

Development and Evaluation of Innovative Peer-Led Physical Activity Programs for Mental Health Service Users

Candida R. Graham, MBChB, MRCPsych, FRCPC,*† Roseann Larstone, PhD,*
Brenda Griffiths, MD, FRCPC,† Sarah de Leeuw, PhD,*‡ Lesley Anderson, BSc,*
Stephanie Powell-Hellyer, MSc,* and Nansi Long, CMHW§

Abstract: Mental health service users (MHSUs) have elevated rates of cardio-metabolic disturbance. Improvements occur with physical activity (PA) programs. We report the development and evaluation of three innovative peer-developed and peer-led PA programs: 1) walking; 2) fitness; and 3) yoga. Qualitative evaluation with 33 MHSUs in British Columbia, Canada, occurred. These programs yielded improvements for participants, highlighted by powerful narratives of health improvement, and improved social connections. The feasibility and acceptability of innovative peer-developed and peer-led programs were shown. Analyses revealed concepts related to engagement and change. Relating core categories, we theorize effective engagement of MHSUs requires accessibility on three levels (geographic, cost, and program flexibility) and health behavior change occurs within co-constituent relationships (to self, to peers, and to the wider community). This study highlights the benefits of peer involvement in developing and implementing PA programs and provides a theoretical framework of understanding engagement and behavior change in health programs for MHSUs.

Key Words: Physical activity programs, mental health service users, peer leadership, program evaluation

(*J Nerv Ment Dis* 2017;205: 840–847)

Rates of physical ill health in individuals experiencing severe mental illness (SMI), defined as chronic mental illness requiring ongoing management, are significantly higher than in the general population (Brown, 1997; Saha et al., 2007). Individuals who experience SMI will by the nature of their illness access mental health services and are therefore also known as mental health service users (MHSUs). MHSUs have markedly elevated rates of cardiometabolic disturbance including obesity, diabetes, dyslipidemia, and cardiovascular disease (Brown, 1997; Olfson et al., 2015; Saha et al., 2007) resulting in a disproportionate burden of ill health for this population and significant demand on health care budgets and resources (Filik et al., 2006). As of 2014, it was estimated that nearly 422 million people worldwide had diabetes (World Health Organization, 2016) and that the prevalence of type 2 diabetes in individuals with schizophrenia is two to four times higher than that in the general population (Holt et al., 2005; Mezuk et al., 2008). Depressive illness has also been reported to be associated with a 60% increased lifetime risk of developing type 2 diabetes (McIntyre et al., 2006). Similarly, obesity levels are markedly higher in people with mood disorders (McIntyre et al., 2006) and schizophrenia (McCreadie,

2003; Saarni et al., 2009) than individuals in the general population. Taken together, individuals with schizophrenia or bipolar disorder have a 20% and 25% shorter life expectancy than individuals without such diagnoses (Laursen, 2011) and die at least 10 years earlier than age-matched individuals from nonsuicidal causes (Thornicroft, 2011). The evidence suggests poor health behaviors, low engagement with health services, smoking, lack of exercise, poor nutrition, and medication adverse effects primarily account for increased rates of cardiometabolic disease and premature mortality in this population (Nolte and Martin, 2008; Robson and Gray, 2007).

Researchers and clinicians advocate adoption of a healthy lifestyle by this population, consisting of good dietary and physical exercise habits. Studies evaluating programs of physical activity (PA), wellness training, and targeted behavioral interventions have shown significant health improvements and impact on cardiometabolic risk reduction for MHSUs (Bartels et al., 2013, 2015; Daumit et al., 2013; Green et al., 2015). However, attrition from such programs for MHSUs is reported to be higher by some studies (Brown and Chan, 2006).

Difficulties of engagement and retention have been explored (Graham et al., 2014; Ussher et al., 2007). Researchers have identified symptoms caused by illness, treatment adverse effects, stigma, receiving little support, and difficulties changing habits all act as significant barriers to healthier lifestyle choices for MHSUs. Stigma on three levels have been identified as significant barriers for MHSUs to living healthily (Graham et al., 2013): structural (wherein policies of social institutions restrict involvement of stigmatized groups of people), social (a lack of understanding expressed toward members of the stigmatized group by influential or dominant social groups), and self-stigma (wherein negative societal attitudes are internalized as a part of the person's own self-image) (Corrigan et al., 2011).

Conversely, service providers believe clients experience positive support in adopting healthier lifestyle behaviors when clients take personal initiative, have peer support, and have easy access to community resources (McKibbin et al., 2014; Browne et al., 2016; Naslund et al., 2016). Similarly, MHSUs have identified factors of empowerment, self-value and personal growth, social context and support, motivation and planning, and access as being important to engagement in healthy behaviors (Graham et al., 2014; Vazin et al., 2016). These barriers and conversely lack of facilitators may account for lower rates of positive outcomes in service provider-delivered healthy lifestyle interventions (Barre et al., 2011; Graham et al., 2013; Soundy et al., 2007).

Peer-led interventions are increasingly used to promote health behavior change and enhance recovery in diverse settings for a range of physical and mental health conditions in both the general population and in adults with severe mental illness (Dickerson et al., 2016; Druss et al., 2010; Gimis et al., 2013; Simoni et al., 2011). The value of incorporating peer support models in mental health recovery is well-established (Ashton et al., 2013; Jain et al., 2016; Miyamoto and Sono, 2012; Weibel et al., 2010). By sharing lived experiences of health concerns and providing social support and role modeling (Gray et al., 2013; Solomon, 2004), peer leadership builds rapport and trust between participants. At a more

*Northern Medical Program, University of Northern British Columbia, Prince George; †Faculty of Medicine, and ‡School of Population and Public Health, University of British Columbia, Vancouver; and §Activity Centre for Empowerment, BC Schizophrenia Society, Prince George Branch, Prince George, British Columbia, Canada.

