HHS Public Access

Author manuscript

Psychiatr Rehabil J. Author manuscript; available in PMC 2017 December 01.

Published in final edited form as:

Psychiatr Rehabil J. 2016 December ; 39(4): 328–334. doi:10.1037/prj0000219.

A Mixed Methods Study of Peer-to-Peer Support in a Group-based Lifestyle Lifestyle Intervention for Adults with Serious Mental Illness

Kelly A. Aschbrenner, PhD[a,b,c], **John A. Naslund, MPH**[a,b], and **Stephen J. Bartels, MD, MS**[a,b,c,d]

[a]Health Promotion Research Center at Dartmouth, Lebanon, NH, United States

[b]The Dartmouth Institute for Health Policy and Clinical Practice, Dartmouth College, Lebanon, NH, United States

[c]Department of Psychiatry, Geisel School of Medicine at Dartmouth, Lebanon, NH, United States

[d]Department of Community and Family Medicine, Geisel School of Medicine at Dartmouth, Lebanon, NH, United States

Abstract

Objective—There is potential for peer support to enhance healthy lifestyle interventions targeting changes in body weight and fitness for adults with serious mental illness. The purpose of this study was to explore peer-to-peer support among individuals participating in a group lifestyle intervention that included social media to enhance in person weight management sessions.

Methods—A mixed methods study design was used to explore participants' perceptions and experiences of support from other group members during a six-month group lifestyle intervention. Twenty-five individuals with serious mental illness reported their perceptions of the peer group environment and social support during the overall intervention. Seventeen of these individuals also participated in focus group interviews further exploring their experiences with group members.

Results—More than 80% of participants agreed that other group members were trustworthy and dependable, and 92% reported a high level of shared purpose and active participation in the group. Participants described how shared learning and group problem-solving activities fostered friendships and provided essential support for health behavior change. Sharing information, personal successes and challenges, and "being in the same boat" as other group members were key features of peer-to-peer support.

Conclusions and Implications for Practice—Findings from this exploratory study suggest that participants enrolled in a group-based lifestyle intervention for people with serious mental illness experience peer-to-peer support in various ways that promote health behavior change.

Correspondence: Correspondence concerning this article should be addressed to Kelly A. Aschbrenner at 46 Centerra Parkway, Lebanon, NH, 03766 kelly.aschbrenner@dartmouth.edu.

Conflict of Interest: None for any author.

Financial Disclosure: No financial disclosures were reported by any of the authors of this manuscript.

These findings highlight opportunities to enhance future lifestyle interventions with collaborative learning and social network technologies that foster peer support among participants.

Introduction

Over 80% of people with serious mental illness are overweight or obese (Correll et al., 2010), which contributes to a 10 year reduced life expectancy in this population (Druss, Zhao, Von Esenwein, Morrato, & Marcus, 2011). While weight gain is a side effect of antipsychotic treatment, lifestyle factors account for much of the risk of obesity and cardiovascular disease in this population (De Hert et al., 2011). Lifestyle interventions targeting changes in weight and fitness among adults with serious mental illness have demonstrated effectiveness in achieving clinically significant cardiovascular risk reduction in as many as half of participants (Bartels et al., 2013; Bartels et al., 2015; Daumit et al., 2013; Green et al., 2015). However, this first generation of lifestyle interventions for individuals with serious mental illness have relied heavily on didactic sessions taught by health coaches or educators with minimal attention to promoting positive peer-to-peer interactions that could facilitate the adoption of healthy behaviors. Developing new intervention strategies that empower participants to give each other frequent, ongoing, and flexible support for health behavior change has the potential to enhance lifestyle interventions for individuals with serious mental illness.

Peer-to-peer support, consisting of non-hierarchical mutually beneficial relationships with similar others who face the same health problem has been leveraged in group-based lifestyle interventions evaluated in the general population (Leahey, Kumar, Weinberg, & Wing, 2012; Leahey & Wing, 2013). Participants enrolled in behavioral weight loss treatment have reported that social support, accountability, and information sharing with other participants were the most helpful components of group-based treatment (Befort, Donnelly, Sullivan, Ellerbeck, & Perri, 2010). In the field of mental health, peer specialists have been trained as providers to deliver medical self-management programs (Druss et al., 2010; Kelly et al., 2014) and to provide health and wellness education through highly structured didactic programs (SAMHSA, 2015). However, there has been less attention given to the creation of non-hierarchical peer-to-peer support networks comprised of people with serious mental illness who share the same health goals to lose weight and improve fitness. Fostering social connections among individuals who can share information and experiences, and provide one another with emotional support for health behavior change represents a new paradigm for reducing cardiovascular risk in persons with serious mental illness.

