Published in final edited form as:

Digit Health. 2016 November 01; 2: . doi:10.1177/2055207616654822.

Feasibility and acceptability of Facebook for health promotion among people with serious mental illness

John A Naslund^{1,2}, Kelly A Aschbrenner^{1,2,3}, Lisa A Marsch^{3,4}, Stephen J Bartels^{1,2,4,5}

¹Health Promotion Research Center at Dartmouth, USA

²The Dartmouth Institute for Health Policy and Clinical Practice, Dartmouth College, USA

³Department of Psychiatry, Geisel School of Medicine at Dartmouth, USA

⁴Center for Technology and Behavioral Health, Dartmouth College, USA

⁵Department of Community and Family Medicine, Geisel School of Medicine at Dartmouth, USA

Abstract

Objective—Elevated obesity rates are a major contributor to the significantly reduced life expectancy impacting people with serious mental illness. With over 1.5 billion Facebook users worldwide, this platform may afford opportunities for reaching individuals with serious mental illness outside professional settings and fostering social support for adopting healthier behaviors. In this mixed methods pilot study, we explored the feasibility and acceptability of using Facebook to support a group lifestyle intervention for weight loss among obese adults with serious mental illness.

Methods—Nine of eleven participants enrolled in a six-month lifestyle intervention delivered through a community mental health center agreed to join a private Facebook group to support their healthy eating and exercise goals. We measured participants' use of the Facebook group and collected post-intervention feasibility and acceptability questionnaires followed by in-depth qualitative interviews to elicit participants' perspectives and recommendations for improving the use of Facebook.

Creative Commons CC-BY-NC: This article is distributed under the terms of the Creative Commons Attribution-onCommercial 3.0 License (http://www.creativecommons.org/licenses/by-nc/3.0/) which permits non-commercial use, reproduction and distribution of the work without further permission provided the original work is attributed as specified on the SAGE and Open Access page (https://us.sagepub.com/en-us/nam/open-access-at-sage).

Corresponding author: John A Naslund, 46 Centerra Parkway, Lebanon, NH, United States, 03766. john.a.naslund@gmail.com; Twitter: @naslundj.

Contributorship: JAN and KAA designed the study. JAN delivered the Facebook Group. KAA supervised the project. JAN and KAA completed data collection and data analyses. JAN wrote the initial draft of the manuscript. KAA revised the manuscript. LAM and SJB reviewed and edited the manuscript. All authors approved the final version.

Declaration of Conflicting Interests: LAM 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 conflicting interests.

Ethical approval: Committees for the Protection of Human Subjects at Dartmouth College and the New Hampshire Department of Health and Human Services approved all study procedures.

Guarantor: JAN.

Peer review: This manuscript was reviewed by three reviewers. The author(s) have elected for these individuals to remain anonymous.

Results—Of 188 posts to the Facebook group, the majority (79%) were from participants compared to study staff (21%). Participants also posted 186 comments, 299 likes, and recorded 1316 page views. Participants were positive about opportunities to interact and support each other outside group sessions, found content posted by other participants to be helpful, and indicated that the Facebook group was safe to use. Participants provided constructive feedback, including recommendations for more detailed instructions for accessing the group and posting content, finding ways to encourage more interaction within the group, and tips for responding to notifications or alerts directly from the Facebook website.

Conclusions—These findings suggest that Facebook may be feasible for supporting health promotion efforts targeting people with serious mental illness. Participants provided valuable feedback that can inform the use of Facebook for future health promotion efforts targeting this high-risk group.

Keywords

Serious mental illness; Facebook; social media; health promotion; obesity; feasibility study; mental health; community mental health

Introduction

Obesity is nearly twice as prevalent among people with serious mental illness, including schizophrenia spectrum and mood disorders, compared to the general population. The combination of poor diet, sedentary lifestyle, metabolic effects of psychiatric medications, poverty, and elevated obesity rates have devastating consequences on the cardiovascular health of people with serious mental illness and contribute to the dramatically shortened life expectancy impacting this group. There are over 1.5 billion active Facebook users worldwide, and recent studies have found that even people with serious mental illness are increasingly using popular social media platforms. Therefore, the wide reach and popularity of Facebook may afford highly scalable and low-cost opportunities for engaging individuals with serious mental illness in lifestyle interventions aimed at addressing elevated rates of obesity and promoting positive lifestyle habits.

In the general population several studies have demonstrated the feasibility and acceptability of using Facebook for behavioral weight loss, ^{8,9} and the effectiveness of a Facebook group for promoting weight loss when used in combination with supportive text messaging. ¹⁰ A recent review also found that online social networking platforms including Facebook could effectively support interventions targeting modifiable health behaviors such as physical activity and diet. ¹¹ Among people with serious mental illness, recent review articles have demonstrated that online social networking platforms are feasible for reaching these individuals and delivering interventions targeting depression and mental health symptoms. ^{12–14} However, the feasibility and acceptability of using Facebook to support lifestyle interventions aimed at promoting healthy eating and exercise in this group has not been explored.

