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Developing a Community-Based Tailored Exercise Program for People With Severe and Persistent Mental Illness

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Abstract

Background—People with severe and persistent mental illness (SPMI) are at a greater risk of medical issues compared with the general population. Exercise has a positive effect on physical and mental health outcomes among this population in community settings.

Objectives—To describe community-based participatory research (CBPR) methods used to tailor an exercise program among people with SPMI, demonstrate its impact, and present lessons learned for future research.

Methods—The partnership developed a project to explore the feasibility of implementing a physical activity program at a community agency among clients with SPMI.

Lessons Learned—Data showed improved trends in mood, social support, and physical and mental health outcomes. Facilitators and barriers must be carefully considered for recruitment and retention.

Conclusions—A gender-specific, group-based, tailored exercise intervention developed through collaboration with a community agency serving people with SPMI using CBPR methods is feasible. Keywords: Community-based participatory research, severe and persistent mental illness, exercise, community partnership, sustainability

Approximately one-fourth of U.S. adults experience a diagnosable mental disorder each year, contributing to 25 years of life lost to disability and premature mortality.¹ The definition of SPMI varies by state; it is regularly used to identify a group of mental disorders often affecting people during early adulthood, namely, schizophrenia, schizoaffective disorder, bipolar disorder, major depression, autism, and obsessive-compulsive disorder.² SPMI relates to a long history of hospitalizations, dangerous or disturbing social behaviors, and/or an inability to carry out basic work- and non-work-related functions without

assistance.³ Lifestyle issues, including cigarette smoking, poor physical fitness, and poor nutrition, lead to a greater risk of medical issues among people with SPMI compared with the general population.^{4,5} People with SPMI may experience limited life satisfaction based on poor living conditions, lack of and discontent with social relationships, lack of health services, and unemployment.⁶ Unfortunately, stigma, weight gain from medication, and physical ailments can negatively affect symptoms, self-esteem, and the pursuit of life fulfillment among this population.⁷ The opportunity to have normality in their lives, reassuring relationships, and gratifying leisure time is important among this population in the community settings.⁸ However, many people living with SPMI experience cognitive limitations, poor self-motivation, and decreased social communication, which are barriers to participation in lifestyle interventions.⁹

A rigorous literature review undertaken by the authors showed that exercise is one recognized way for improving physical and mental health outcomes among people with SPMI. The review also revealed that health benefits of exercise among those living with SPMI include improvements in psychosocial and mental health functioning; improved mood; reduction in body mass index, weight, and other anthropometric measures; and increased mobility and strength. Most of these studies have been controlled trials; to date, few studies have shown significant improvements from exercise interventions in the actual community setting among people with SPMI. Among existing research, several factors have been found to impact negatively this populations' participation in exercise interventions, including lack of self-motivation, scheduling conflicts, medical issues, cognitive deficits, self-stigma, and levels of diminished endurance compared with the general population.^{10–14} More work is needed to design and tailor exercise programs to increase participation and ultimately improve the health of this population.

CBPR is a useful approach for designing and piloting such an exercise intervention for people with SPMI. CBPR contributes to increased buy-in of marginalized communities and increased likelihood of both successful research and uptake of intervention practices,¹⁵ and is an equitable partnership in research, involving community members and academic researchers.^{15–17} CBPR has been used in exercise interventions among different populations.^{18–22} The rigorous literature review indicates there is a dearth of literature regarding exercise interventions focused on people with SPMI in the community adopting such an approach. The use of a CBPR approach can increase our ability to tailor the intervention to the needs of the community and ensure the community's needs are addressed.²³

The aims of this paper are to 1) describe CBPR approach and research methods used to develop a project to address exercise promotion among people with SPMI, 2) explore the impact of the exercise program on participants, the agency and the community, and 3) present implications for future research based on lessons learned.

METHODS

This CBPR project was developed from an existing relationship between the chief executive officer (CEO) of Community Human Services (CHS), a local service organization located in

a neighborhood in Pittsburgh, and a doctoral student from the University of Pittsburgh Graduate School of Public Health. CHS was formed to serve the community of South Oakland more than 30 years ago and expanded to serve the greater Pittsburgh area. CHS programs include homeless assistance, mental health programs, and health and wellness and family assistance programs for those who suffer socio-economically. CHS has provided residential programming for individuals living with mental illness for more than 30 years.