Send reprint requests to Candida R. Graham, MBChB, MRCPsych, FRCPC, Northern Medical Program, University of Northern British Columbia, 3333 University Way, Prince George, British Columbia, Canada V2N 4Z9.

E-mail: candida.graham@unbc.ca.

Copyright © 2017 Wolters Kluwer Health, Inc. All rights reserved.

ISSN: 0022-3018/17/20511-0840

DOI: 10.1097/NMD.0000000000000746

fundamental level, the development of empathic human relationships has been shown to be an impactful aspect of peer support in mental health contexts (Armstrong et al., 1995).

Specific to MHSUs, research shows the value and effectiveness of peer-facilitation in producing positive behavioral change in a number of areas including smoking cessation (Ashton et al., 2013; Dickerson et al., 2016; Ford et al., 2013) and self-management of chronic disease (Druss et al., 2010). Peer-led health interventions are therefore a promising model for increasing the effectiveness and reach of health behavior programs and are a largely untapped avenue for health promotion in MHSU populations (Chinman et al., 2014; Ginis et al., 2013).

We undertook previous collaborative, community-based research exploring issues of healthy living for MHSU including understanding the meaning of and difficulties to healthy living as well as exploring projects participants wanted to develop (Graham et al., 2013, 2014). This work was collaboratively undertaken with an established MHSU community based at a psychosocial rehabilitation center. Analysis was informed by grounded theory and iteratively fed back to the community to ensure the concepts developed accurately reflected participants' experiences and perspectives. This gave voice to MHSUs' experiences and supported participant empowerment to drive change with MHSUs, identifying that they wanted to develop health improvement programs for their community. We found the strongest participant-generated endorsement, and the need expressed by the community was for PA programs (Graham et al., 2014). Hence, we moved forward with the community to help develop PA programs better meeting MHSUs' needs.

Although research has reported on PA programs developed and implemented by service providers, to our knowledge, none have reported on peer-developed, peer-led programs. Aschbrenner et al. (2016) reported the feasibility and effectiveness of a 24-week provider developed, peer-supported health promotion intervention designed to produce weight loss for adults with severe mental illness in 25 individuals. The authors observed a "link between making health behavior changes necessary for weight loss and perceived peer support" and identified that this link was not fully understood; they advocated for future qualitative research to explore the impact of peer support on health behavior change among MHSUs. The same authors identify positive partner support providing encouragement, practical support, and exercising together as supporting outcomes such as readiness to engage in PA and weight loss (Aschbrenner et al., 2017).

The purpose of this study was to evaluate using qualitative methods peer-developed and peer-led PA programs tailored for MHSUs. We were able to explore the feasibility and acceptability of such innovative programs in supporting MHSUs' health behavior change. The study design also allows an in-depth exploration of how improved health behavior occurs for MHSUs. By doing so the current research provides an understanding of how relationships support health outcomes.

The study was undertaken in a city in northern British Columbia, Canada, population 80,000. Participant recruitment was facilitated by an ongoing partnership between the authors and a psychosocial rehabilitation center (*i.e.*, the Activity Centre for Empowerment [ACE]), managed by the BC Schizophrenia Society. The center provides services for approximately 70 clients daily with approximately 300 clients in total enrolled. Criteria for access to its programs include being older than 19 years of age, living with persistent mental illness, and accessing specialist services.

Philosophical Position and Methodology

This research is guided by an understanding of behavioral change as described by self-determination theory (SDT; Deci and Ryan, 2000). SDT is a well-validated approach used in health care contexts to support individuals in making change toward healthier

decisions based on specific health outcomes (*e.g.*, smoking cessation) (Ryan et al., 2008). The evidence from SDT-informed studies suggests that working with individuals to support empowerment (*e.g.*, increased understanding, control and influence over personal and social circumstances) and autonomy (*i.e.*, freedom to determine one's own actions) produces sustained positive health behavioral changes (Ryan et al., 2008). This was independently reflected by the MHSU community who identified the desire for peer-led programs to build on community-based strengths, foster engagement, empowerment, and use expertise within the community (Graham et al., 2014).

Although SDT is used to support individuals in behavior change, community-based participatory research (CBPR) is a research method and lens used to identify social, structural, and environmental inequities and engage in community action (Israel et al., 1998, 2005). Many of the principles of SDT and CPBR are congruent, and the two approaches informed our work, allowing engagement and behavioral change to be considered on both an individual and community level (to be reported in a future manuscript).

METHODS

In conducting an evaluation of peer-developed, peer-led PA programs, we were interested in MHSUs' perspectives, concept analysis, and theory generation; therefore, a qualitative methodology was chosen. Because there was no preexisting hypothesis to test, and we hoped theory would emerge from systematically collected data, grounded theory offered the most appropriate methodology (Corbin and Strauss, 2015).

Procedure

Recruitment was conducted by presenting the project to center users and by providing recruitment literature. Interested individuals were directed to inform the center coordinator. Researchers undertook purposeful sampling to identify participants who met the study inclusion criteria of 1) living with severe mental illness, 2) being older than the age of 19 years, 3) experiencing a stable mental state at the time of the study, 4) receiving community specialist services, and 5) being able to give informed consent. There were no exclusion criteria so as to be consistent with the principles of community engagement work.

Ethics approval for the study was obtained from the relevant research ethics committees. Before participation, each individual provided informed written consent. Participants were compensated \$50 for their time in each focus group (*i.e.*, at midpoint and endpoint evaluations).

In our previous collaborative, community-based research participants identified four categories of initiative they wished to develop and engage with to help them improve their health: a) PA, b) nutrition, c) creativity, and d) illness support. The most frequently referenced category was PA. Within this rubric, walking was the most frequently mentioned followed by swimming and low impact exercise such as yoga and Pilates (Graham et al., 2014). In re-presenting these ideas to the study group, swimming was perceived as a lower priority with walking, a yoga program, and low impact exercise classes being the programs the MHSU group wanted to develop and implement.