Recent randomized controlled trials have demonstrated that people with serious mental illness enrolled in behavioral weight loss programs can successfully achieve modest weight

loss. ^{15–18} However, research shows that among people with serious mental illness, many of the poor lifestyle habits such as unhealthy eating and sedentary behaviors are largely influenced by their social surroundings. ¹⁹ As Facebook becomes an important part of the social environments of many people with serious mental illness, it may serve as a platform for extending health promotion efforts beyond clinical or professional settings, and to reach these individuals in new ways.

For participants enrolled in group-based weight loss programs, research suggests that positive group dynamics can support successful weight loss.²⁰ Therefore, Facebook could also provide more opportunities for participants with serious mental illness who are already enrolled in a group-based lifestyle intervention to interact and to support each other outside of formal face-to-face sessions. Using Facebook to extend support and encouragement may be especially valuable for people with serious mental illness who face additional challenges to adopting healthier lifestyle behaviors, such as the impact of symptoms on motivation, effects of social isolation, or societal stigma associated with having a mental illness.¹

The objective of this pilot study was to explore the feasibility and acceptability of using Facebook to support a group-based lifestyle intervention targeting healthy eating and exercise among obese adults with serious mental illness. We employed a mixed methods design, 21,22 where participants completed post-intervention feasibility and acceptability questionnaires about their use of Facebook, followed by in-depth qualitative interviews to expand on their responses and to obtain detailed feedback to inform the future use of Facebook for targeting weight loss in this group.

Methods

Participants enrolled in a six-month group lifestyle intervention were invited to join a Facebook group created specifically for the program. From July to October 2014, we recruited a convenience sample of individuals with serious mental illness from a community mental health center to participate in a lifestyle intervention. Clinical staff at the mental health center recommended interested and eligible participants for enrollment in the program. Eligible participants were 21 years of age or older; had a serious mental illness defined by an axis I diagnosis of schizophrenia, schizoaffective disorder, major depressive disorder, or bipolar disorder (based on the Structured Clinical Interview for DSM-IV and confirmed by clinicians at the community mental health center)²³; and had obesity defined as body mass index 30 kg/m². Participants were also on stable pharmacological treatment defined as receiving the same psychiatric medications over the past two months. Participants were excluded if they were residing in a nursing home or other institution, had cognitive impairment defined as a Mini Mental Status Exam²⁴ score <24, had an active substance use disorder, or were unable to speak English. We provided participants with smartphones to access Facebook through a mobile application for the study duration. Participants completed baseline assessments as well as post-intervention assessments and interviews, and were compensated \$20 to cover their time for completing the assessments and \$20 for completing the interviews. Participants were not compensated for enrolling in the study, participating in the lifestyle intervention, or joining the Facebook group. Committees for the Protection of

Human Subjects at Dartmouth College and the New Hampshire Department of Health and Human Services approved all study procedures.

Lifestyle intervention

The lifestyle intervention was adapted from the evidence- based Diabetes Prevention Program and was delivered through an urban community mental health center in New Hampshire. 25 The modified program focused on achieving weight loss through healthy eating and exercise and consisted of 24 weekly sessions, twice weekly optional exercise classes led by a certified fitness trainer and tailored to the needs and abilities of sedentary adults, and mobile health technology support including a private Facebook group, text message reminders, and wearable devices for tracking steps. 25,25 The weekly sessions focused on weight loss through healthy eating and physical activity. The standard Diabetes Prevention Program curriculum consists of 16 weekly sessions, ²⁷ but this was expanded to six months (24 weekly sessions) to incorporate additional content aimed at addressing the impact of mental health symptoms on the ability to make positive health behavior changes. Research suggests that shorter lifestyle interventions may not be as effective as longer and more intensive interventions for supporting behavioral weight loss among high-risk groups of individuals with serious mental illness. ²⁸ Participants were taught standard weight-loss techniques such as goal setting, self-monitoring dietary intake and physical activity, and problem-solving to overcome challenges to engaging in exercise or preparing healthy meals on a fixed budget. Two graduate students with certification as lifestyle coaches for delivering the official Diabetes Prevention Program content taught the weekly sessions. The life-style coaches received weekly supervision from study staff for the duration of the project. A full description of the intervention is available elsewhere.²⁵