Weekly visits by the student to CHS related to or outside of the research allowed this partnership to grow through staff and consumer/community member conversations and interactions at weekly socials. A research opportunity emerged naturally when the CEO expressed the need to design an exercise program for people with SPMI. Given the doctoral student's background, training, and interest in exercise and CBPR, the community-academic partnership jointly developed the proposal and secured support from a local foundation for implementation. The partnership involved CHS staff members including the CEO, the residential manager, interested case managers (CMs), Physical Activity Leaders (PALS), interns working at CHS, and researchers from the University of Pittsburgh. The community included members working at CHS and those served by CHS and the surrounding vicinity in South Oakland. The two-phase CPBR project included 1) formative research used to design the intervention and 2) a pilot of the intervention. Members in the partnership were involved significantly in both phases of the project. The CEO was a co-investigator; CHS staff, interns, PALS, and university researchers were involved in the design, implementation, data collection, analysis, and dissemination. Participants provided input in phase one through focus group feedback which were co-facilitated by university researchers and CHS staff, and in phase two participants provided ongoing feedback during the pilot.

Design

Using a pre-post descriptive design, a pilot project was conducted to explore the feasibility of implementing an exercise program at CHS among clients with SPMI and to gather data about the impact on the well-being of participants.

Population and Recruitment

Participants included men and women who met the following inclusion criteria: satisfying conditions for SPMI, age 18 or older, physician's clearance, and current enrollment in a CHS program. Exclusion criteria were current or past episodes of violence or self-reported active substance abuse as reported by CMs and diagnosis of cognitive impairment. CMs introduced the intervention to potential participants using a structured script to inform residents without having specific diagnoses on recruitment flyers that could possibly increase stigma among participants. Based on review of CHS records, approximately 40 clients met the criteria of the approximate 200 consumers served by CHS. CHS CMs and staff consulted individually with clients to gauge participation interest; CMs referred interested participants to the research team for recruitment and did not share the specific diagnosis of individuals according to HIPPA regulations. Research staff conducted the informed consent process. After participants had an opportunity to ask questions about the study, participants gave written consent. The study was approved by the University of Pittsburgh Institutional Review Board (PRO12050697).

Intervention Development

Three focus groups took place at CHS over a 2-week period in November 2012 including two female ($n = 5$; $n = 3$) and one male focus group ($n = 6$) among people with SPMI at CHS to understand their perceptions, knowledge, and attitudes toward physical activity. Those results indicated people with SPMI at CHS understood the benefits of exercise, willingness to participate, and specified perceived benefits, barriers, facilitators, and preferences regarding the possibility of an exercise program in the community. This research confirmed that a tailored exercise program was a logical next step to addressing this population's needs at CHS. Figure 1 gives an overview of the partnership and process; Figure 2 provides an overview of the timeline.

Intervention

The “On the Move” intervention was designed using feedback from the Focus Group Discussions (FGDs). It consisted of two 40-minute exercise sessions per week (two for men, two for women) held at CHS. The sessions were co-led by the university researcher with credentials as a personal trainer and group exercise instructor, two students with exercise training, and a CHS CM, all of whom received training by the university researcher. Instructors were called “Physical Activity Leaders” (PALS). Sessions comprised low-impact aerobics using video tapes and instruction, and low-impact strength training with neoprene dumbbells, exercise bands, medicine balls, and chairs for modified exercise. Healthy lunches were provided to participants on exercise days. A contest was developed to encourage participation based on similar studies.^{13,24} Based on the percentage of sessions attended, participants received project-branded exercise merchandise.

Data Collection

The team systematically collected daily notes to document the process and PALS recorded notes and attendance after sessions. The university researcher met weekly with PALS and bimonthly with community–academic team members. The team used an investigator-designed survey combining instruments available in the literature to measure demographic characteristics, mental and physical health,²⁵ mood,²⁶ perceived social support,^{27–29} and motivation.³⁰ PALS and the university researcher administered the survey at baseline and at the end of the 10-week program. The survey was pretested with CHS research team members to account for participant burden and compression. The PI administered the survey face-to-face while the PALS observed to ensure consistency in inquiries. The PALS recorded changes in mobility weekly using the Timed Get up and Go Test (TUG).³¹ Water bottles and \$20 gift cards were provided for the participants' time and efforts for survey completion.

An open ended questionnaire adapted from other studies^{14,32,33} was administered after the intervention by the CMs assigned to each participant. It focused on participant satisfaction with classes, perceived impact of the program on health, and suggestions for improvement. The PI discussed the outcomes of the survey with the CMs.

Data Analysis

Statistical analyses consisted of descriptive statistics, including means, standard deviations, paired *t*-tests, and logistic regression modeling. Stata software version 12.0 was used to

perform TUG test regression analysis; SPSS version 20.0 was used for pre-post analysis. Descriptive case studies were developed through analysis of systematically collected notes, observations, and post-survey questionnaires and are included in the results and impact on participants' sections.