Our research team has conducted an iterative series of pilot studies evaluating the feasibility, acceptability, and potential benefits of a lifestyle intervention designed to foster peer-to-peer support for health behavior change among adults with serious mental illness (citation, 2015a, 2015b, 2015c). We found preliminary evidence demonstrating that an intervention led by lifestyle coaches who facilitated group learning and social interaction through face-to-face sessions and online social networking was associated with weight loss and improved fitness among obese adults with serious mental illness, with 45% of participants achieving weight loss and 45% improving fitness by increasing their walking distance over the six-month study period (citation, 2015a). The present study compliments and extends this prior line of

research by exploring in-depth participants' perceptions and experiences with peer interactions during the lifestyle intervention. Gaining a deeper understanding of peer-to-peer support as a potential mechanism of behavior change will enable future lifestyle intervention strategies to fully maximize this natural resource.

Method

Participants who provided the data used in the present mixed methods study were enrolled in a pre-post pilot study of a 24-week group-based lifestyle intervention for adults with serious mental illness. The intervention study was conducted in collaboration with an urban community mental health center in southern New Hampshire. Participants were age 21 or older; had a chart diagnosis of schizophrenia, schizoaffective disorder, major depressive disorder, or bipolar disorder; on stable pharmacological treatment defined as receiving the same psychiatric medications over the prior 2 months; and had obesity defined as body mass index (BMI) ≥ 30. Excluded persons had medical contraindication to weight loss; pregnant or planning to become pregnant within the next 6 months; prior or planned bariatric surgery; or current diagnosis of an active alcohol-use or substance-use disorder. Participants received medical clearance from a primary care provider to participate in the exercise component of the program.

Participants had a mean age of 48.6 years (SD = 11.4). The sample was 56% female, and 100% were white. Participants' psychiatric diagnoses were as followed: 40% major depression, 36% bipolar disorder, and 24% schizophrenia spectrum disorders. Eighty-eight percent had completed a high school education or GED, with 40% of these participants having completed college or technical coursework and 20% having completed a college degree. Fifty-two percent were separated or divorced, 36% never married, and 12% were married. The vast majority of participants (80%) were living independently, 16% were living with family, and 4% were residing in assisted living facilities. Participants had a mean body mass index of 38.2 kg/m^2 (SD = 8.5), with 36% of participants meeting the criteria for Class III obesity (BMI ≥ 40), which is considered morbidly obese.

Participants in the intervention study were paid $20 for completing baseline and post-intervention assessments and an additional $20 for participating in a one-time focus group interview following their participation in the intervention. The present study combined quantitative post-intervention survey data from 25 participants who completed the study with qualitative focus group interview data from 17 of these participants. We did not observe any statistically significant baseline differences in weight, BMI, fitness, or psychiatric diagnosis between participants who participated in the focus group interviews and those who did not. Nor did we observe statistically significant differences in pre-post changes in weight, BMI, or fitness between these two groups. Written informed consent to participate in the quantitative pre-post assessments was given upon initial recruitment into the study. Participants provided verbal informed consent at the time the post-intervention focus group interviews were conducted. The research was approved by the Committees for the Protection of Human Subjects at Dartmouth College and the New Hampshire Department of Health and Human Services.

Intervention

The 24-week group-based lifestyle intervention in which participants were enrolled consisted of: (a) once weekly one-hour group weight management sessions facilitated by two lifestyle coaches; (b) twice weekly (optional) one-hour group exercise sessions led by a certified fitness trainer; and (c) mobile technology and use of social media to increase motivation and facilitate self-monitoring and peer-to-peer support outside of in-person group treatment or exercise sessions. During weekly group weight management sessions, two lifestyle coaches (a psychologist and a public health professional) taught principles of healthy eating and exercise using an experiential and collaborative learning process that, in contrast to didactic lectures, was facilitated through group discussion, team building activities, and hands-on participation in group problem solving activities tied to real world challenges with health behavior change. Learning experiences were structured to empower participants to take initiative, make decisions, and to be accountable to the group for results. Participants worked together to develop plans to apply new information about healthy eating and exercise in their daily lives. Session activities were designed to facilitate a supportive network for weight loss and physical activity. The twice-weekly one-hour group exercise sessions were optional for participants and consisted of stretching, resistance training, and cardio exercises tailored to the needs of obese sedentary adults. These sessions were led by a certified fitness trainer and were held a location within the community. One of the lifestyle coaches also regularly attended the group exercise sessions.