In developing the programs with the participants, we were informed by the facilitators previously identified by the MHSU community, including: 1) feeling empowered and able to contribute; 2) having a social context and support in undertaking the activity; 3) identifying reasons for change and setting pragmatic goals; 4) having easy access to activities (Graham et al., 2014). We also addressed the previously identified barriers that we could realistically minimize as part of the project: 1) social and self-stigma; and 2) medication effects (causing morning tiredness) (Graham et al., 2013). The programs were developed collaboratively and iteratively in line

with CPBR principles, and SDT principles were incorporated into the programs.

Program Description

The collaboratively developed programs were as follows:

- A peer-led walking program held at two community sports centers. One sport center was further from the psychosocial rehabilitation center but had a state-of-the-art suspended walking/running track. The other center had a walking circuit and was close to the psychosocial rehabilitation center. The walking program had both beginner- and advanced-level groups, which would walk indoors or outdoors depending on preference and weather. The beginner group walked twice weekly for an average of 45 minutes each session over the 12-month study period. The advanced group walked twice weekly for an hour and 15 minutes.
- A yoga program developed with a local well-respected yoga studio. Class structures were informed by the needs of the MHSUs and led by a qualified instructor. Peer leads helped organize the class scheduling and the practice setting at the ACE center. This program involved a structured 7-week, twice-weekly program.
- A lower impact fitness program developed with the YMCA that was informed by the needs of the MHSUs. The class ran at the ACE. Peer leads organized scheduling and the space for the classes. This program involved once-weekly classes of 60 to 90 minutes' duration each. Each class followed a structure wherein exercise duration and difficulty were increased gradually and according to clients' abilities.

We pursued an iterative approach using sequential focus group sessions to evaluate and refine the PA programs to ensure that they met the needs of participants. The focus group sessions were facilitated by one of two experienced researchers (C. G. or S. P.) who had previous experience in facilitating focus groups but were not health care workers involved in the care of the participants hence avoiding possible coercion and bias. Focus group facilitation was undertaken in the summer and winter of 2014 to evaluate the progress, benefits, and difficulties of the programs at the midpoint (6th months) and endpoint (12th month) evaluation points, respectively. In line with CBPR principles, issues identified at 6 months iteratively helped to refine the programs for the latter 6 months. Informed by grounded theory, themes and developing concepts from earlier focus groups were further explored in the subsequent focus groups.

In conducting the focus group discussions during the evaluative phase, the basic methodological principle of allowing the group to gain its "own structural identity" was followed (Bohnsack, 2004). This gave the discourse the opportunity of focusing on those experiences representing the group's collective experience. Only in the later stages of the focus group did the facilitators guide and return participants to themes that had not organically risen in discussion. A general opening question (*i.e.*, "How has it been participating in the health program(s) you have been involved with?") was posed to participants to initiate the discussion. Further nondirective prompt questions (*e.g.* "Have you observed any benefits/harms in participating?" and "What has worked well for you/what has been difficult for you in the program(s)?") explored benefits and difficulties if not touched on by participants. A question inviting suggestions on how to improve the programs was also asked.

Facilitators ensured a psychologically safe environment by highlighting the rules of confidentiality and respect before the interview. Using a room at the psychosocial rehabilitation center, in which participants identified they felt comfortable, ensured safety of the physical environment. Facilitators used informal and encouraging personal styles; they allowed the group to follow its own themes occasionally

using nondirective questions to clarify understanding. Facilitators observed group dynamics and encouraged participation by all members. The focus groups lasted 60 minutes.

Analysis

The focus groups were audiotaped and transcribed verbatim, and the text was de-identified. Analysis of the transcripts was an iterative process completed by four independent raters (C. G., B. G., L. A., and R. L.). These researchers read and re-read the text, undertaking a close reading of the participants' narratives and being careful to not move too quickly to structure the data. This allowed greater immersion into the data and decreased the likelihood of researcher bias. Thematic analysis was used to examine the data in identifying coding and organization of themes with extracts of text serving as units of analysis. The researchers then took the position of critical peer reviewers, comparing thematic analysis and critiquing emerging themes. Discrepant themes were discussed and resolved by consensus. An exploratory comparison was made between the themes that emerged at 6 and 12 months. NVivo 10 (QSR International Pty Ltd, 2012) was used to systematize themes with coded sections of transposed script. Data saturation was reached after the third focus group at the 6-month evaluation. At this point, no new relevant data emerged; in addition, no new themes emerged in the focus groups conducted at the 12-month evaluation. Results were shared with participants at interactive presentations as a verification process to ensure validity of our findings.

RESULTS

Thirty-three participants started the PA programs (8 men, 25 women). Demographic and diagnostic data are summarized in Table 1.

TABLE 1. Aggregate Demographic and Clinical Characteristics of Participants

Variable	N = 33	
	n	(%)
Sex		
Male	8	(24.24%)
Female	25	(75.76%)
Age range, yrs	26–73 (mean _{age} = 50.09)	
Diagnoses ^a		
Schizophrenia spectrum disorders	8	(24.24%)
Bipolar and related disorders	6	(18.18%)
Depressive disorders	10	(30.30%)
Anxiety disorders	5	(15.15%)
Obsessive-compulsive disorders	1	(3.03%)
Trauma and stress-related disorders	2	(6.10%)
Substance and addictive disorders	1	(3.03%)
Living arrangements (% of sample)		
Rented accommodation ^b	20	(60.60%)
Own home	7	(21.21%)
Own trailer	3	(9.10%)
Live with family members	6	(18.18%)
Live with caregiver	1	(3.03%)
Living alone	13	(39.39%)
Supported/assisted care arrangement	3	(9.10%)

^a Eighteen participants had disorder comorbidity.

^b Rented accommodation includes house and apartment rentals.

At the 6-month program evaluation, three focus groups were conducted with between four and nine participants for a combined total of 21 participants. For demographic details, see Table 2.