RESULTS

Sample

Of 40 potentially eligible participants, 16 entered the program; most were female (56%) and non-Hispanic White (43.75%; Table 1).

Retention

Of the 16 enrolled participants, 5 (31%) participated regularly (i.e., approximately one-half or more of the sessions) and 11 (69%) did not (mean, 5.6; median, 3; range, 0–17; interquartile range, 1–11.5; $n = 19$ sessions). Reasons for infrequent participation included increased mental health symptom severity; conflict in participation owing to official disability status, complex service schedules, and exacerbation of medical issues related to obesity. More men than women terminated participation after enrolling (85% vs. 56%, respectively), citing reasons such as conflicts with other scheduled activities, expressed lethargy, and sleeping late. Table 2 provides total hours of exercise participation per participant, and reasons for nonparticipation based on participant feedback and staff observation and knowledge.

Impact on Participants

The survey showed improved trends in mood (positive affective score, $p = .67$; negative affective score, $p = .25$), social support ($p = .09$), and physical health ($p = .705$) as well as mental health ($p = .93$) outcomes. The TUG test results showed improved mobility among those that participated regularly ($p = .25$).

Although some participants experienced barriers to participation, feedback shows that the intervention was well-received and led to perceived improvements in health. Many of the participants expressed improvement in fitness or perceived social support regardless of the number of sessions attended. Table 3 provides details on the postintervention questionnaire.

To further describe participants' experiences, the following case studies were prepared by compiling observations and information from the post-survey feedback forms to represent gender and participation status.

Female Participant A—Participant A was between 45 and 64 years of age and received psychiatric services for 26 to 30 years. Over 200 pounds and morbidly obese, she explained that she could not tie her shoes and had to visit the doctor for toenail cutting. She progressed through the sessions from seated exercise modifications to regular exercise without modification. In week 4, she brought healthy snacks to class, demonstrating her commitment to the class and a healthier lifestyle. In week 9, she proudly told the PALS that she purchased 2-pound weights and was able to tie her shoes. When asked what she liked about

the program, she said, “The fact that a highly-trained individual would spend time with mentally ill people.” When asked if she felt more physically fit as a result of the exercise, she said, “Very. [It] boosted my self-confidence and discipline to exercise ... It felt special, I was cared for by [the instructor] and the [PALS].”

Female Participant B—Participant B was between 45 and 64 years of age and received psychiatric services for between 1 and 5 years. She shared with PALS that she had severe depression, affecting her ability to wake up at a regular time to do household chores. At first, she was hesitant to be involved in group exercise and exercised in a space away from others. Halfway through the program, she increased her interaction with female participants during lunch. The university researcher and PALS observed that she was stronger; in week 8, her exercises were modified to be more challenging, yet still low impact. At the end of 10 weeks, she expressed fear that the program would end and her previous levels of depression might return. She stated that she plans to exercise on a weekly basis at home using the exercise guides developed by the program because, “it is important for my physical and mental health.” When asked if the program was beneficial to her, she answered, “very beneficial, working out greatly improved my mood and feelings.”

Male Participant C—Participant C was between 18 and 30 years of age, and received psychiatric services between 1 and 5 years. Before the program started, he expressed his desire to lose weight and concern about his personal fitness. He missed class owing to holidays or job interviews. When asked what made him feel comfortable during the exercise sessions, he said, “When I was feeling depressed, people [involved with the program] gave me energy.” When asked if the program was beneficial, he responded “very beneficial. I found different techniques and motivation with music much easier to exercise to than on my own.”

Female Participant D—Participant D was 45 to 64 years of age and received psychiatric services for over 30 years. During her pre-intervention survey, she inquired about one-on-one personal training, stating she may not be as active as other participants in the class. She was enthusiastic at the first session; exercises were modified to match her fitness level. Owing to unexpected circumstances and deterioration in her physical health, she was unable to continue. She was given a copy of the take-home exercise guide. Although she ceased participation in the sessions, she joined the PALS and other women for lunch. In reference to the session she attended, she said, “[We] felt treated as equals ... [I liked] the encouragement from the instructors.”

Male Participant E—Participant E was 18 to 30 years of age, and received psychiatric services for 16 to 20 years. When approached to enroll in the exercise program, he declined. He discovered a close peer was enrolled and decided to enroll. Attending only two sessions, it seemed that his participation depended on whether his peers participated, which was confirmed by the CMs. Referring to the sessions he attended, he said, “[The exercise] stretched me out, made me feel better about myself, [I] didn’t get any cramps in the middle of the night.” He plans to continue exercising on a weekly basis using a friend’s equipment.