Facebook group

We created a private Facebook group for the program. Within the group, only participants whom we invited could post or share content such as text, photos, or videos, view posts, click 'like' to show that they enjoyed a post, or post comments visible only to other group members. We introduced the Facebook group and the ground rules for its use to participants in the sixth session of the 24-session lifestyle program. The lifestyle coaches and a member of the research staff provided a 30-minute briefing to participants for using the Facebook group. Participants used the private Facebook group for a total of 20 weeks (including one holiday week with no group session). Participants were instructed to only post content related to healthy eating and exercise, that was supportive and encouraging, and that described successes or challenges towards achieving healthy lifestyle goals. Participants were asked not to post personally identifying information such as 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. We explained that the Facebook group was intended to reinforce content from the weekly group sessions and to allow participants to interact and share personal successes and challenges with meeting weight loss and physical activity goals outside regular meetings. Study staff also posted content related to topics covered in the group sessions, reminders to exercise, and tips for healthy eating.

Privacy

For participants who were new to Facebook, we helped them set up an account, and provided instruction regarding safety precautions for sharing and posting personal information online. A member of the study staff met with these participants for about 30 minutes to review the different features of Facebook. We recommended using their first name only or a pseudonym when creating an account so that participants could remain anonymous within Facebook, yet we encouraged them to disclose their identity to other participants once they posted messages within the group. For participants who were already active on Facebook, we encouraged them to either use their personal account, or to create a second account just to use for the study. By using the private group feature on Facebook we maintained administrative control over the group, and could ensure that only participants enrolled in the study could view, access, and share content. If necessary we could also delete posts or comments, or remove participants from the group. A member of our research team monitored content daily for the study duration to ensure that posts were appropriate and relevant to the objectives of the health promotion intervention. Ongoing technical support for using Facebook was provided to participants as needed.

Quantitative and qualitative data collection and analysis

We employed a mixed methods design.^{21,22} First, after the six-month lifestyle intervention, participants completed a 14-item feasibility and acceptability questionnaire adapted from a prior study of a mobile health intervention for people with psychotic disorders.^{29,30} This quantitative measure generated important insight about participants' evaluation of the feasibility, acceptability, and satisfaction with using Facebook. However, a quantitative rating scale is insufficient for understanding participants' specific experiences using Facebook or for identifying ways to improve its use.

Therefore, in the second step, we conducted semi-structured qualitative interviews with participants to expand on the breadth and scope of their questionnaire responses. ²¹ Interviews were 45–60 minutes in duration, and explored perceived benefits, challenges, and usefulness of the Facebook group, as well as recommendations for improvement. Expansion is an effective technique for combining quantitative and qualitative data to obtain a more comprehensive evaluation, ³¹ and is valuable for refining and making revisions to intervention design. ³²

The interviews were audio-recorded and transcribed for analysis, which involved categorization and classification of data to systematically identify key topics and to draw inferences. 33,34 Two researchers (JAN and KAA) independently reviewed the interview transcripts to immerse themselves in the data. Then, one researcher (JAN) summarized participants' comments about the Facebook group collected from the qualitative interviews, and organized them into categories. A second researcher (KAA) reviewed the categories and summary of the comments to ensure that they were representative of the data. Disagreements were discussed until consensus was reached. Both researchers then organized the comments into two broad themes: (1) comments and feedback about what participants liked about the Facebook group; and (2) comments about what participants disliked and recommendations

for improvement. This content analytic approach was selected because our objective was to summarize key recommendations for informing future use of Facebook.

Results

Participant characteristics

In total, 29 people were referred for the current study by clinical staff at the community mental health center. Eight of these individuals were not interested and eight did not meet the study inclusion criteria or experienced medical concerns that precluded participation. Two individuals who agreed to participate quit at the start of the program due to other time commitments. Therefore, 11 individuals initiated the lifestyle intervention and were invited to join the Facebook group. Over half (55%) of these participants reported owning a smartphone, though only one participant chose to use his personal smartphone for the study.

Demographic and clinical characteristics of the 11 participants are listed in Table 1. Most participants invited to join Facebook were women (73%), all were non-Hispanic white, and the mean age was 48.2–11.2 years (range 21 to 57 years) and mean BMI was 41.5–11.5 kg/m². Participants' mental illness diagnoses included schizophrenia spectrum disorders (27%), major depressive disorder (45%), and bipolar disorder (27%). Two of the 11 participants were concerned about privacy, and were not interested in joining the Facebook group. One participant explained, "I was leery about [Facebook] because I don't like a lot of my personal business just out there . . . It's a thing I don't particularly care for," while the other participant indicated that, "I don't believe in Facebook . . . because I don't like my private stuff online."

The remaining nine participants joined the Facebook group. Three participants were new to Facebook and created personal accounts specifically for this study. Because Facebook was new to them, they felt more comfortable using pseudonyms for creating accounts to avoid any privacy concerns. Six participants were active Facebook users, and used their personal accounts.