The mobile technology component included the use of social media to allow participants to virtually connect and support each other as peers towards achieving healthy lifestyle goals outside of weekly group weight management and exercise sessions. Participants were provided smartphones to access a “private” Facebook group in which only study participants were able to join and share content. Participants could join the “private” Facebook group that supported online peer networking and where they could interact and share personal successes and challenges with meeting weight loss and physical activity goals. The private Facebook group was introduced to participants during the Week 6 of the 24-week program so that participants would have had ample time and opportunity to meet in person first, and get to know each other and feel comfortable interacting online. The lifestyle coaches introduced the private Facebook group to participants as part of the group session content in Week 6, and instructed participants 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. Study staff regularly posted content related to topics covered in the group sessions, reminders to exercise, and tips for healthy eating, but online staff interaction with participants was kept to a minimum to maximize peer driven social networking. The lifestyle coaches and the certified fitness trainer were also members of the private Facebook group, and periodically posted helpful reminders about the weekly group exercise classes or commented on participants’ posts by providing encouragement or helpful feedback. Study staff monitored the Facebook group 3 times each week to ensure that content posted by participants was appropriate and related to the program objectives.

Quantitative and Qualitative Data Collection

We used a parallel convergent mixed methods design in which qualitative and quantitative data are collected at the same time, analyzed separately, and then merged to reach a comprehensive understanding of the research topic (Creswell & Clark, 2007). Quantitative surveys used in a prior study of behavioral weight loss treatment were used to measure perceived group dynamics in this study (Nackers et al., 2015). First, participants reported their perceptions of the group environment using the Group Climate Questionnaire-Short Form (GCQ-S) (MacKenzie, 1983). The GCQ-S contains 12 items rated on a scale that ranges from 1 (Not at all) to 7 (Extremely) with three dimensions of scores: Engagement, Avoidance, and Conflict. The five-item Engagement scale measures group cohesion and positivity, the three-item Avoidance scale reflects group reluctance to change, and the four-item Conflict scale assesses interpersonal friction within the group. Higher scores on each domain suggest greater levels of that group process. In the present study, we report results of the three GCQ subscale scores. We converted data collected on a 7-point scale to a 5-point scale for ease of presenting the frequencies for each item by combing the last three response options ("*Quite a bit, A great deal, and Extremely*") since each of these response options represents strong positive endorsements of an item. The means and standard deviations reported in the results are based on the 7-point scale. An analysis of internal consistency within the present sample demonstrated acceptable reliability for the global score (Cronbach's $\alpha = 0.57$).

To assess perceived social support from other group members, participants completed an adapted version of the 10-item Social Provisions Scale-Short Form (SPS-10), which assesses five domains of social relationships (guidance, reliable alliance, reassurance of worth, attachment, and social integration) (Caron, 2013; Cutrona & Russell, 1987). For this study, only the global SPS-10 score was used. Participants were instructed to respond to each of 10 statements (1=Agree to 4=Strongly Agree) as it pertained to relationships with other group members. Example items include: "There are people in the group I can depend on to help me if I really needed it" and "I have close relationships with group members that provides me with a sense of emotional security and well-being." An analysis of internal consistency within the present sample demonstrated high reliability (Cronbach's $\alpha = .91$).

Qualitative focus group interviews were used to complement and expand the quantitative survey data. The primary author (KA) conducted the focus group interviews with support from a research assistant. A flexible format with a prepared discussion guide was used to encourage dialogue among respondents. The facilitator asked participants to share their experiences interacting with other group members (both positive and negative) during the lifestyle invention, without focusing specifically on participants' experiences of peer support during any one component of the intervention (i.e., group weight management sessions, weekly group exercise sessions, or private Facebook group). Rather, the goal was to elicit participants' perceptions of peer-to-peer support throughout the overall intervention. The focus group facilitator used follow-up questions and specific probes to clarify responses and explore answers in more depth as needed. The one-hour focus group interviews were audiorecorded and transcribed verbatim for data analysis.