Similar to female participant D, participant E regularly sought out the university researcher and PALs to have lunch together.

Impact on the Agency and Community

Details of the impact on these levels are provided in Table 4. At the agency level, CHS staff involved in the research gained a deeper understanding of the intervention; consistent team meetings strengthened the partnership's effectiveness. The program had positive and negative effects on other CHS staff (Table 5). Regarding program development, CHS staff members and CMs were enthusiastic about the program, but were also overburdened with the extra work needed to carry out the program. Some CHS staff were eager to participate in the sessions, whereas others felt disconnected from the program. The community showed interest in participating in the sessions and contacted the university researcher about participation, availability of take-home guides, and community resources. When a follow-up program to On the Move was announced based on feedback from the participants and staff, community members contacted CHS staff to sign up.

LESSONS LEARNED

On the Move was a gender-specific, group-based exercise intervention developed via intensive collaboration with a community agency serving people with SPMI. It was tailored to fit the perceived exercise benefits, barriers, and preferences of people served by the agency. The case studies and post-program survey suggest that people with SPMI can benefit from a tailored exercise program. Success, challenges, and lessons learned in conducting CBPR to address the intersection of exercise and mental illness were identified as a result of this project.

The lessons learned from PAL observations are presented in Table 6. The PALS tailored the sessions based on the expressed needs of the participants; during the 10-week program, modifications were necessary based on participants' preferences, limitations, or improvement. Despite rescheduling sessions to fit participants' needs, conflicts arose weekly for some participants. Several PALS are necessary to lead sessions to ensure individual support and modifications are available based on participants' progression. Interaction among PALS and participants outside the sessions built a sense of connection and improved participants' comfort levels with PALS.

Strengths

The CBPR approach in this pilot, based on mutual trust and respect for roles in the partnership, was critical to its development and implementation in this community setting among such a vulnerable population. Despite the small sample and high attrition, the team was able to use other sources of data to elaborate on the impact of the program.

Limitations

The scope of the pilot is relatively small; caution should be taken when generalizing to other communities or CBPR partnerships. Future studies should aim for a larger sample size based on lessons learned in this research regarding recruitment and retention. Selection bias could

be a factor among participants already engaged in exercise. Response bias could also be a factor among participants because the principal investigator conducted the pre-intervention surveys and the PALS conducted the postintervention surveys. Funding and availability of staff for motivation and follow-up were also limitations.

CBPR Process and Impact

The design and development of the intervention involved all partners. CHS staff brought invaluable experience in knowledge and understanding of the participant population, community setting, and social dynamics. The university researchers brought experience in research, implementation, data collection and analysis, and exercise. This partnership led to participation from some CHS staff during the initial recruitment, but motivation remained difficult among other CHS staff to encourage participation among their clients. Part of this could be related to the staffs' perceived wellness. Individuals who do not value exercise or have limited physical capacity may not advocate effectively for these types of activities. Developing a worksite wellness program alongside the exercise program for people with SPMI could create a normative wellness atmosphere.^{19,22,34} Significant investment was put into relationship building among PALS and participants, building trust. Through regular meetings with the research team, challenges and successes were recognized early and addressed. The presence of the university researcher at CHS on a weekly basis showed the commitment to the research. The project-induced time spent outside the sessions is just as important as time spent during the sessions; the social interaction and acceptance, especially given the self-perceived and society-induced stigmas associated with their diagnoses, is important to this population.

Recruitment

Although similar methods of recruitment from other studies were used,^{14,35} it was difficult to obtain the desired number of participants. The timeline for recruitment, given complications related to the population's diagnoses, should be carefully planned. Some complications among people with SPMI can include the nature of symptoms among different diagnoses. People with schizophrenia often experience paranoia and a lack of emotional involvement with others.¹² People with SPMI can experience symptoms, including lethargy, disorientation, appetite changes, weight gain, hot flashes, and sweating, which can also be a side effect of their medications. This population may experience disassociation, fatigue, hopelessness, and helplessness, affecting their willingness and ability to participate in exercise.^{36,37} Symptom recognition and management must be recognized as a part of recruitment and motivation. Using CMs to recruit may have been more effective if CMs had a specific role in the program. Although it was difficult to arrange regular meetings with CMs, it could have been helpful to schedule one-on-one meetings to determine how to address barriers to recruitment, their involvement as well as participants' retention (i.e., transportation, scheduling). Future programming should consider selecting champions—individuals who support increased exercise and have already changed their exercise habits—among staff as PALS and including it in their job descriptions, with related compensation through discounted gym memberships or other incentives. Identification of champions among participants could be a peer-to-peer model to improve enrollment, especially among those with a positive experience with the program. Perceived benefits and barriers to

participation were discovered through initial FGDs; addressing benefits and barriers during recruitment and enrollment may have an effect on recruitment.