At the 12-month evaluation, 2 focus groups were conducted with 10 and 5 participants attending each group, respectively, for a combined total of 15 focus group participants. For demographic details, see Table 3.

Eleven exit interviews were completed. Two participant(s) died during the program, one from cancer and one from a drug overdose. One participant was excluded from the psychosocial rehabilitation center because of behaviors that were incompatible with the group setting, and three participants were lost to follow-up. The reasons participants provided at exit interview for leaving the program are summarized in Table 4.

When considering participant experiences of the programs and perceived benefits, three core categories arose and were agreed upon after an iterative process of analysis (see Table 5).

A. Physical and Psychological Benefits. Participants highlighted themes of direct physical and psychological benefits from participation in all programs. At midpoint, participants noted weight loss, increased endurance, strength, and experiencing less pain. Improvements were also noted in psychological symptoms and improvements to sleep quality, alertness, and mood. At the endpoint (12th month), evaluation participants noted sustained physical and psychological benefits of the programs (see Table 5).

B. Accessibility. Themes of accessibility emerged on three levels: 1) geographic, 2) cost, and 3) program flexibility. Examples of positive outcomes resulting from addressing these themes as well as the negative consequences of not doing so were highlighted by participants.

TABLE 2. Participant Demographics at 6-Month Program Evaluation

Variable	N = 21 n (%)
Sex	
Male	4 (19.04%)
Female	17 (80.95%)
Age range, yrs	26–72 (mean _{age} = 50.0)
Diagnoses ^a	
Schizophrenia spectrum disorders	7 (33.33%)
Bipolar and related disorders	5 (23.81%)
Depressive disorders	6 (28.57%)
Anxiety disorders	6 (28.57%)
Obsessive-compulsive disorders	1 (4.76%)
Trauma and stress-related disorders	2 (9.52%)
Substance and addictive disorders	1 (4.76%)
Living arrangements (% of sample)	
Rented accommodation ^b	11 (52.38%)
Own home	5 (23.81%)
Own trailer	2 (9.52%)
Live with family members	3 (14.29%)
Live with caregiver	1 (4.76%)
Living alone	8 (38.10%)
Supported/assisted care arrangement	2 (9.52%)

^a Eleven participants had disorder comorbidity.

^b Rented accommodation includes house and apartment rentals.

TABLE 3. Participant Demographics at 12-Month Program Evaluation

Variable	N = 15 n (%)
Sex	
Male	4 (26.67%)
Female	11 (73.33%)
Age range, yrs	33–72 (mean _{age} = 53)
Diagnoses ^a	
Schizophrenia spectrum disorders	5 (33.33%)
Bipolar and related disorders	2 (13.33%)
Depressive disorders	4 (26.67%)
Anxiety disorders	5 (33.33%)
Obsessive-compulsive disorders	1 (6.67%)
Trauma and stress-related disorders	1 (6.67%)
Substance and addictive disorders	1 (6.67%)
Living arrangements (% of sample)	
Rented accommodation ^b	8 (53.33%)
Own home	3 (20.00%)
Own trailer	1 (6.67%)
Live with family members	3 (20.00%)
Live with caregiver	1 (6.67%)
Living alone	5 (33.33%)
Supported/assisted care arrangement	2 (13.33%)

^a Eight participants had disorder comorbidity.

^b Rented accommodation includes house and apartment rentals.

B1. Geographic accessibility. Participants identified geographic accessibility as a key factor in program engagement that occurred both within: a) the physical proximity to a venue and b) the psychosocial construct of how comfortable participants felt within the social-spatial context or landscape of the program.

B1a. Physical proximity. Participants highlighted difficulties accessing the sport center for the walking program and yoga studio as they were further away from the ACE center: “I would’ve participated a lot if I didn’t have to go all the way to the (sports center). For me that was just a bit much.”

B1b. Psychosocial accessibility. Focus groups revealed that in addition to identified barriers regarding physical distance to facilities, participants were acutely perceptive about apparent discrepancies in the “fit” between individuals in the MHSU

TABLE 4. Summary of Participant Reasons for Exiting Program

Variable	N = 11 n (%)
Sex	
Male	2 (18.18%)
Female	9 (81.81%)
Reasons for exiting	
Scheduling conflict	3 (27.27%)
Mental health/addictions issues	2 (18.18%)
Medical reasons	4 (36.36%)
Absence from the community	1 (9.09%)
Interpersonal conflict	1 (9.09%)

TABLE 5. Participant-Identified Themes Across Domains of Outcomes

Theme	Exemplary Quote(s)
I. Health Benefits	
1) Physical	<p>“I’m in way better shape than when I started.”</p> <p>“I’ve lost weight, and my hips are feeling better than they used to be and the arthritis is not as bad as it used to be.”</p> <p>“I find it increases your endurance, it’s healthy for you.”</p> <p>“I have seen some strength improvements and some alertness improvements.”</p> <p>“What I find too is when you’re walking...you tend to burn off excess energy and...your quality of sleep improves.”</p> <p>“I’m not needing naps quite as frequently.”</p> <p>“I no longer have...ankle pain all the time.”</p>
2) Psychological	<p>“(Yoga) made me so relaxed...it was just so quiet and peaceful and...your mind just cleared...”</p> <p>“I was very depressed for a long time there, and this has been part of that helping to get out of it.”</p> <p>“I think it’s been a good mood lifter for me.”</p>
II. Accessibility	
1) Geographical	
a) Proximity	<p>“Other people find it’s too difficult to get up there (sports center). There’s issues with transportation...”</p>
b) Psychosocial accessibility	<p>“It was just that they (participants) didn’t feel welcomed by that environment (at the sports facility).”</p>
2) Cost	<p>“The (sport center), it’s a beautiful track, it’s gorgeous, but...a person on disability cannot afford it. It’s a rich man’s track.”</p>
3) Program flexibility	
a) Scheduling flexibility	<p>“I’m so glad that I have that (flexibility) and that the members that are quite regular don’t hold it against me that I’m not able to attend regularly.”</p>
b) Ability leveling	<p>“I love the fact that there’s different groups for different people. So it’s tailored for everybody’s needs.”</p>
III. Relationships	
1) To self	<p>“Self-motivation has to be there otherwise you’re never going to get up from in front of the TV”</p> <p>“Certain participants take it upon themselves to [walk] themselves so...that shows that the program is working because if I’m not there to walk with them and they’re taking the initiative to walk without their peer lead...there’s something happening.”</p>
2) To peers	<p>“It encourages you more because you kind of don’t want to let down the group so you think oh everybody else is going to be there so I’ll be there too.”</p>
3) To community	<p>“I’ve seen (the YMCA instructors) out in the community and we’ve had conversations, like we’re friends...that really makes a difference.”</p>