Participants' use of the Facebook group

During the study period, there were a total of 188 posts to the Facebook group, the majority (79%) of which were posted by participants. The remaining posts (21%) were from study staff. Participants were highly active in the Facebook group as reflected by 186 comments, 299 likes, and 1316 page views. Throughout the study duration, participants did not post any inappropriate content within the group, and no comments or posts were deleted, and no participants were removed from the group.

Feasibility and acceptability of the Facebook group

Only participants who joined the Facebook group (n=9) completed post-intervention feasibility and acceptability questionnaires. Table 2 summarizes participants' questionnaire responses. Most agreed that the Facebook group was easy to use and could be easily accessed through the smartphone application, but there was some disagreement reflected in the satisfaction ratings among participants regarding the usefulness of the group, how fun

the group was to use, and the benefits of the group for encouraging physical activity and choosing healthier food options. Importantly, the majority of participants found that the Facebook group was safe to use, and that they would recommend it to a friend and were interested in continuing to use it.

Participant feedback about the Facebook group

All 11 participants completed the in-depth qualitative interviews (see Table 3). The interviews revealed that participants viewed the content posted by other participants to be interesting and helpful, in particular content related to nutrition tips, recipes, and healthy foods. Participants also indicated that they appreciated the opportunity to interact with others, and being able to give and receive support for achieving successes and for overcoming challenges in trying to lose weight through healthy eating and exercise.

Participants also indicated in the interviews that there was not enough interaction on the Facebook group. One participant felt that the group did not come together on Facebook as expected with daily interactions between participants, while another participant who frequently posted content was interested in receiving more feedback from other participants in the form of 'likes' or comments. Because Facebook was new to several participants, there were recommendations for more detailed instructions and demonstrations on how to access and post content.

Lastly, some participants mentioned features of the Facebook website that were a nuisance. Some participants received unwanted requests to become "friends" with other participants on their personal accounts, or were prompted to become "friends" with people who were complete strangers, likely because of similar characteristics or overlapping Facebook "friend" networks. For some participants Facebook sent them automated prompts or advertisements to join online games, or sent them frequent email or text message updates. These frequent notifications were a distraction, and as a result one participant stopped using the Facebook group after three months.

Discussion

In this exploratory mixed methods pilot study, qualitative interviews expanded on participants' quantitative ratings about feasibility, acceptability, and satisfaction with using Facebook to support a group-based lifestyle intervention. In-depth interviews revealed that participants were generally positive about the opportunities to interact with others and to support each other on Facebook, and found the content posted by other participants to be helpful. Consistent with prior research from the general population, ¹¹ our findings highlight the potential feasibility and many promising aspects of using a popular online social networking website such as Facebook to support a group-based lifestyle intervention for individuals with serious mental illness. However, our findings must be interpreted with caution and future research is needed to determine how social media can be used to promote engagement in lifestyle interventions among people with serious mental illness and whether such efforts contribute to clinically important outcomes such as reduction in cardiovascular risk.

Participants also commented on many aspects of the Facebook group that they did not like, and provided helpful suggestions for improving the way that we introduce Facebook, provide instructions for accessing the group, and encourage participants to use it. Based on participants' feedback, we identified three important considerations for informing the use of Facebook in future health promotion efforts. First, more extensive technical training for accessing, posting content, and interacting on the Facebook group is needed when introducing the group to participants. This is especially important for participants who are new to Facebook or have limited experience with online technologies. This is consistent with prior studies describing the introduction of new mobile health technologies in this population, where more detailed instruction may be necessary given limited prior exposure and cognitive deficits associated with having a serious mental illness. ^{36,37} There is also a need for more individualized assistance and one-on- one training for setting up an account and accessing the Facebook group.

Second, efforts are needed to foster more group cohesion and to help participants feel comfortable interacting with one another on the Facebook group. Participants indicated that they wanted to see more interaction between each other, but did not want staff to get involved in posting more content. One possible approach for promoting group cohesion may be to recruit peer volunteers to assist with moderating and posting content to the Facebook group. Peer volunteers could be individuals with serious mental illness who were previously enrolled in a group intervention and who demonstrated frequent use of the Facebook group and an interest in supporting others who are working towards similar healthy lifestyle goals. Evidence in the general population suggests that even if participants are passively viewing content on Facebook without interacting, they may still experience benefits such as social support for weight loss behaviors. ³⁸ This supports the need to ensure that peer volunteers regularly post relevant and interesting content to the group.