Retention

Consistent engagement with the participants was challenging. Women adhered more regularly to the exercise sessions than men; despite reminders including pre-exercise announcements, after the fifth week a majority of the men dropped out. The high attrition rates could be linked partly to the severity of participants' diagnoses, adherence to pharmacologic treatment, employment, and other conflicting schedules as noted in other studies.^{10,38,39} There are gender differences in recovery patterns and severity of disorders.^{40,41} Postintervention FGDs could be useful in future research to determine facilitators or barriers among those who decided to enroll and participate in the exercise versus those who declined to participate; the outcomes could help to discover additional factors influencing this populations' intent to participate in structured group exercise. It may also be useful to have ongoing, facilitated discussions with the participants regarding barriers and facilitators to participation. Future programs could consider identifying active/regular participants and serve as peer promoters with recognition in the community as opposed to providing incentives.

IMPLICATIONS FOR FUTURE RESEARCH AND PRACTICE

There are important elements outlined in this paper that should be considered when adapting a program akin to this pilot program.

Encourage Open Communication

All roles, responsibilities, and expectations of partnership members should be clarified early through transparent dialogue. Regular team meetings allowed for a venue to discuss the process and as a result the partnership became stronger and more effective. A debriefing plan was established to ensure staff had a confidential outlet to share information.

Maintain Flexibility and Rigor

In this study, an iterative process of documentation and ongoing discussion allowed for modification of the exercise sessions and other components while ensuring the core structure was intact. In CBPR processes, it is accepted to "let go of the planning" and allow for this iterative process to occur.⁴²

Disseminate Results

Ensuring that research findings are disseminated back to the community to inform and translate findings for change at the individual, organizational, community, and policy levels is one of the basic principles of CBPR.⁴³ The team discussed this early in the design. Mental/behavioral health stakeholders were engaged early and a grant to support a community and stakeholder dissemination strategy and development of satellite exercise centers at CHS was secured. Local insurance companies expressed interest in supporting activities that improve overall health outcomes of their members.

Anticipate Community–Academic Pressures

During the initial months of the study during the institutional review board approval process, frustration arose among some CHS staff and potential participants, and enthusiasm for the program waned because of delays. True cooperation takes significant time throughout the research. As highlighted in Table 5, the university researcher could devote more time to the intervention, whereas some CHS staff have multiple priorities to manage; this was a barrier for staff wanting to participate more readily. These types of “insider–outsider” pressures can arise from differences in timetables and priority attributed to the research among partners,⁴⁴ and need to be understood and addressed accordingly.

Recognize Socioecological Interactions

In this community, three levels interacted: CHS staff and participants, participants and other clients, and participants and members of the community. Each interaction throughout the intervention had an impact on participants; awareness of these interactions is important. The relationships observed during class and the new sense of connection and civic responsibility were evident through participants bringing healthy snacks for the group. Green and Glasgow⁴⁵ emphasize the importance of program elements aligned with multiple levels including policy, regulatory, or among individuals representing organizations or whole communities, a concept called *ecological alignment*, wherein there is an appreciation for interdependence of levels in a collective system.⁴⁵ This concept is critical when working in this type of multilevel community setting. Future studies may want to include constructs from the socioecological model when designing an exercise intervention for this population. The socioecological model takes into account the numerous levels interacting in this study. Studies demonstrate the value of applying the socioecological model within a multilevel community settings when designing exercise interventions.^{46–48}

Identify Social Networks and Opportunities for Diffusion

As noted in Table 3, social support from the exercise instructors and co-participants was a motivating factor to engage in exercise. Social network size and social support are linked to improved recovery for people with SPMI,^{49,50} and is understudied among this population who want to be involved in regular exercise.⁵¹ Psychiatric symptoms among this population are probably some of the most important factors associated to life satisfaction; deficits in social well-being result mainly from the severity of illness.⁷ Future research should consider the impact of social networks regarding motivation to exercise among this population.

CONCLUSION

This article described a CBPR project developed to address exercise promotion among people with SPMI, illustrated the impact on people with SPMI, the agency, and the community, and presented lessons learned. Using CBPR in this setting, although challenging given the complex dynamics among people with SPMI and within the community, is critical to the successful design and implementation of effective community-based programs.