community and public facilities. They identified their comfort at the psychosocial rehabilitation center and were empowered by the option for the programs to be run from the center: “We’re comfortable here, this is a comfortable safe place (the center) and to me that makes a big difference.”

B2. Cost accessibility. All program costs including classes and transport were funded by the project but even during the early stages of the research, participants expressed concerns regarding cost sustainability: “For some people, that’s food for the month (cost of transportation and facility or class fee), \$20 bucks.” At the 6-month evaluation participants identified similar cost accessibility issues in relation to the yoga program. Specifically, participants noted the relatively high cost of the classes outside of the funded research program. At the 12-month evaluation, the cost associated with programs was still identified as a concern of ongoing sustainability (see Table 5).

B3. Program flexibility. The theme of program flexibility emerged on 2 levels: a) in relation to scheduling and b) ability level. Flexibility

emerged as an essential concept in supporting MHSU participation in the programs.

B3a. Scheduling flexibility. Participants noted that having the option to schedule programs around other commitments (*e.g.*, work) and illness/health relapses was empowering and fostered engagement. The need for programs to not follow a linear progression, which is the normalized expectation of many health programs, and have greater forgiving flexibility was highlighted: “I’m (the peer lead) trying to do the personal scheduling so that it’ll fit into their (participants’) schedule and they’ll be encouraged to do it more. It just makes it a little bit easier for them and that’s very important, I find.”

B3b. Ability leveling. A broad range of both age and physical ability was observed in the MHSU community. To accommodate all individuals’ needs, minimize barriers and enhance participant participation, programs were tailored so as to be accessible to all levels of ability: “I have a real problem with medications... so I might have to go back to the beginning (walking) group

again and so I've got both there for me when I'm feeling good and when I'm not."

C. *Relationships*. Themes of relationships to 1) self, 2) to peers, and 3) to the community were highlighted by participants.

C1. Relationship to self. Participants noted the programs as contributing to gains in 1) personal autonomy, 2) self-esteem, and 3) decreased self-stigma all of which contributed to personal empowerment for behavior change: "[Participants] are becoming more self-driven"; "...my self-esteem is much better. It was really, really low before"; "[yoga] teach[es] acceptance of yourself...it's...just acknowledging where you are, rather than striving for something or comparing to someone else."

At the 6- and 12-month focus groups participants commented they had begun to feel self-driven and felt encouraged to try other things while exercising on their own: "I walk several times a week but I do it independently"; "after work I would just spend a half an hour working out on the treadmill and bicycle and then exercise on my own and I would never have done that before." Peers highlighted autonomous changes that occurred with them taking ownership of their programs: "I want to schedule [exercise] to their schedule and I want to do what they want to do. So it's not going to be the circuit anymore so that was my own idea." Decreases in self-stigma were also evident as participants progressed through the PA programs: "I'm always afraid everybody's staring at me...[the walking program] made a huge difference because of this I'm now doing more and I'm feeling better about it."

C2. Relationship to peers. Changes in peer relationship dynamics produced social motivators to health behavior change. This occurred via: 1) a sense of accountability and relatedness to their peers: "A group activity gives you more incentive to do the walking...like you say you're accountable to someone else"; "I think we have built a good rapport with the group that we've got and getting to know everybody's personality has helped figure out what's going to motivate us better"; 2) the value of friendship in supporting participation by making activities intrinsically pleasurable: "Talking makes the time go faster"; it's "more of a game"; "we made good friends; we've become friends"; 3) Group strength in facing stigma in the community: "walking in a group, you have the support and strength from your peers rather than being intimidated or anxious with strangers on the street. That coward mentality of finding an isolated, scared person, head hanging down, that's a mark (for them) but those cowards aren't going to intimidate a group."

Challenging relationship dynamics occurred for the peer leads. Participants wanted peer leads to display more nurturing feedback and support: "then this peer lead would say oh you're just lazy...and it's like we don't come here to be insulted"; and peer leads wanted to develop abilities in addressing conflicts within the groups: "it was quite frustrating when different things happened, conflict in the room, that I didn't have any guidance at all. I was floundering." A peer lead training program was therefore collaboratively developed and implemented; as part of this the participants decided to produce guidelines of practice within the group activities. Endpoint evaluation focus groups showed the number of occurrences of group conflict had greatly reduced and conflict was no longer a threat to the integrity and viability of the programs: "I think [having guidelines] helped." "It [conflict] got better from when we first started"; "In the yoga we've had a bit of an issue with [a participant] and...our peer leader I think is very good at stepping in and saying okay, class is starting."

C3. Relationship to community. Bidirectional changes in relationship dynamics between the self and community allowed health behavior to widen beyond the psychosocial center. This occurred via:

1) decreased stigma enabling participants to extend their PA beyond the ACE (self-to-community relationships): "...the other thing is outside of the (center), ...in the (community) walking group that happens, I'm part of that family now too"; and 2) participants commented that in relation to the researchers and community instructors there was a sense of equality, openness and being valued as individuals, which extended beyond the program to the community, further helping to decrease social and self-stigma (community-to-self relationships): "I know most of the walls of the center, on the street say hi to each other and that's a real human connection"; "I've seen [the instructors] out in the community and we've had conversations, like we're friends...that really makes a difference."