Analytic Approach

We present quantitative data from the questionnaires at both the item level and by using descriptive statistics to summarize the data (means and standard deviations). Close examination of item level data can yield information with greater specificity for understanding participants' perceptions of peer group support. Statistical analyses were performed using SPSS software, version 22.0. We analyzed transcripts using thematic analysis, a method for identifying, analyzing, and reporting patterns within qualitative data (Braun & Clarke, 2006). We focused on identifying broad themes closely aligned with the construct of peer-to-peer support for health behavior change. The primary author (KA) developed a preliminary list of codes based on the qualitative transcripts. The second author (JN) coded the data using the preliminary code list as a guide, while editing and adding codes. The researchers categorized the codes (i.e., subthemes) into broader themes and selected representative quotes from the data for each theme. Any disagreements were resolved through clarification and discussion. The final product was a list of themes, subthemes, and representative quotes. For the mixed methods analysis, the qualitative data was used to provide additional depth and insights regarding the quantitative findings.

Results

Quantitative Results

With respect to the Group Climate Questionnaire (GCQ), the Engagement subscale score assessing group cohesion and positivity were moderate ($M = 3.28$ $SD = .82$), the Avoidance subscale scores reflecting group reluctance to change were also moderate ($M = 3.57$ $SD = 1.3$), and the Conflict subscale scores assessing interpersonal friction within the group were low ($M = 0.44$ $SD = .72$). Frequencies of item-level responses on the GCQ are reported in Table 1. A close examination of the frequency of responses reveals that participants' perceptions of several aspects of group engagement were moderate-to-high. Ninety-two percent of participants reported a high level of shared purpose and active participation in the group, and eighty percent of participants reported moderate-to-high levels of care and concern among group members. Reports of any type of group conflict were low. Sixty-eight percent of participants reported moderate or high levels of group members behaving in ways they thought would be acceptable to the group. Of note, 56% of participants endorsed the idea that other members avoided looking at important issues going on between themselves either moderately or a lot.

The global score for the Social Provisions Scale-Short Form (SPS-10) assessing perceived social support from the group was high ($M = 30.8$ $SD = 5.5$). The item-level responses to the SPS-10 are presented on Table 2. Participants' perceptions of peer-to-peer support were rated high in most areas. Over 80% of participants perceived other group members as trustworthy and dependable, and the majority of participants (71%) felt they had developed close relationships with other group members. Eighty-three percent felt they were part of a group of people who shared their attitudes and beliefs. Interestingly, 83% felt there were people in the group who they could count on in emergencies. Of note, we did not observe any statistically significant differences in perceived social support from other group

members (SPS-10) or perceptions of the group environment (GCQ) between participants who completed the focus group interviews and those who did not.

Qualitative Results

Focus group interviews were used to provide additional insight into participants' experiences interacting with other group members during the intervention. Participants were asked to share their experiences (both positive and negative) during face-to-face sessions and online social networking activities. Five broad themes emerged from the data analysis: (1) "being in the same boat," (2) social relationships, (3) group learning, (4) social support, and (5) challenges in social situations. The themes, subthemes, and representative quotes are presented in Table 3. "Being in the same boat" was described by participants as sharing health goals and making healthy changes at the same time as other group members. The second theme, social relationships, arose from participants' accounts of how the program fostered friendships and companionship with other group members. Group learning was a theme that emerged from participants' descriptions of problem solving activities and teamwork, and being motivated by other participants to make healthy changes. The theme social support encompassed participants' experiences sharing information, personal successes and challenges, and giving and receiving advice among group members. As illustrated in the quotes presented in Table 3, participants gave examples of how social support occurred during both face-to-face and online interactions with other group members. Finally, the theme challenges in social situations arose from participants' self-described anxiety about participating in small groups and difficulty with social interactions. Of note, several participants who described challenges with social situations also described feeling pleased once they joined the group activities.

Convergence of Quantitative and Qualitative Data

The qualitative data generated broad themes related to participants' experiences in the peer group intervention, whereas the item-level quantitative data provided an opportunity to observe participant ratings of specific aspects of the group environment and perceived social support from group members. The GCQ subscale ratings on engagement, conflict, and avoidance indicated an overall positive group environment, which is consistent with the qualitative themes related to group learning (e.g., problem solving, teamwork, and external motivation). Similarly, the SPS-10 global score indicated a high level of perceived social support from group members. The qualitative focus group interviews revealed types of social support experienced by group members that were consistent with items endorsed by a majority of participants on the SPS-10. For example, 83% of participants agreed with the SPS-10 item: "There is a trustworthy person I could turn to for advice if I were having problems," and participants reported during qualitative interviews that giving and receiving advice was a benefit of the peer group intervention.