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Figure 1.
Overview of the Partnership and Process

Timeline for On the Move	Persons Involved	May	June	July	August	Sept	October	November	December
Activity		Recruitment and sensitization for staff and participants							
Develop overview materials for Case Managers (CM) meetings	KH, AW								
Develop overview materials for possible Physical Activity Leaders	KH, TS								
Create master list of CMs and PALS to be trained	AW, DM								
Meet with CMs re: MI training and program details	KH, AW, DM								
Sensitize CMs on recruitment of participants	KH, AW, DM								
Outreach to PALS	AW								
Final list of CMs for MI training	AW, DM								
Final list of staff/students for PAL training	KH, AW, TS								
Recruit participants for intervention	AW, DM, CMS								
Informed consent among participants	KH, CMS								
Obtain medical clearance from all participants	KH, CMS								
Follow up with participants to ensure medical clearance is still valid, able to participate	KH, PALS, DM								
Activity		IRB approval							
Contact IRB and start process of approval	KH, JB								
Follow up for final IRB approval	KH, JB								
Activity		Trainings for research staff implementing program							
Personal training certification renewed	KH								
MI training May 23-25	KH								
Group exercise certification	KH								
Activity		Training for CHS staff, supervision and follow up							
Training on Schizophrenia for staff	DM								
Contact Dr. Cluss to organize MI training protocol	KH								
Solidify dates for MI training	KH, PC								
Develop MI training manual outline	KH, PC								
Development and pretesting of MI training manuals and agenda	KH, PC, AW								
MI training for CMs	KH, PC								
Development of draft PAL manuals, the "basics"	KH, AW, TS								
Develop PAL training draft guidelines	KH, AW, TS								
PAL training	KH, TS								
Activity		Tailoring of physical activity and roll out							
Literature review and discussion about physical activity among people with SPMI and previous focus group discussion (FGD) topics/ questions	KH, AW								
Development of draft focus group discussion (FGD) questionnaires and pre-testing	KH, AW, DM								
FGDs at Lawn Street and Wood street	KH, TBD								
Development of physical activity program	KH, AW, DM, TS								
Finalization of PAL guidelines and final part PAL training based on FGD outcome	KH, AW, TS								
Incentives for participants distributed	CHS STAFF								
Participant enrollment in PA activity	KH, TS								
PA activity	KH, PALS, TS								
Post intervention FGDs with participants	KH, CHS STAFF								
Activity		Implementation of intervention							
Development of incentive structure for participation	KH, AW, DM								
Review of SF-12 form with staff to ensure feasibility in administration	KH, AW, DM, CMS								
SF-12 pre-intervention among participants and non-participants	KH, CMS								
Implementation begins—ongoing	KH, PALS, AW, DM								
Recording of compliance to PAL sessions	PALS								
SF-12 post-intervention among participants and non-participants	KH								
Activity		Analysis of results							
Initial analysis of SF-12 pre-intervention surveys	KH, AW								
Analysis of FGDs	KH, AW, DM								
Analysis of SF-12 post-intervention results	KH, AW								
Analysis of post qualitative survey	KH, AW								
Activity		Dissemination and follow up							
Organize central location for all program materials	KH, TS								
Begin documentation of program activities	KH, PALS								
Start write up of results from FGDs for dissemination	KH, PALS								
Write up of program outcomes and dissemination plan	KH, AW								
Activity		Ongoing reporting							
Develop reporting plan: process, outcome reporting	KH, AW								
Updates on number of trainees recruited, number of materials developed, number of outreach sessions	KH, AW								
Updates on number of staff trained, pre-post test results after training, number of participants enrolled in intervention	KH, AW								
Documentation of process outcomes	KH, PALS								

Figure 2.
Timeline of Intervention

Table 1

Demographic Characteristics of the Participants

Characteristics	Total, n (%)
Age (y)	
18–30	3 (18.75)
31–44	4 (25.00)
45–64	7 (43.75)
65	2 (12.50)
Race/ethnicity	
Non-Hispanic White	7 (43.75)
Non-Hispanic Black	6 (37.50)
Hispanic	0 (0.00)
Other	2 (12.50)
Unknown	1 (6.25)
Gender	
Female	9 (56.25)
Male	7 (43.75)
Years spent in CHS-supported housing	
< 1	4 (25.00)
1–3	5 (31.25)
4–6	4 (25.00)
7–9	2 (12.50)
10	1 (6.25)
Years receiving psychiatric services	
< 1	2 (12.50)
1–5	3 (18.75)
6–10	1 (6.25)
11–15	1 (6.25)
16–20	2 (12.50)
21–25	1 (6.25)
26–30	2 (12.50)
> 30	4 (25.00)

