Facebook group or not. However, participants who dropped out did not differ from completers on any baseline characteristics. Third, given that this was an exploratory study, the statistical tests in this study were underpowered; therefore, the results should be interpreted cautiously. Lastly, all participants were receiving services through community mental health settings, indicating that these findings are likely not representative of individuals with serious mental illness not currently receiving services or in other settings.

Conclusions

This exploratory study contributes to a growing research supporting the use of social media for health promotion [30]. These findings expand on a prior feasibility study by highlighting that Facebook may be valuable for enhancing community lifestyle interventions for individuals with serious mental illness [15]. Greater interaction among participants within a secret Facebook group may be associated with reduction in cardiovascular risk, though larger studies are necessary to explore this association. When participants shared personal

successes and challenges with changing lifestyle habits it generated greater response from others in the group. This suggests that social media may facilitate peer-to-peer support for health behavior change among individuals with serious mental illness enrolled in community lifestyle interventions. It may be possible to leverage the popularity, ease of access, and widespread reach of social media to substantially expand health promotion efforts and connect individuals with serious mental illness with supportive and encouraging online networks. Future research is necessary to explore how online peer-to-peer relationships could support initiatives to address cardiovascular risk factors, and whether these online relationships could serve as sustainable long-term support systems towards living a healthy lifestyle among people with serious mental illness.

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Biographies

John Naslund, MPH, is a doctoral candidate at The Dartmouth Institute for Health Policy and Clinical Practice, Dartmouth College.

Kelly A. Aschbrenner, PhD, is an Assistant Professor of Psychiatry at the Geisel School of Medicine at Dartmouth.

Lisa A. Marsch, PhD, is a Professor of Psychiatry at the Geisel School of Medicine at Dartmouth, and Director of the Center for Technology and Behavioral Health.

Gregory J. McHugo PhD, is a Professor of Psychiatry at the Geisel School of Medicine at Dartmouth.

Stephen J. Bartels, MD, MS, is a Professor of Psychiatry and of Community & Family Medicine and of The Dartmouth Institute for Health Policy and Clinical Practice at Dartmouth College. Dr. Bartels is also Director of the Health Promotion Research Center at Dartmouth and the Dartmouth Centers for Health and Aging.

Table 1Baseline demographic and clinical characteristics of the participants^a

Characteristic	Total Sample (n = 25)	Joined the Facebook Group (n = 19)	Did not join the Facebook Group (n = 6)
<i>Demographic Characteristics</i>	N (%) or M ± SD	N (%) or M ± SD	N (%) or M ± SD
Age, years (M ± SD)	49.2 ± 11.8	50.5 ± 11.7	45.2 ± 12.1
Female (%) [*]	13 (52%)	12 (63%)	1 (17%)
Non-Hispanic white (%)	24 (96%)	19 (100%)	5 (83%)
Education			
Less than high school	3 (12%)	1 (5%)	2 (33%)
High school	6 (24%)	5 (26%)	1 (17%)
Some college	11 (44%)	8 (42%)	3 (27%)
College degree	5 (20%)	5 (26%)	0 (0%)
Living situation			
Living independently	20 (80%)	16 (84%)	4 (67%)
Living with family	4 (16%)	3 (16%)	1 (17%)
Assisted or supported housing	1 (4%)	0 (0%)	1 (17%)
Marital status			
Never married	9 (36%)	6 (32%)	3 (50%)
Currently married	4 (16%)	2 (11%)	2 (33%)
Previously married	12 (48%)	11 (58%)	1 (17%)
Currently Employed (part or full-time)	5 (20%)	4 (21%)	1 (17%)
Enrolled in Medicaid only	8 (32%)	6 (32%)	2 (33%)
Enrolled in Medicare only	8 (32%)	7 (37%)	1 (17%)
Dual Eligible (enrolled in Medicaid and Medicare)	9 (36%)	6 (32%)	3 (50%)
<i>Clinical Characteristics</i>			
Mental illness diagnosis (%)			
Major depressive disorder	11 (44%)	9 (47%)	2 (33%)
Bipolar disorder	9 (36%)	7 (37%)	2 (33%)
Schizophrenia spectrum disorders	5 (20%)	3 (16%)	2 (33%)
Weight, pounds (M ± SD)	228.2 ± 40.4	231.1 ± 45.9	219.0 ± 10.2
BMI, kg/m ² (M ± SD) [*]	37.3 ± 8.1	39.1 ± 8.5	31.5 ± 1.9
Fitness, 6-MWT ^b (M ± SD)	393.1 ± 125.8	379.0 ± 137.6	446.7 ± 34.9
Current smoker	4 (16%)	3 (16%)	1 (17%)

^aParticipants who joined the secret Facebook group were compared to participants who did not join the secret Facebook group on baseline characteristics using chi-square tests for categorical variables and Welch's t-tests for continuous variables.

^bFitness was measured using the 6-Minute Walk Test (6-MWT), which measures the number of meters that an individual can walk in 6 minutes. Higher values indicate better fitness.