DISCUSSION

Although many PA health programs are provider-developed and peer-supported, the aim of this study was to evaluate innovative peer-developed and peer-led PA programs for MHSUs. We believe this is the first reported evaluation of such a health program approach in this population. Although indices such as weight loss, body mass index, and cardiorespiratory fitness were not the primary outcomes assessed in the current research, we provide qualitative evidence of benefits to provide context. Benefits of provider-developed lifestyle interventions for MHSUs have been highlighted by previous studies (e.g., Bartels et al., 2013, 2015; Daumit et al., 2013; Green et al., 2015). This study shows clear feasibility and acceptability of peer-developed, peer-led programs showing benefits to engagement, social inclusion, and participant wellbeing.

This project successfully used peer leads to help develop and implement the PA programs, allowing incorporation of the known benefits of peer leadership (Ginis et al., 2013; Solomon, 2004). Our findings, however, highlight not only positive aspects of peer leadership but also difficulties that can arise, which have not been reported in the literature to date. Specifically, midpoint evaluation showed participants identified interpersonal conflict as a threat to program integrity particularly in the walking program, which was completely organized and run by MHSUs (i.e., no community instructor). In some situations, peer leads felt participants were not attending as agreed and some participants felt the actions of certain peer leads unsupportive. Peer leads felt they did not have adequate skills to effectively resolve conflict and during the focus groups, spontaneously identified they wanted further training in this area. Researchers and peer leads collaboratively developed and implemented a peer leadership program using a toolkit arising from the initiative, which ensured comparable standards between facilitators. The concept of conflict was obviously identified at the midpoint evaluation, and in accordance with grounded theory, this concept was represented to the participants at the endpoint focus groups. Researchers were surprised that no further issues of conflict were identified with participants having praise for the skills of the peer leads indicating the effectiveness of the training.

Findings from this study suggest integration of peer lead coaching and leadership skills development will be required if pursuing this type of model of peer-developed and peer-led health behavior change programs.

As researchers deeply engaged with and immersed in the participant narratives and group's lived experiences, we reviewed core categories and how they were related to the organizing concepts, and category integration and theory development occurred. We theorize that engagement in health behavior programs by MHSUs resides in accessibility, while behavioral change resides in co-constituent relationships (to self, peers, and community).

Accessibility concepts related to geography in both distance and psychosocial fit, cost, and program flexibility in concert laid

the foundation for engagement in PA programs. Accessibility has been identified by other researchers as a key facilitator enabling MHSUs to live healthy lifestyles (Graham et al., 2014; Browne et al., 2016; McKibbin et al., 2014; Naslund et al., 2016); however, this accessibility revolves around knowledge of available programs, costs, and transport. To our knowledge, this is the first study to identify geographical accessibility in terms of psychosocial belonging as a concept to be considered in MHSUs' engagement and participation in lifestyle interventions.

We found behavior change was facilitated by relationships, a finding consistent with studies reporting a link between peer support and positive health outcomes (Aschbrenner et al., 2016, 2017). Through a qualitative methodology and approach, our findings provide a rich understanding of this association. We found changes in relationship to self seen via increased autonomy, relatedness, and competence resulted in participants' volitional motivation for health behavior change, consistent with the SDT literature (Deci and Ryan, 2000; Ryan et al., 2008). Although SDT traditionally conceptualizes behavior change as occurring at the level of the individual (Deci and Ryan, 2000), our findings suggest that autonomy, competence, and relatedness also reside within the interactions and relationships at the level of peers and community. At the peer level, we found gains in competence and relatedness in terms of accountability, connectiveness, and making healthy activities more intrinsically fun as contributing to improved health behavior. At the level of community, we saw increased autonomy, through MHSUs' ownership of programs, and relatedness to the wider community, expressed via decreased stigma, as consolidating change.

This development of theory of engagement and change has direct implications for program development with MHSUs, and additionally, we feel that the theory is sufficiently abstract to be applicable to other settings and other disadvantaged populations.

Dropout is a challenge in this population. Some studies show programs of PA and targeted behavioral interventions having higher attrition rates for MHSUs than in control participants (Brown and Chan, 2006; Kemp et al., 2009). Our relatively high retention rate (66.6%) for a group of MHSUs affected by severe and comorbid diagnoses may indicate an effective innovative approach for such MHSUs. Throughout the project, we found the need for *forgiving flexibility* relating to scheduling and accepting participants will need the opportunity to leave and pick up again with the program because of illness relapse and psychosocial difficulties. This project by nature of being a linear research project was unable to accommodate the degree of nonlinear flexibility required. We had 11 participants leave the project, 55% caused by mental health and physical illness relapse, and 45% caused by scheduling difficulties and psychosocial issues leading to extended absences from the community.

Limitations of the study include selection bias as individuals self-selected for the study and attended a psychosocial rehabilitation center. The use of economic incentives for research participation may have resulted in participants being motivated by compensation rather than wanting to contribute to the project; however, the researchers had a prior relationship with the community mitigating this and participants frequently forgot to request the gift card associated with participation. This resulted in motivated participants providing rich material within the focus groups. The study population is from a rural city in Northern British Columbia; however, this adds depth and extends our understanding of program development and evaluation in MHSU populations compared with similar research undertaken with urban populations.

CONCLUSIONS

This research shows the feasibility and acceptability of peer-developed and peer-led health behavior programs. The research provides a strong foundation for future work in the area of theory of engagement and change in health improvement for MHSUs and disadvantaged populations. Integration of concepts of accessibility and relationships

to enhance improved health behaviors may produce empowering outcomes for disadvantaged groups similar to our current findings. Further replicative work in other environments will be required to see if generalizability beyond this population occurs.