Table 2

Reasons for Nonparticipation in Exercise Program Among Participants

Participant and Gender	Minutes of Exercise During 10 Weeks	Reasons for Nonparticipation ^a
3—Female	680	Family-related travel
5—Female	680	Weather
7—Female	600	Knee pain, weather
2—Female	560	Transportation, weather
8—Female	160	Conflict with disability office
4—Female	40	Sick roommate, pinched nerve, toothache, apt. Self-conscious of not being able to keep up with exercise group, needed one-on-one encouragement and support, taking care of sick roommate
6—Female	0	Transportation
9—Female	0	Unknown
1—Female	0	Transportation, forgot; severity of disease disabled her from participation
14—Male	360	Job interview, travel
10—Male	160	Work Used own weights to exercise in room
11—Male	160	Sick, didn't feel like it
13—Male	80	Didn't feel like it, not in mood; lack of peer participation
12—Male	40	Conflicting appointments; didn't like the first aerobic session attended
15—Male	40	Exercises were too hard; exacerbated medical conditions related to obesity
16—Male	40	Worked out before sessions
Average	225	

^aBased on participant feedback, staff observation, and knowledge.

Table 3Post-Survey Qualitative Responses (On the Move^d)

Questions	Regular Participants (Attending Approximately One-Half or More of the Sessions)	Nonparticipants, Irregular Participants
Open-ended questions: Female responses^d		
What did you like?	Strength exercises Lunches , getting together with others to work out Reminders PALS wanted participants to enjoy exercise & not just work hard PALS made their own “video” (live choreographed sessions) to work out more, asked participants to contribute songs to work out to	Shown other ways to do exercises (modifications) Teachers were interesting
What made you feel comfortable during sessions?	Emotional support from PALS, PAL instructions, PAL attitudes (laughing/joking) If tired, allowed to sit down or given water Finally getting the chance to exercise, doing cardio/stretching Urinary incontinence and issues associated; felt ashamed, that she was annoying other people	PAL encouragement Felt treated as equals It was optional
What made you feel uncomfortable during sessions?	Fast exercises (“Denise Austin lost me a long time ago”) One instructor didn’t seem to have her heart fully in the exercises and was distracting ^b	
Do you feel more physically fit as a result of the exercise sessions?	More than before Yes . . . “I feel improvement in the right direction”	“I only went to one session, but yes, felt very happy to be there”
How beneficial was the exercise program to you?	Separation between strength/cardio helped understand exercises better	It was a healthy option
Do you plan to continue exercise on a weekly basis? Why or why not?	Yes, continue exercising, lose weight, tone muscles Yes, “I need to lose weight and it helps build muscles and reverses age-related deterioration”	Maybe walking up steps, waking up daily, helps to continue exercising
What would help you continue?	Workout buddy	Positive motivation would help me continue Need motivation-more one on one encouragement, support and training
What suggestions do you have for improve future exercise programs?	More exercise to music instead of videos More variety of videos Mat/floor work to get a more full benefit Have everyone make their own video (choreographed sessions)	More instruction on how to properly complete exercises and activities Encouragement, little incentives, one on one training, “I really like the booklet, I have been using it a little bit” Less smoking cigarettes, more water
Open-ended questions: Male responses		
What did you like?	Constant moving	Lunch, PALS Gave him energy, woke him up, good workout Videos, instructors, music, exercising with other people Stretched him out, made him feel better about himself, didn’t get cramps in the middle of the night
What made you feel comfortable during sessions?	Collaboration with a group of people	Having other people around – made it very comfortable People made him feel at home

Questions	Regular Participants (Attending Approximately One-Half or More of the Sessions)	Nonparticipants, Irregular Participants
What made you feel uncomfortable during sessions?		Had to sit down and could not keep up with people
Do you feel more physically fit as a result of the exercise sessions?	Yes	Yes
How beneficial was the exercise program to you?		“If I could have stuck it out it would have been very beneficial to me” ^c
Do you plan to continue exercise on a weekly basis? Why or why not?		Yes, walking mostly, lots of stairs Yes, but not related to On the Move (was exercising before and only attended one class) Yes, will use friend’s weights
What would help you continue?	Music would help to continue and a healthy diet	If exercise group was at location of resident (WSC); group walks, Wii system games
What suggestions do you have for improve future exercise programs?		Some type of exercise open in morning before work Prefer evening sessions; too much standing No sweating to the oldies (Richard Simmons); interested in open gym option Lots of weights and resistance bands; before lunch, good music, “ . . . something to loosen you up, get you going, ‘sounds of nature’” Get the Wii hooked up

Abbreviation: PAL, physical activity leader.

