



Incorporating a Physical Activity Program into an Assertive Community Treatment Team: Impact and Strategies

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Abstract

The objective of this brief report is to present an overview of the main benefits and key characteristics of an individualized physical activity program delivered by an assertive community treatment team in Ottawa, Canada. A mixed-method case study was conducted over a 9-month period. Findings revealed significant reductions in weight, BMI and waist circumference ($p < .05$) and improvements in self-esteem, autonomy, socialization and other health behaviors. Key characteristics of the program included building a relationship of trust with clients and deploying active efforts to eliminate barriers to PA engagement. Results offer preliminary evidence for integrating an individualized PA program into the ACT team model.

Keywords Severe mental illness · Physical activity · Assertive community treatment · Weight · Lifestyle

Introduction

Regarded as a gold standard in community-based approaches for treating persons living with severe and persistent mental illness (e.g., schizophrenia, bipolar disorders), assertive community treatment (ACT) is an evidence-based approach focused on intensive treatment, support, and rehabilitation (Bond et al. 2001; Dixon 2000). The ACT team framework has received extensive support and it has been shown to improve functional deficits and reduce hospitalizations (Aagaard et al. 2017; Bond et al. 2015; Schöttle et al. 2018). The client base served by ACT teams has a history of frequent and prolonged hospital admission as well as a high need for health and social services. This clientele is well known to have higher rates of comorbid medical and behavioral conditions, such as diabetes and smoking, compared

to the general population (De Hert et al. 2011). Individuals with severe mental illness are more susceptible to developing obesity and attributes of the metabolic syndrome, adverse byproducts of psychotropic medication use and a sedentary lifestyle (Vancampfort et al. 2015). This complex pattern of physical, social and functional difficulties is associated with higher rates of morbidity and mortality and lower quality of life (Liu et al. 2017).

There is mounting evidence for the benefits of physical activity (PA) as an adjunct treatment to pharmacotherapy in people with severe mental illness (Lederman et al. 2017; Rosenbaum et al. 2014; Vancampfort et al. 2010). As an amendable behavior, PA has the potential to prevent or attenuate weight gain and improve body composition parameters such as waist circumference as well as cardiometabolic risk factors (Bartels et al. 2013). PA can also help alleviate psychiatric symptoms and psychosocial adversities (Alexandratos et al. 2012). PA programs for individuals with severe mental illness delivered in the community have shown some promise (Galletly et al. 2009; Lederman et al. 2017), though more studies are needed. In particular, there is a lack of knowledge regarding the nature of interventions used by health professionals, in terms of techniques and strategies used to engage clients, as well as *how* programs are delivered to- and experienced- by participants (Alexandratos et al. 2012; Quirk et al. 2017).

The multidisciplinary ACT model is particularly suited for making lifestyle improvements in this population

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(Vanderlip et al. 2017; Weinstein et al. 2011). In the Netherlands, for example (Looijmans et al. 2017) have designed a randomized trial to test the effects of a multidimensional lifestyle intervention that is implemented by ACT team nurses trained in motivational interviewing. In parallel, in Ottawa, Ontario, Canada, leaders of one ACT team responded to troubling rates of cardiometabolic ailments and sedentary behavior in their clients by developing an individualized PA program, which has been running for several years. We conducted a mixed-method case study to assess the program's influence on biopsychosocial indices and to document the perceptions, interactions and intervention strategies among participants and staff. This study was conducted in collaboration with key stakeholders from the ACT team; health indices and program elements of interest were chosen based on their pertinence to the team's daily practice and were deemed relevant in the broader literature context by the researchers. In this report, we present an overview of primary outcomes and explore key program characteristics and their impact on its success.

Methods

The PA Program

The clientele for this particular ACT team is comprised of roughly 80 francophone patients aged 16 years or older. Embedded in the ACT team's structure through scheduled visits with clients, the PA program is individualized to clients' interests, exercise and health goals, and level of physical and social functioning. One health professional staff member who initiated the program serves as a "leader" while other staff members also conduct PA sessions. Gym sessions (e.g., resistance and/or aerobic training, sporting activities such as basketball, etc.) typically occur at a community fitness centre, with some sessions occurring at participants' homes (e.g., walking). The program is rolled-out in a continuous fashion, either in groups or one-on-one. At the onset of the study, between 40 and 45 clients were partaking in the PA program in some form or another.