ACKNOWLEDGMENTS

The authors thank the BC Schizophrenia Society and the mental health service users of the Activity Centre for Empowerment, Prince George, British Columbia, Canada.

DISCLOSURE

This research has been funded in part by grant number UNR12-0791 awarded to Dr Graham by the Vancouver Foundation. The funders have had no role in the preparation of the article.

The authors declare no conflict of interest.

REFERENCES

- Armstrong ML, Korba AM, Emard R (1995) Mutual benefit: The reciprocal relationship between consumer volunteers and the clients they serve. *Psychiatr Rehabil J*. 19:45–49.
- Aschbrenner KA, Mueser KT, Naslund JA, Gorin AA, Zawacki SA, Pratt SI, Kinney A, Bartels S (2017) Facilitating partner support for lifestyle change among adults with serious mental illness: A feasibility pilot study. *Community Ment Health J*. 53:394–404.
- Aschbrenner KA, Naslund JA, Shevenell M, Kinney E, Bartels SJ (2016) A pilot study of a peer group lifestyle intervention enhanced with mHealth technology and social media for adults with serious mental illness. *J Nerv Ment Dis*. 204:483–486.
- Ashton M, Mulconray S, Weston M, Rigby A, Galletly C (2013) Peer workers' role in smoking cessation groups for people with mental illness. *Australas Psychiatry*. 21: 246–248.
- Barre LK, Ferron JC, Davis KE, Whitley R (2011) Healthy eating in persons with serious mental illnesses: Understanding and barriers. *Psychiatr Rehabil J*. 34:304–310.
- Bartels SJ, Pratt SI, Aschbrenner KA, Barre LK, Jue K, Wolfe RS, Xie H, McHugo G, Santos M, Williams GE, Naslund JA, Mueser KT (2013) Clinically significant improved fitness and weight loss among overweight persons with serious mental illness. *Psychiatr Serv*. 64:729–736.
- Bartels SJ, Pratt SI, Aschbrenner KA, Barre LK, Naslund JA, Wolfe R, Xie H, McHugo GJ, Jimenez DE, Jue K, Feldman J, Bird BL (2015) Pragmatic replication trial of health promotion coaching for obesity in serious mental illness and maintenance of outcomes. *Am J Psychiatry*. 172:344–352.
- Bohnsack R (2004) Group discussion and focus groups. In Flick U, von Kardoff E, Steinke I (Eds), *A companion to qualitative research* (pp 214–221). London: Sage Publications.
- Brown S (1997) Excess mortality of schizophrenia. A meta-analysis. *Br J Psychiatry*. 171:502–508.
- Brown S, Chan K (2006) A randomized controlled trial of a brief health promotion intervention in a population with serious mental illness. *J Mental Health*. 15: 543–549.
- Browne J, Mihos P, Penn DL (2016) Focus on exercise: Client and clinician perspectives on exercise in individuals with serious mental illness. *Community Ment Health J*. 52:387–394.
- Chinman M, George P, Dougherty RH, Daniels AS, Ghose SS, Swift A, Delphin-Rittmon ME (2014) Peer support services for individuals with serious mental illnesses: Assessing the evidence. *Psychiatr Serv*. 65:429–441.
- Corbin J, Strauss A (2015) *Basics of qualitative research: Techniques and procedures for developing grounded theory* (4th ed). Thousand Oaks: Sage Publications.
- Corrigan PW, Roe D, Tsang HWH (2011) *Challenging the stigma of mental illness: Lessons for therapist and advocates*. West Sussex: Wiley.
- Daumit GL, Dickerson FB, Wang NY, Dalcin A, Jerome GJ, Anderson CA, Young DR, Frick KD, Yu A, Gennusa JV, Oefinger M, Crum RM, Charleston J, Casagrande SS,