^{*} $p < 0.05$

Association between number of interactions in the Facebook group and clinically significant fitness and weight loss outcomes from baseline to 6-months

Table 2

Clinically significant outcomes	n	Facebook Interactions (M ± SD)	t	Welch's df	p ^a
Cardiovascular risk reduction (>5% weight loss or >50 meter increase on the 6-MWT)					
Yes	9	19.1 ± 20.5	-2.12	10.13	0.06
No	9	3.9 ± 6.7			
Weight loss (>5%)					
Yes	7	23.0 ± 8.3	-2.26	6.68	0.06
No	12	3.9 ± 5.9			
Improved Fitness (>50 meter increase on the 6-MWT) ^b					
Yes	4	16.3 ± 23.9	-0.48	4.16	0.65
No	14	10.1 ± 4.0			

^a p-values from Welch's t-tests to account for unequal variance between participants who achieved clinically significant outcomes and those who did not.

^b Fitness was measured using the 6-Minute Walk Test (6-MWT), which measures the number of meters that an individual can walk in 6 minutes. An increase of 50 meters or greater is considered clinically significant improved fitness.

Table 3

Content of Facebook posts and number of interactions by type of post

Topic	Number of Posts (N)	Topic Definition	Example Posts ^d	Comments Per Post (M ± SD)	Likes Per Post (M ± SD)	Total Interactions Per Post (M ± SD) ^b
Healthy Eating	97	Posts containing tips or recommendations for healthy eating.	<p>“Eating healthy can be confusing sometimes. There are many foods that have a reputation for being healthy, but in reality they’re anything but. Here’s a little help…”</p> <p>“Here’s a healthy recipe for the warm temperatures: Grilled Corn, Avocado and Tomato Salad with Honey Lime Dressing.”</p>	0.44 ± 0.83	1.13 ± 1.12	1.58 ± 1.53
Program Reminder	61	Reminders to attend the weekly group weight management or exercise classes.	<p>“It’s a beautiful fall day and a great chance to come to exercise class! Reminder that exercise class is today at 1:30pm at the usual location, hope everyone can make it out!”</p> <p>“Members of Group 4 – just a reminder that your weekly classes are from 2:45–3:45 beginning tomorrow, with the weigh-in beginning at 2:30. See you tomorrow for a special guest presentation about local food resources! (Group 3 members, you are all welcome to stay after your class for Group 4’s session tomorrow, as well!)”</p>	1.18 ± 1.29	1.12 ± 1.25	2.30 ± 1.96
Personal Sharing	58	Posts where participants shared personal successes or challenges with achieving health behavior change.	<p>“Last week I lost a family member and went into a depression. I didn’t exercise and ate some stuff I shouldn’t have. But now I’m back and doing the best I can thank you for all the people that keep me going.”</p> <p>“Sorry I quit. I have a lot more problems than weight loss. Please pray for me and my healing, which is so much more important than weight loss. I wish for the best of most you. I have a lot more problems than weight loss.”</p>	2.03 ± 2.39	1.72 ± 1.85	3.76 ± 3.15 ^c
Humor	43	Posts containing cartoons or funny images.	<p>“The older you get, the tougher it is to lose weight, because by then your body and your fat are really good friends.” [caption included with a cartoon]</p> <p>“My goal was to lose 10 pounds this year. Only 15 to go.” [quote included with an image]</p>	0.40 ± 0.73	2.26 ± 1.56	2.65 ± 1.85
Exercise	26	Posts containing information about being physically active or getting exercise.	<p>“I had a great time at exercise group today going on a walk. So good to see you all again. Will see you again Monday!”</p> <p>“Working out in the pool is a great way to get in shape without putting a lot of stress on your joints, but swimming laps can be hard and boring. Try these moves instead!”</p>	1.62 ± 2.42	1.08 ± 1.06	2.69 ± 2.51
Community Events	22	Posts about events happening in the community such as charity walks, festivals, farmers markets, or Zumba classes held at a local park.	<p>“There is an event to learn how to be healthy and fit. It is going to be on Saturday September 19th from 11am to 2pm at the Mall. Health and fitness experts will be there, and they will be doing health screenings and other activities.”</p> <p>“Latino Festival tomorrow. It sounds like a fun event. It is a short walk from Main street so a good way to get some steps in.”</p>	0.82 ± 0.80	1.36 ± 0.85	2.18 ± 1.05
Motivation	17	Posts containing motivational or inspirational quotes or images.	<p>“Though no one can go back and make a brand new start, anyone can start from now and make a brand new ending.” [quote included with an image]</p> <p>“When you start doubting yourself, remember how far you have come. Remember everything you have faced, all the battles you have won, and all the fears you have overcome.” [quote included with a photo]</p>	0.47 ± 0.87	1.06 ± 0.90	1.53 ± 1.55

^aPersonally identifying information or details regarding the specific geographic location were removed from the sample posts to conceal participants’ identity.

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^cUsing one-way ANOVA total interactions differed significantly between the different post topics ($F=6.40$, $p<0.001$).

^cAfter using a Bonferroni correction to account for multiple post-hoc pairwise comparisons, the Personal Sharing posts generated significantly more interactions compared to Program Reminder posts ($p<0.01$), Healthy Eating posts ($p<0.001$), and Motivation posts ($p<0.01$). There were no other significant differences in number of interactions between types of posts.