^aData not included here are written up in case studies as quotations or feedback among case studies).

^bDiscussion after the intervention to screen further PALS to ensure maturity, knowledge, and attitude are appropriate for this type of group exercise instruction.

^cParticipant who had to stop attending owing to serious health issues.

Responses in **bold** indicate item appears three or more times

Table 4

Impact of Research on Participants, Agency, and Community

Activities	Impact
Participant level^a	
Implementation of On the Move exercise sessions	Improved physical and mental health
	Improved self-confidence
	Increased social interaction
	Desire to continue
Dissemination of results to participants	Understanding of results of exercise
	Appreciation of involvement in evolving design of exercise program
Agency level^b	
Involvement of staff in research	Ownership, trust built within partnership
Invitation for staff participation	Staff participation, deeper understanding of intervention
Development and availability of PAL Manual	Opportunity to create training of trainers model to root program within the agency
Ongoing meetings with all members of research team	Ability to solve process issues and reach consensus on next steps
Dissemination of results to staff	Staff interest in program and continuation
Documentation of lessons learned	Additional funding availability for continuation
Community level^c	
Development of On the Move resource guides	Expansion of opportunities for people in the community living near and users of CHS services in the community to exercise
Development of On the Move exercise manual	Opportunities for community to exercise independently
Dissemination of results to community	Community appreciation to the agency for creating an opportunity to exercise

Abbreviations: CHS, Community Human Services; PAL, Physical Activity Leader.

^aData collected from pre–post surveys and postintervention interviews.

^bData collected from discussions with CHS staff and daily observations.

^cData collected from discussions with participants and community members. Community included members working at CHS and those served by CHS and the surrounding vicinity in South Oakland.

Table 5

Positive and Negative Impacts of Program on Agency

Positive Impact	Negative Impact
Program development	
Case managers glad to be involved and receive training related to motivation for participants that could be used in other areas in addition to exercise	Staff frustrated with length of time taken to start exercise sessions Staff overwhelmed with numerous emails from PI
Staff appreciated having PI on site and willing to travel to different CHS locations and being flexible to the needs of the organization and staff	Staff felt extra burden to recruit participants, obtain medical clearances
Exercise sessions	
Staff enthusiastic about participating	Not all staff exposed to the sessions owing to job constraints and ability to attend sessions
Case managers appreciative of PI notifying them when assistance needed	Staff experienced a disconnect from the program as it was perceived as "the PI's program," not owned by staff
Good relationship developed by several case managers and the PI	Staff frustrated when program ended with no follow-up planned
Staff appreciative of post-program dissemination and opportunity to provide feedback	
Data collection	
Staff invested in project through involvement, sharing of community knowledge and expertise, and data collection and analysis	Staff weren't as concerned with the nuances of the data; more focused on the participants' responses

Abbreviations: CHS, Community Human Services; PI, principal investigator.

Table 6**Lessons Learned from On the Move Exercise Sessions**

Lesson	Rationale
Importance of scheduling sessions based on participants' needs – but can't always capture all	Men's sessions moved from 10 to 11 am to accommodate sleeping in Some men felt new 11 am start interfered with their typical lunch hour Some men had weekly doctor's appointments at that time and can't attend
Recognize importance of warm-up and cool-down	Changed music to match slower pace of movements PALS needed to explain the purpose of warm-up and cool-down so that participants know the importance
Alter routines from feedback	Men didn't favor cardio videos; therefore, PALS designed cardio and strength routines which were well-received Women did not enjoy certain videos; as a result, they were removed from aerobic exercise rotation
Provide exercise modifications	Introduce regular exercise and two modifications, one more challenging and one less so to cater to all fitness needs of participants
Have two to three PALS at each session	When less than two PALS were present, it was difficult to lead an exercise session that was effective for all participants regarding ability to modify for individuals while continuing the flow of class Participants need extra attention because of low experience level with exercise One-on-one attention important in helping participants feel included and cared for
Provide water at each session	Participants often forgot water bottles; providing water to ensure participants are hydrated throughout the workout prevented dehydration
Maintain positive environment	Personality clashes occurred between participants; it is important to be conscious of participant spacing and encouraging all levels of participation equally
Maintain interactions outside of sessions	Joining participants during their lunch hour seemed to build their trust and comfort level with PALS

Abbreviation: PAL, Physical Activity Leader.