- Guallar E, Goldberg RW, Campbell LM, Appel LJ (2013) A behavioral weight-loss intervention in persons with serious mental illness. *N Engl J Med*. 368:1594–1602.
- Deci EL, Ryan RM (2000) The 'what' and 'why' of goal pursuits: Human needs and the self-determination of behavior. *Psychol Inq*. 11:227–268.
- Dickerson FB, Savage CL, Schweinfurth LA, Medoff DR, Goldberg RW, Bennett M, Lucksted A, Chinman M, Daumit G, Dixon L, DiClemente C (2016) The use of peer mentors to enhance a smoking cessation intervention for persons with serious mental illnesses. *Psychiatr Rehabil J*. 39:5–13.
- Druss BG, Zhao L, von Esenwein SA, Bona JR, Fricks L, Jenkins-Tucker S, Sterling E, DiClemente R, Lorig K (2010) The Health and Recovery Peer (HARP) Program: A peer-led intervention to improve medical self-management for persons with serious mental illness. *Schizophr Res*. 118:264–270.
- Filik R, Sipos A, Kehoe PG, Burns T, Cooper SJ, Stevens H, Laughame R, Young G, Perrington S, McKendrick J, Stephenson D, Harrison G (2006) The cardiovascular and respiratory health of people with schizophrenia. *Acta Psychiatr Scand*. 113:298–305.
- Ford P, Clifford A, Gussy K, Gartner C (2013) A systematic review of peer-support programs for smoking cessation in disadvantaged groups. *Int J Environ Res Public Health*. 10:5507–5522.
- Ginis KA, Nigg CR, Smith AL (2013) Peer-delivered physical activity interventions: An overlooked opportunity for physical activity promotion. *Transl Behav Med*. 3:434–443.
- Graham C, Griffiths B, Tillotson S, Rollings C (2013) Healthy living? By whose standards? Engaging mental health service recipients to understand their perspectives of, and barriers to, healthy living. *Psychiatr Rehabil J*. 36:215–218.
- Graham C, Rollings C, de Leeuw S, Anderson L, Griffiths B, Long N (2014) A qualitative study exploring facilitators for improved health behaviors and health behavior programs: Mental health service users' perspectives. *ScientificWorldJournal*. 2014:870497.
- Gray CM, Hunt K, Mutrie N, Anderson AS, Leishman J, Dalgarno L, Wyke S (2013) Football fans in training: The development and optimization of an intervention delivered through professional sports clubs to help men lose weight, become more active and adopt healthier eating habits. *BMC Public Health*. 13:232.
- Green CA, Yarborough BJ, Leo MC, Yarborough MT, Stumbo SP, Janoff SL, Perrin NA, Nichols GA, Stevens VJ (2015) The STRIDE weight loss and lifestyle intervention for individuals taking antipsychotic medications: A randomized trial. *Am J Psychiatry*. 172:71–81.
- Holt RI, Busche C, Citrome L (2005) Diabetes and schizophrenia 2005: Are we any closer to understanding the link? *J Psychopharmacol*. 19:56–65.
- Israel BA, Eng E, Schulz AJ, Parker EA (2005) *Methods in community-based participatory research for health*. San Francisco: Jossey-Bass.
- Israel BA, Schulz AJ, Parker EA, Becker AB (1998) Review of community-based research: Assessing partnership approaches to improve public health. *Annu Rev Public Health*. 19:173–202.
- Jain S, McLean C, Adler EP, Rosen CS (2016) Peer support and outcome for veterans with posttraumatic stress disorder (PTSD) in a residential rehabilitation program. *Community Ment Health J*. 52:1089–1092.
- Kemp V, Bates A, Isaac M (2009) Behavioural interventions to reduce the risk of physical illness in persons living with mental illness. *Curr Opin Psychiatry*. 22:194–199.
- Laursen TM (2011) Life expectancy among persons with schizophrenia or bipolar affective disorder. *Schizophr Res*. 131:101–104.
- McCreadie RG (2003) Diet, smoking and cardiovascular risk in people with schizophrenia: Descriptive study. *Br J Psychiatry*. 183:534–539.
- McIntyre RS, Konarski JZ, Wilkins K, Soczynska JK, Kennedy SH (2006) Obesity in bipolar disorder and major depressive disorder: Results from a national community health survey on mental health and well-being. *Can J Psychiatry*. 51:274–280.
- McKibbin CL, Kitchen KA, Wykes TL, Lee AA (2014) Barriers and facilitators of a healthy lifestyle among persons with serious and persistent mental illness: Perspectives of community mental health providers. *Community Ment Health J*. 50:566–576.
- Mezuk B, Eaton WW, Albrecht S, Golden SH (2008) Depression and type 2 diabetes over the lifespan: A meta-analysis. *Diabetes Care*. 31:2383–2390.
- Miyamoto Y, Sono T (2012) Lessons from peer support among individuals with mental health difficulties: A review of the literature. *Clin Pract Epidemiol Ment Health*. 8:22–29.
- Naslund JA, Aschbrenner KA, Scherer EA, McHugo GJ, Marsch LA, Bartels SJ (2016) Wearable devices and mobile technologies for supporting behavioral weight loss among people with serious mental illness. *Psychiatry Res*. 244:139–144.
- Nolte EC, Martin M (2008) Measuring the health of nations: Updating an earlier analysis. *Health Aff (Millwood)*. 27:58–71.
- Olsson M, Gerhard T, Huang C, Crystal S, Stroup TS (2015) Premature mortality among adults with schizophrenia in the United States. *JAMA Psychiat*. 72:1172–1181.
- QSR International Pty Ltd (2012) NVivo qualitative data analysis software, Version 10.
- Robson D, Gray R (2007) Serious mental illness and physical health problems: A discussion paper. *Int J Nurs Stud*. 44:457–466.
- Ryan RM, Patrick H, Deci EL, Williams GC (2008) Facilitating health behavior change and its maintenance: Interventions based on self-determination theory. *European Health Psychologist*. 10:2–5.
- Saarni SE, Saarni SI, Fogelholm M, Heliövaara M, Perälä J, Suvisaari J, Lönnqvist J (2009) Body composition in psychotic disorders: A general population survey. *Psychol Med*. 39:801–810.
- Saha S, Chant D, McGrath J (2007) A systematic review of mortality in schizophrenia: Is the differential mortality gap worsening over time? *Arch Gen Psychiatry*. 64:1123–1131.
- Simoni JM, Franks JC, Lehavot K, Yard SS (2011) Peer interventions to promote health: Conceptual considerations. *Am J Orthopsychiatry*. 81:351–359.
- Solomon P (2004) Peer support/peer provided services underlying processes, benefits and critical ingredients. *Psychiatr Rehabil J*. 27:392–401.
- Soundy A, Faulkner G, Taylor A (2007) Exploring variability and perceptions of lifestyle physical activity among individuals with severe and enduring mental health problems: A qualitative study. *J Ment Health*. 16:493–503.
- Thornicroft G (2011) Physical health disparities and mental illness: The scandal of premature mortality. *Br J Psychiatry*. 199:441–442.
- Ussher M, Stanbury L, Cheeseman V, Faulkner G (2007) Physical activity preferences and perceived barriers to activity among persons with severe mental illness in the United Kingdom. *Psychiatr Serv*. 58:405–408.
- Vazin R, McGinty EE, Dickerson F, Dalcin A, Goldsholl S, Oefinger Enriquez M, Daumit GL (2016) Perceptions of strategies for successful weight loss in persons with serious mental illness participating in a behavioral weight loss intervention: A qualitative study. *Psychiatr Rehabil J*. 39:137–146.
- Webel AR, Okonsky J, Trometa J, Holzemer WL (2010) A systematic review of the effectiveness of peer-based interventions on health-related behaviors in adults. *Am J Public Health*. 100:247–253.
- World Health Organization (2016) *Global report on diabetes*. Geneva: World Health Organization.