Third, future efforts should attempt to ensure that participants are fully aware of many of the features of the Facebook website. As part of the instruction and introduction to Facebook, it is necessary to explain to participants that unwanted friend requests, prompts, notifications, and advertisements are all part of using popular social media like Facebook. Additional recommendations should be provided for how best to respond to or ignore alerts and notifications, as well as greater emphasis on ways to maintain and protect privacy, and to avoid unwanted requests from strangers.

Limitations

Several limitations with this study should be considered. Most notably, the small sample size and lack of racial or ethnic diversity may limit generalizability of these findings across other geographic regions or community mental health settings. Additionally, we recruited a convenience sample of individuals who were interested and willing to participate in a lifestyle intervention and who were receiving treatment through a community mental health center. Therefore these findings may not be representative of individuals with serious mental illness not currently receiving treatment. Given that this was a preliminary feasibility study, a member of the study staff assisted participants with setting up personal Facebook accounts and provided additional instruction for using the private Facebook group. In a real world

implementation of this program it would be ideal for the lifestyle coach to facilitate the Facebook component of the intervention, in addition to leading the weekly group sessions. Among participants who agreed to join the Facebook group, none mentioned any safety concerns related to using the group, and the majority reported that the group was safe to use, though future research should specifically explore participants' evaluation of safety and privacy in the context of using Facebook as a part of lifestyle interventions. Recent research suggests that people with serious mental illness use social media and Facebook at comparable rates as the general population, ^{39,40} further highlighting the potential for these popular online platforms to substantially expand the reach of health promotion efforts. Despite this promise, it is important to recognize that popular social media such as Facebook will likely not be ideal for reaching all individuals with serious mental illness, and that future research is necessary to explore how to most effectively leverage this high-risk group's use of these popular websites to support meaningful and lasting health behavior change.

Conclusions

To our knowledge, this is the first exploration of the feasibility and acceptability of using Facebook for health promotion among people with serious mental illness. Despite the notable limitations described above, the design of our study was unique because our Facebook group was largely participant-driven, as opposed to daily messages posted by research staff. Participants indicated that they enjoyed interacting on the Facebook group, which may be because they had a chance to get to know each other in the face-to-face group intervention sessions prior to joining the Facebook group. This approach may overcome previously identified challenges with engaging users on social media, where users may not be comfortable interacting with strangers. ⁴¹ Prior studies have also suggested that social media may be effective for promoting participant engagement in behavioral weight loss interventions, rather than directly contributing to weight loss. ⁴²

The findings from our exploratory pilot study suggest that Facebook may be both feasible and acceptable for supporting a group lifestyle intervention for people with serious mental illness. Additionally, our findings emphasize the importance of obtaining and integrating feedback from participants early on when testing novel online technologies for health promotion. Through participant feedback, we learned important details about specific features of the Facebook website, and what participants value when interacting on this type of platform. These insights are critical for informing the design and use of Facebook in future health promotion efforts targeting this high-risk group because research suggests that the way participants interact within a Facebook group for behavioral weight loss can influence outcomes. 43 Future research should seek to identify the types of individuals who would be most likely to benefit from intervention content delivered through Facebook in order to reach a wider range of people with serious mental illness with targeted health promotion efforts. Popular social media like Facebook may be promising for supporting behavioral weight-loss efforts among people with serious mental illness, yet future research is needed to carefully weigh the potential risks and benefits of using Facebook in this way, and to assess whether this platform effectively supports positive group dynamics and contributes to meaningful weight loss and physical activity outcomes.

Acknowledgments

Funding: The author(s) disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: This work was supported by the National Institute of Mental Health (grant number R01 MH089811-01) and the United States Centers for Disease Control and Prevention Health Promotion and Disease Prevention Research Center (grant number Cooperative Agreement Number U48DP005018). The funders had no role in study design, data collection and analysis, decision to publish, or preparation of the manuscript.

References

- Allison DB, Newcomer JW, Dunn AL, et al. Obesity among those with mental disorders: A National Institute of Mental Health meeting report. Am J Prev Med. 2009; 36:341–350. [PubMed: 19285199]
- Walker ER, McGee RE, Druss BG. Mortality in mental disorders and global disease burden implications: A systematic review and meta-analysis. JAMA Psychiatry. 2015; 72:334