The mixed methods convergence analysis also provided insight into negative ratings of peer group support. Interestingly, 29.2% of participants disagreed with the statement" "I have close relationships [in the group] that provide me with a sense of emotional security and well-being." Furthermore, twenty-five percent of participants disagreed with the statement: "There is someone I could talk to about important decisions in my life." One theme that

emerged in the focus group interviews were the challenges some group members experienced with interacting in small groups and with other participants in the program. This qualitative theme expands findings from the quantitative assessments of peer group support by suggesting that low ratings on perceived closeness to other group members may a reflection of the challenges some participants experience in social situations.

Discussion

To our knowledge, our mixed methods study is the first to explore in-depth the perceptions and experiences of peer-to-peer support among obese individuals with serious mental illness participating in a group lifestyle intervention. Survey data revealed that, overall, participants perceived other group members as trustworthy and dependable, and the majority of participants reported a high level of shared purpose and active participation in the group. The qualitative data yielded additional insights about how peer group interactions supported health behavior change. Participants reported that hands-on learning and problem-solving activities fostered friendships and peer support for health behavior change. Online social networking was used to enhance the group-based intervention by allowing participants to share information, personal successes and challenges, and to encourage and support one another outside of treatment sessions. Participants described “being in the same boat” as other group members as an important benefit of the lifestyle intervention. The qualitative reports also highlighted challenges with social interactions, including anxiety about participating in small groups that will need to be considered in future interventions that aim to create new social connections to promote health in this population.

Group-based lifestyle interventions have been promoted as a strategy for increasing the scalability and widespread dissemination of behavioral weight management treatment targeting obesity in the general population (Venditti & Kramer, 2013), and there is an emerging evidence-base supporting the effectiveness of group lifestyle interventions for individuals with serious mental illness (Daumit et al., 2013; Green et al., 2015). However, little research to date has explored in depth participant dynamics that contribute to health behavior change. Participants in the present study described the “bonds” and “friendships” they formed with peers in the group and how these relationships motivated them to make healthier choices. Several participants shared that although they initially felt uncomfortable interacting with new people and participating in small group activities, they enjoyed the companionship and social interactions with other group members. These findings shed new light on the role that participants in a professionally led group-based lifestyle intervention can play in supporting one another in the health behavior change process. Using strategies to leverage these positive group dynamics could potentially enhance the effectiveness of group-based lifestyle interventions targeting obesity in people with serious mental illness.

One method for facilitating peer-to-peer support in a lifestyle intervention is the use of participatory instructional techniques. Collaborative learning activities that stimulate personal, active engagement in program material through the development of teamwork skills were used in the intervention described in the present study to teach key principles of healthy eating and physical activity. When compared to more traditional didactic methods where participants passively receive information from an instructor, collaborative learning

has been shown to improve participant engagement and retention of educational concepts and materials (Prince, 2004). Participants in the present study were engaged in a participatory and active peer learning process involving team building activities, games, and problem solving exercises. Didactic instruction was kept to a minimum so that participants had optimal time to form group cohesion, empathy, and goal collaboration. For example, in "Lets Get Moving!" team learning stations used group card sorting games that challenged participants to sort different types of exercises by level of perceived effort to stimulate thinking about how to meet weekly physical activity goals. In an empowering session ("Know Your Neighborhood"), participants left the classroom on a 10-minute walk during which they use their study smartphones to take pictures of barriers and facilitators to exercise and present their photos to the group for discussion. Including collaborative learning activities in future lifestyle interventions adapted for people with serious mental illness has the potential to facilitate peer-to-peer support among group members and create a community of wellness to promote health behavior change.

Limitations

There are several limitations of this study that warrant consideration. First, the sample involves volunteers who completed a lifestyle intervention study at a community mental health center. The perspectives and experiences of these participants may be different from those who did not complete the intervention. Future attempts should be made to include the perspectives of individuals who drop out of group-based lifestyle programs. Second, the focus group interview data included mostly favorable reports of participants' experiences with other group members. It is possible that some participants did not feel comfortable sharing negative experiences in a group interview setting with their peers following the intervention. Conducting individual qualitative interviews in a future study could give participants an opportunity to share any negative experiences with peer-to-peer support. Third, the focus group interviews were not designed to elicit participants' specific views on how peer support from the group weight management sessions compared to peer support from the group exercise classes or the private Facebook group. Future qualitative interviews could be conducted with participants in multi-component interventions to explore experiences and perceived differences in the type, amount, and quality of peer-to-peer support received in each component. Another study limitation is the questionable internal consistency of the Group Climate Questionnaire. Future psychometric testing in a larger sample will need to be conducted to determine whether the scale has utility in future studies of peer support in group-based lifestyle interventions for individuals with serious mental illness. Finally, consistent with an exploratory qualitative study, the observed results illustrate common themes, but determining the effectiveness of this approach in improving outcomes will require a larger study.

Conclusions

People with serious mental illness experience high rates of obesity associated with cardiometabolic disorders and a reduced life expectancy compared to the general population. Peer-to-peer support, which consists of non-hierarchical mutually beneficial relationships with similar others, has the potential to enhance lifestyle interventions for people with

serious mental illness. Findings from this exploratory study suggest that participants enrolled in a group-based lifestyle intervention for people with serious mental illness experience peer-to-peer support in various ways that promote health behavior change. These findings highlight opportunities to enhance future lifestyle interventions with collaborative learning activities and social network technologies that foster peer support among participants.

Acknowledgments

The research reported in this article was supported by grants from the United States Centers for Disease Control and Prevention (CDC U48DP001935-0), the National Institute of Mental Health (R01MH089811), and the Agency for Healthcare Research and Quality (K12 HS021695-01).

References

Bartels SJ, Pratt SI, Aschbrenner KA, Barre LK, Jue K, Wolfe RS, … Mueser KT. Clinically significant improved fitness and weight loss among overweight persons with serious mental illness. Psychiatr Serv. 2013; 64(8):729–736. DOI: 10.1176/appi.ps.003622012 [PubMed: 23677386]

Bartels SJ, Pratt SI, Aschbrenner KA, Barre LK, Naslund JA, Wolfe R, … Bird BL. Pragmatic replication trial of health promotion coaching for obesity in serious mental illness and maintenance of outcomes. Am J Psychiatry. 2015; 172(4):344–352. DOI: 10.1176/appi.ajp.2014.14030357 [PubMed: 25827032]

Befort CA, Donnelly JE, Sullivan DK, Ellerbeck EF, Perri MG. Group versus individual phone-based obesity treatment for rural women. Eat Behav. 2010; 11(1):11–17. DOI: 10.1016/j.eatbeh.2009.08.002 [PubMed: 19962115]

Braun V, Clarke V. Using thematic analysis in psychology. Qualitative Research in Psychology. 2006; 3(2):77–101. DOI: 10.1191/1478088706qp063oa

Caron J. A validation of the Social Provisions Scale: the SPS-10 items. Sante Ment Que. 2013; 38(1): 297–318.

citation A. Feasibility of Behavioral Weight Loss Treatment Enhanced with Peer Support and Mobile Health Technology for Individuals with Serious Mental Illness. Psychiatr Q. 2015a; doi: 10.1007/s11126-015-9395-x

citation A. Feasibility of popular m-health technologies for activity tracking among individuals with serious mental illness. Telemed J E Health. 2015b; 21(3):213–216. DOI: 10.1089/tmj.2014.0105 [PubMed: 25536190]

citation A. Peer health coaching for overweight and obese individuals with serious mental illness: intervention development and initial feasibility study. Transl Behav Med. 2015c; :1–8. DOI: 10.1007/s13142-015-0313-4 [PubMed: 25729448]

Correll CU, Druss BG, Lombardo I, O'Gorman C, Harnett JP, Sanders KN, … Cuffel BJ. Findings of a U.S. National Cardiometabolic Screening Program Among 10,084 Psychiatric Outpatients. Psychiatric Services. 2010; 61(9):892–898. DOI: 10.1176/ps.2010.61.9.892 [PubMed: 20810587]

Creswell JW, Clark VLP. Designing and conducting mixed methods research. 2007

Cutrona CE, Russell DW. The provisions of social relationships and adaptation to stress. Advances in personal relationships. 1987; 1(1):37–67.

Daumit GL, Dickerson FB, Wang NY, Dalcin A, Jerome GJ, Anderson CA, … Appel LJ. A behavioral weight-loss intervention in persons with serious mental illness. N Engl J Med. 2013; 368(17): 1594–1602. DOI: 10.1056/NEJMoa1214530 [PubMed: 23517118]

De Hert M, Correll CU, Bobes J, Cetkovich-Bakmas M, Cohen DAN, Asai I, … Leucht S. Physical illness in patients with severe mental disorders. I. Prevalence, impact of medications and disparities in health care. World Psychiatry. 2011; 10(1):52–77. [PubMed: 21379357]

Druss BG, Zhao L, Von Esenwein S, Morrato EH, Marcus SC. Understanding excess mortality in persons with mental illness: 17-year follow up of a nationally representative US survey. Med Care. 2011; 49(6):599–604. DOI: 10.1097/MLR.0b013e31820bf86e [PubMed: 21577183]