 –341. [PubMed: 25671328]
- 3. Facebook. [accessed 25 March 2016] Stats. 2016. http://newsroom.fb.com/company-info/
- 4. Miller BJ, Stewart A, Schrimsher J, et al. How connected are people with schizophrenia? Cell phone, computer, email, and social media use. Psychiatry Res. 2015; 225:458–463. [PubMed: 25563669]
- 5. Naslund JA, Aschbrenner KA, Marsch LA, et al. The future of mental health care: Peer-to-peer support and social media. Epidemiol Psychiatr Sci. 2016; 25:113–122. [PubMed: 26744309]
- Highton-Williamson E, Priebe S, Giacco D. Online social networking in people with psychosis: A systematic review. Int J Soc Psychiatry. 2015; 61:92–101. [PubMed: 25381145]
- 7. Naslund JA, Grande SW, Aschbrenner KA, et al. Naturally occurring peer support through social media: The experiences of individuals with severe mental illness using YouTube. PLOS One. 2014; 9(10):e110171. [PubMed: 25333470]
- Merchant G, Weibel N, Patrick K, et al. Click "like" to change your behavior: A mixed methods study of college students' exposure to and engagement with Facebook content designed for weight loss. J Med Internet Res. 2014; 16:e158. [PubMed: 24964294]
- 9. Cavallo DN, Tate DF, Ries AV, et al. A social media–based physical activity intervention: A randomized controlled trial. Am J Prev Med. 2012; 43:527–532. [PubMed: 23079176]
- Napolitano MA, Hayes S, Bennett GG, Ives AK, Foster GD. Using Facebook and text messaging to deliver a weight loss program to college students. Obesity. 2013; 21:25–31. [PubMed: 23505165]
- 11. Maher CA, Lewis LK, Ferrar K, et al. Are health behavior change interventions that use online social networks effective? A systematic review. J Med Internet Res. 2014; 16:e40. [PubMed: 24550083]
- 12. Alvarez-Jimenez M, Alcazar-Corcoles M, Gonzalez-Blanch C, et al. Online, social media and mobile technologies for psychosis treatment: A systematic review on novel user-led interventions. Schizophr Res. 2014; 156:96–106. [PubMed: 24746468]
- Naslund JA, Aschbrenner KA, Marsch LA, et al. Crowdsourcing for conducting randomized trials
 of Internet delivered interventions in people with serious mental illness: A systematic review.
 Contemp Clin Trials. 2015; 44:77–88. [PubMed: 26188164]
- Naslund JA, Marsch LA, McHugo GJ, et al. Emerging mHealth and eHealth interventions for serious mental illness: A review of the literature. J Ment Health. 2015; 24:321–332. [PubMed: 26017625]
- 15. Daumit GL, Dickerson FB, Wang N-Y, et al. A behavioral weight-loss intervention in persons with serious mental illness. New Engl J Med. 2013; 368:1594–1602. [PubMed: 23517118]
- Bartels SJ, Pratt SI, Aschbrenner KA, et al. Pragmatic replication trial of health promotion coaching for obesity in serious mental illness and maintenance of outcomes. Am J Psychiat. 2015; 172:344–352. [PubMed: 25827032]
- 17. Bartels SJ, Pratt SI, Aschbrenner KA, et al. Clinically significant improved fitness and weight loss among over-weight persons with serious mental illness. Psychiatr Serv. 2013; 64:729–736. [PubMed: 23677386]

 Green CA, Yarborough BJH, Leo MC, et al. The STRIDE weight loss and lifestyle intervention for individals taking antipsychotic medications: A randomized trial. Am J Psychiat. 2015; 172:71–81.
 [PubMed: 25219423]

- 19. Aschbrenner KA, Carpenter-Song E, Mueser K, et al. A qualitative study of social facilitators and barriers to health behavior change among persons with serious mental illness. Community Ment Health J. 2013; 49:207–212. [PubMed: 23054155]
- 20. Nackers LM, Dubyak PJ, Lu X, et al. Group dynamics are associated with weight loss in the behavioral treatment of obesity. Obesity. 2015; 23:1563–1569. [PubMed: 26179461]
- 21. Creswell, JW. Research design: Qualitative, quantitative, and mixed methods approaches. 4. Thousand Oaks, CA: SAGE Publications; 2013.
- 22. Curry LA, Krumholz HM, O'Cathain A, et al. Mixed methods in biomedical and health services research. Circ Cardiovasc Qual Outcomes. 2013; 6:119–123. [PubMed: 23322807]
- 23. First, MB, Spitzer, RL, Gibbon, M., et al. Structured Clinical Interview for DSM-IV Axis I Disorders. New York, NY: New York State Psychiatric Institute, Biometric Research Department; 1995. Patient Edition (SCID-P), version 2
- Folstein MF, Folstein SE, McHugh PR. Mini-mental state: A practical method for grading the cognitive state of patients for the clinician. J Psychiatr Res. 1975; 12:189–198. [PubMed: 1202204]
- 25. Aschbrenner KA, Naslund JA, Shevenell M, et al. Feasibility of behavioral weight loss treatment enhanced with peer support and mobile health technology for individuals with serious mental illness. Psychiat Quart. 2015:1–15. [PubMed: 25270895]
- Naslund JA, Aschbrenner KA, Bartels SJ. Wearable devices and smartphones for activity tracking among people with serious mental illness. Ment Health Phys Act. 2016; 10:10–17. [PubMed: 27134654]
- Kramer MK, Kriska AM, Venditti EM, et al. Translating the Diabetes Prevention Program: A comprehensive model for prevention training and program delivery. Am J Prev Med. 2009; 37:505–511. [PubMed: 19944916]
- Cabassa LJ, Ezell JM, Lewis-Fernández R. Lifestyle interventions for adults with serious mental illness: A systematic literature review. Psychiatr Serv. 2010; 61:774