Druss BG, Zhao L, von Esenwein SA, Bona JR, Fricks L, Jenkins-Tucker S, … Lorig K. The Health and Recovery Peer (HARP) Program: a peer-led intervention to improve medical self-management for persons with serious mental illness. Schizophr Res. 2010; 118(1–3):264–270. DOI: 10.1016/j.schres.2010.01.026 [PubMed: 20185272]

Green CA, Yarborough BJ, Leo MC, Yarborough MT, Stumbo SP, Janoff SL, … Stevens VJ. The STRIDE weight loss and lifestyle intervention for individuals taking antipsychotic medications: a randomized trial. Am J Psychiatry. 2015; 172(1):71–81. DOI: 10.1176/appi.ajp.2014.14020173 [PubMed: 25219423]

Kelly E, Fulginiti A, Pahwa R, Tallen L, Duan L, Brekke JS. A pilot test of a peer navigator intervention for improving the health of individuals with serious mental illness. Community Ment Health J. 2014; 50(4):435–446. DOI: 10.1007/s10597-013-9616-4 [PubMed: 23744292]

Leahey TM, Kumar R, Weinberg BM, Wing RR. Teammates and social influence affect weight loss outcomes in a team-based weight loss competition. Obesity (Silver Spring). 2012; 20(7):1413–1418. DOI: 10.1038/oby.2012.18 [PubMed: 22310234]

Leahey TM, Wing RR. A randomized controlled pilot study testing three types of health coaches for obesity treatment: Professional, peer, and mentor. Obesity (Silver Spring). 2013; 21(5):928–934. DOI: 10.1002/oby.20271 DOI: 10.1038/oby.2012.179 [PubMed: 23784896]

MacKenzie, KR. The clinical application of a group climate measure. In: Dies, RR.; Mackenzie, KR., editors. Advances in group psychotherapy: Integrating research and practice. New York: International Universities Press; 1983. p. 159-170.

Martire LM, Franks MM. The role of social networks in adult health: Introduction to the special issue. Health Psychology. 2014; 33(6):501. [PubMed: 24884903]

Nackers LM, Dubyak PJ, Lu X, Anton SD, Dutton GR, Perri MG. Group dynamics are associated with weight loss in the behavioral treatment of obesity. Obesity (Silver Spring). 2015; 23(8):1563–1569. DOI: 10.1002/oby.21148 [PubMed: 26179461]

Naslund JA, Aschbrenner KA, Marsch LA, Bartels SJ. The future of mental health care: peer-to-peer support and social media. Epidemiol Psychiatr Sci. 2016; :1–10. DOI: 10.1017/s2045796015001067

Prince M. Does active learning work? A review of the research. JOURNAL OF ENGINEERING EDUCATION-WASHINGTON-. 2004; 93:223–232.

SAMHSA. Whole Health Action Management (WHAM) Peer Support Training Participant Guide. SAMHSA-HRSA Center for Integrated Health Solutions; 2015. Retrieved from http://www.integration.samhsa.gov

Venditti EM, Kramer MK. Diabetes Prevention Program Community Outreach Perspectives on Lifestyle Training and Translation. American Journal of Preventive Medicine. 2013; 44(4 Suppl 4):S339–S345. DOI: 10.1016/j.amepre.2012.12.014 [PubMed: 23498296]

Table 1

Participants' perceptions of the peer group environment using the Group Climate Questionnaire-Short Form (n = 25)

Statement	Number of Participants Selecting Each Response				
	Not At All	A Little Bit	Somewhat	Moderately	A Lot
Engaged Subscale					
Members liked and cared about each other.	0	2 (8%)	3 (12%)	3 (12%)	17 (68%)
Members tried to understand why they do the things they do, tried to reason it out.	0	0	4 (16%)	3 (12%)	18 (72%)
Members felt what was happening was important and there was a sense of participation.	0	0	1 (4%)	1 (4%)	23 (92%)
Members challenged and confronted each other in their efforts to sort things out. *	5 (20%)	8 (32%)	4 (16%)	3 (12%)	4 (16%)
Members revealed sensitive personal information or feelings.	8 (32%)	2 (8%)	9 (36%)	3 (12%)	3 (12%)
Conflict Subscale					
There was friction and anger between the members.	23 (92%)	1 (4%)	0	1 (4%)	0
Members were distant and withdrawn from each other.	18 (72%)	3 (12%)	1 (4%)	3 (12%)	0
Members rejected and distrusted each other.	21 (84%)	2 (8%)	1 (4%)	0	1 (4%)
Members appeared tense and anxious.	17 (68%)	3 (12%)	3 (12%)	1 (4%)	1 (4%)
Avoidance Subscale					
Members avoided looking at important issues going on between themselves.	6 (24%)	2 (8%)	3 (12%)	2 (8%)	12 (48%)
Members depended upon the group leader(s) for direction.	0	1 (4%)	1 (4%)	2 (8%)	21 (84%)
Members appeared to do things the way they thought would be acceptable to the group.	2 (8%)	1 (4%)	5 (20%)	4 (16%)	13 (52%)

Note. One participant refused to answer this item.

Psychiatr Rehabil J. Author manuscript; available in PMC 2017 December 01.

Table 2

Participants' perceptions of peer social support using the Social Provisions Scale (n = 24)

Statement	Number of Participants Selecting Each Response			
	Strongly Disagree	Disagree	Agree	Strongly Agree
There are people I can depend on to help me if I really need it.	0	2 (8.3%)	14 (58.3%)	8 (33.3%)
There are people who enjoy the same social activities I do.	1 (4.2%)	6 (25.0%)	10 (41.7%)	7 (29.2%)
I feel part of a group of people who share my attitudes and beliefs.	0	4 (16.7%)	13 (54.2%)	7 (29.2%)
I have close relationships that provide me with a sense of emotional security and well-being.	0	7 (29.2%)	10 (41.7%)	7 (29.2%)
There is someone I could talk to about important decisions in my life.	0	6 (25.0%)	9 (37.5%)	9 (37.5%)
I have relationships where my competence and skills are recognized.	0	6 (25.0%)	13 (54.2%)	5 (20.8%)
There is a trustworthy person I could turn to for advice if I were having problems.	0	4 (16.7%)	9 (37.5%)	11 (45.8%)
I feel a strong emotional bond with at least one other person.	0	7 (29.2%)	9 (37.5%)	8 (33.3%)
There are people who admire my talents and abilities.	0	7 (29.2%)	12 (50.0%)	5 (20.8%)
There are people I can count on in an emergency.	0	4 (16.7%)	12 (50.0%)	8 (33.3%)

Table 3

Emergent themes and sub-themes of peer interactions from qualitative data

Theme and sub-theme	Representative quotes from participants
"Being in the same boat" • Sharing health goals • Making changes at the same time	"You're not doing it alone, you're doing it in a group and it gives you more of a chance to not quit when the going gets tough…other group members will encourage you to keep going." "Because they are in the same boat they know exactly what you mean and how you feel." "I've lost a lot of weight, made a lot of nice friends, and they share interests, want to lose weight, get fit, work out, and eat healthier. I don't think I could have done it by myself."
Social relationships • Building friendships • Companionship • Having fun together	"I developed friendships with a lot of group members and that meant a lot to me." "Just knowing that every week you're going to come to the group, and there's always going to be something fun and interesting to talk about, that was something I really looked forward to." "I enjoyed the companionship. I live alone and I am alone a lot of the time, so I enjoyed coming to group and seeing everybody."
Group learning • Problem solving • Teamwork • Motivated by others	"The activities were fun. We didn't just sit and listen for an hour. We were actively engaged in the classroom…I enjoyed it and the people and found the classes informative." "You share things with each other and you learn and grow as a person. Making friendships, having a bond, solving problems with each other, and working as a team. That was a lot of fun!" "There's 5 of us going through the struggle at the same time, I can see how they're doing, and they're learning the things at the same time I am, so I can ask them what they're doing different."
Social support • Sharing information • Sharing personal successes and challenges • Giving and receiving advice	"Hearing how other people struggle with the same thing and how they've overcome it, or how they haven't been able to. They're here to get more ideas on how to make changes." "A lot of information on the Facebook group. A lot of members were posting things, it was a lot of great information that helped." "It was nice having the PeerFIT Facebook so I could talk to people. If I missed a group I could say like "oh hey, what happened?" I could find out about the ones that wanted to share about their paths, because that was something that motivated them, you know, and to me that was interesting."
Challenges in social situations • Anxiety participating in small groups • Difficulty interacting with new people	"Breaking up into small groups kind of stressed me out, and I felt like I didn't want to do it, but I was relieved I did it afterwards." "I know the importance of the program is to be together, but at the beginning you don't know these people, some of us have problems interacting with people we don't know."