 –782. [PubMed: 20675835]
- Ben-Zeev D, Kaiser SM, Krzos I. Remote "hovering" with individuals with psychotic disorders and substance use: Feasibility, engagement, and therapeutic alliance with a text-messaging mobile interventionist. J Dual Diagn. 2014; 10:197–203. [PubMed: 25391277]
- 30. Aschbrenner KA, Naslund JA, Gill LE, et al. A qualitative study of client-clinician text exchanges in a mobile health intervention for individuals with psychotic disorders and substance use. J Dual Diagn. 2016; 12:63–71. [PubMed: 26829356]
- 31. Greene JC, Caracelli VJ, Graham WF. Toward a conceptual framework for mixed-method evaluation designs. Educ Eval Policy Anal. 1989; 11:255–274.
- Collins KM, Onwuegbuzie AJ, Sutton IL. A model incorporating the rationale and purpose for conducting mixed methods research in special education and beyond. Learn Disabil. 2006; 4:67– 100
- 33. Curry LA, Nembhard IM, Bradley EH. Qualitative and mixed methods provide unique contributions to outcomes research. Circulation. 2009; 119:1442–1452. [PubMed: 19289649]
- Holsti, OR. Content analysis for the social sciences and humanities. Reading, MA: Addison-Wesley; 1969.
- 35. Hsieh H-F, Shannon SE. Three approaches to qualitative content analysis. Qual Health Res. 2005; 15:1277–1288. [PubMed: 16204405]
- 36. Ben-Zeev D, Brenner CJ, Begale M, et al. Feasibility, acceptability, and preliminary efficacy of a smartphone intervention for schizophrenia. Schizophrenia Bull. 2014; 40:1244–1253.
- 37. Naslund JA, Aschbrenner KA, Barre LK, et al. Feasibility of popular m-Health technologies for activity tracking among individuals with serious mental illness. Telemed J E Health. 2015; 21:213–216. [PubMed: 25536190]
- 38. Ballantine PW, Stephenson RJ. Help me, I'm fat! Social support in online weight loss networks. J Consum Behav. 2011; 10:332–337.

39. Naslund JA, Aschbrenner KA, Bartels SJ. How people living with serious mental illness use smartphones, mobile apps, and social media. Psychiatr Rehabil J. 2016; 9:e110171.

- 40. Birnbaum ML, Rizvi AF, Correll CU, et al. Role of social media and the Internet in pathways to care for adolescents and young adults with psychotic disorders and non-psychotic mood disorders. Early Interv Psychiatry. 2015; doi: 10.1111/eip.12237
- 41. Eysenbach G, Powell J, Englesakis M, et al. Health related virtual communities and electronic support groups: Systematic review of the effects of online peer to peer interactions. BMJ. 2004; 328:1166. [PubMed: 15142921]
- 42. Chang T, Chopra V, Zhang C, Woolford SJ. The role of social media in online weight management: Systematic review. J Med Internet Res. 2013; 15:e262. [PubMed: 24287455]
- 43. Hales SB, Davidson C, Turner-McGrievy GM. Varying social media post types differentially impacts engagement in a behavioral weight loss intervention. Behav Med Pract Policy Res. 2014; 4:355–362.

Naslund et al. Page 13

 Table 1

 Participants' baseline demographic and clinical characteristics.

Characteristic	n	Percentage
Total sample	11	100%
Demographic characteristics		
Mean age, years (m ± SD)	48.2 ± 11.2	
Female	8	73%
Non-Hispanic white	11	100%
Education		
Completed high school	5	46%
Some college	3	27%
College degree	3	27%
Living situation		
Living independently	8	73%
Living with family	3	27%
Marital status		
Never married	3	27%
Currently married	1	9%
Previously married	7	64%
Currently employed (part or full-time)	3	27%
Enrolled in Medicaid	9	82%
Dual eligible (enrolled in Medicaid and Medicare)	8	73%
Clinical characteristics		
Mental illness diagnosis		
Schizophrenia spectrum disorders	3	27%
Major depressive disorder	5	46%
Bipolar disorder	3	27%
BMI (kg/m^2) $(m \pm SD)$	41.5 ± 11.5	
Weight (lbs) (m ± SD)	243.5 ± 53.2	

Author Manuscript

Author Manuscript

Table 2

Summary of participant responses to the quantitative feasibility and acceptability questionnaire for using the private Facebook group.

	Number of participants who responded (n)	ants who re	sponded (n)				
Survey item	Strongly disagree	Disagree	Disagree somewhat	Neutral	Agree somewhat	Agree	Strongly agree
Feasibility							
The secret Facebook group is easy to use	1	1	0	0	1	33	3
I can easily see content on the secret Facebook group	1	0	1	0	0	4	3
I can easily post comments or content onto the Facebook group	0	1	0	1	2	2	3
I can easily access the Facebook group using the iPhone	0	0	0	1	1	5	2
I learned to use the Facebook group quickly	1	1	0	0	2	2	3
Satisfaction							
The Facebook group is useful	1	2	0	0	0	2	4
The Facebook group helps me connect with other participants	0	1	0	1	2	2	3
The Facebook group is fun to use	0	3	0	0	0	2	4
The Facebook group helps me be more active	0	3	0	0	2	_	3
The Facebook group helps me choose healthier food options	0	3	0	0	0	2	4
I am satisfied with the Facebook group	1	0	0	2	2	1	3
I found the Facebook group safe to use	0	1	0	1	0	3	4
I would recommend the Facebook group to a friend	0	2	0	0	0	3	4
I would like to continue using the Facebook group	1	1	0	0	1	2	4

 Table 3

 Participant quotes from the qualitative interviews about using the private Facebook group.

Themes and categories	Sample quotes from participants	
Theme 1: What participants liked about the Facebook group		
Helpful information and tips posted by other participants	" I like what I read, what I saw, how it was helpful to me. Like things about diet, nutritional information, I liked that." "It's actually been a couple of interesting recipes on there, that others have posted too, [participant name] has been posting a lot of good stuff and I tried a couple of recipes on there and in general just keeps it in my mind more going in the group and seeing the posts." "Getting tips from the other participants on recipes that they put up online that they found were helpful to them. I would try it too, and everything worked out pretty good." "Getting recipes and different foods that are low-fat. I actually put a few myself."	
Learning from other participants' experiences of success or struggles	" sharing of information and learning new things and new ways of coping, and seeing how others are similarly struggling sometimes or have achieved success; all of those things." "Even people who are struggling or who are doing well to be able to post on there and get a pat on the back from others and comments."	
Giving support and receiving support from other participants	"It continues that connection of the peer support. The other is the helpfulness of some just posting 'I had a crappy day today' then someone else posting back saying, 'You can do it' or 'you've gotten through these things before." "One person posted on Facebook that she couldn't get all her steps in. She didn't know what to do, she spent all this time walking. I suggested why not increase the intensity a little bit of your walk? Walk a little faster and see if you can get the extra steps in that way, and she liked that." "And seeing what they put up on Facebook. We would encourage them if they needed the extra help or something, I would participate on giving advice and they would say thanks."	
Theme 2: What participants disl	iked about the Facebook Group and recommendations for improvement	
Need for more group cohesion and group interaction in the Facebook group	" it just didn't really feel like the group pulled together. [] I think it should've been a daily like group thing all of us working together to support each other and share new ideas or new goals. Just really keep it group oriented" "People don't seem to for whatever reason not everybody interacts on there as much. There might be a few comments here and there. Most people kind of just lurk maybe they're shy about posting [] I wish people were more involved in it, I don't mean staff but participants I wish they would open up a little more to get more into it." " sometimes you don't know when you post something if it's really helpful or not, if people liked it or not, if they don't click like [] Do you like what you see because I'm not getting feedback on what I'm posting?"	
Recommendations for more instruction and guidelines for accessing and posting in the Facebook group	"I think teaching how to use Facebook, number one, and how to use it" "Maybe add fun health quizzes related to the program, maybe a little more creativity." "I don't know if people know how to click right in just to see the group's posts. I think it would be more beneficial if people did that and were encouraged to click in and take their time and look at the Facebook group itself and the post." "Probably when you're getting ready to introduce the Facebook group, encourage others to try it and see if they can get tips from what we've learned. I'd probably suggest that."	
Facebook software automatically sends unwanted requests	"'You may know this person.' I thought it was just our [program] circle but it tries to connect you. [] I don't want to be notified that so and so might know so and so. I wanted it to be for the [program] people only and I thought we were only going to just say hi to each other or 'hope to see you there."' "There was an issue that came up. Some of us play games I'm on Facebook anyway regardless. I was sending somebody requests but the machine It's automated and it was causing some upset and I had to explain that I wasn't sending them requests."	