Study Design

This research was construed as a pilot feasibility study to determine whether a large evaluation and implementation study could be conducted. Specifically, we conducted a case study over a 9-month period beginning in April 2015. We used a mixed methods approach to evaluate physical health parameters and to gather in-depth insights from a sample of clients and staff members. In this brief report, we focus on the primary outcomes of weight, body mass index (BMI), waist circumference and blood pressure and on qualitative

findings. Additional measures that were administered and that will be considered in future analyses include blood samples and psychosocial questionnaires.

Participants

With guidance from the ACT team staff members, we recruited a small purposive sample of clients according to whether the clients were new to the PA program or whether they had been regular attendees. In a purposive sample, participants are selected based on characteristics of a population (i.e. diagnostic characteristics of ACT team) and the objective of the study. In total, 16 clients were approached about the study and one client was excluded post-consent due to outstanding circumstances surrounding their care. Fourteen clients aged between 25 and 64 years (mean = 42.5 years) took part in the baseline quantitative evaluation with one client dropping out of the PA program (i.e. 13 at endpoint). Over half of the participants were male ($n = 8$). The most common diagnosis was schizophrenia ($n = 8$) followed by bipolar disorder ($n = 6$). Three clients also had concurrent substance use problems. A subsample of participants (two men, two women; mixed diagnoses) agreed to partake in qualitative interviews.

We also recruited a convenience sample of five health professional staff members (3 men, 2 women) with direct experience implementing the PA program to participate in qualitative interviews. Staff participation in the interviews occurred on a first come first served basis. In keeping with the ACT model, health professions varied (e.g., nurse, social worker etc.) and years of experience in mental health service delivery ranged from 6 to 16 years.

Procedures and Analyses

Quantitative health measures (e.g., weight, waist circumference, blood pressure) were collected at baseline and 9 months later by program staff and investigators. Semi-structured interviews were conducted by the primary investigator on two occasions with staff and on three separate occurrences for clients (baseline 3 and 9 months). Conducting multiple interviews over time enabled the research team to appreciate the dynamic dimension of participants' experiences and evolution while enrolled in the PA program. The recorded interviews were transcribed verbatim.

Quantitative data were cleaned and summarized using descriptive statistics. Differences between time points were analyzed using the nonparametric Wilcoxon signed rank test for paired data given the small sample size and deviations from normality. For qualitative data, applied thematic analysis (ATA) (Guest et al. 2012) was conducted whereby two independent investigators coded and re-coded the text to identify central thematic constructs. The goal of ATA

is to produce a thematic pattern in order to describe the research phenomenon. Quotes were translated in-house by the research team from French (language of interview) to English.

This study received appropriate university and hospital (ACT team affiliate) institutional review board approval and all participants provided informed consent. The authors report no conflicts of interest and certify responsibility for the manuscript.

Results

Quantitative Findings

Although participants were on average overweight (onset and termination), we observed a significance reduction in weight (pounds) from baseline (Mean = 218.15, SD = 50.56) to 9-months (Mean = 204.85, SD = 42.57), $z = -3.18$, $p = .001$, and in BMI (kg/m^2) from baseline (Mean = 32.51, SD = 6.43) to 9-months (Mean = 30.54, SD = 5.38), $z = -3.18$, $p = .001$. Four clients maintained a stable weight, six clients lost between 7 and 15 lb, and three clients lost between 19 and 47 lb. Waist circumference (cm) was significantly lower at 9-months (Mean = 111.00, SD = 13.18) compared to baseline (Mean = 117.58, SD = 16.25), $z = -2.94$, $p = .003$. There were no significant changes in systolic [$z = -0.59$, $p = .56$] or diastolic [$z = 0.53$, $p = .60$] blood pressure measurements (mmHg).

Qualitative Findings

Overall, clients and staff reported diverse and complementary biopsychosocial benefits of the program. Specifically, the benefits of the program reported by patients and staff could be summarized as follows:

- Weight loss and related effects (e.g., fitting in clothes).
- Endurance.
- Pride (being active).
- Look or feel healthier and well.
- Improvements in other health behaviors (e.g., eating habits, smoking).
- Socialization.
- Builds routine.
- Facilitates other goals, functioning.
- Autonomy (e.g., taking the bus).

In particular, one of the unique aspects of the program was that engaging in PA provided some clients with the incentive to make more generalized lifestyle changes in line with newfound mobility, weight loss and sense of wellbeing. For others, the PA program provided an outlet

for managing symptoms: “Yes, it [attending the gym] helps. You see, when you are stuck at home it causes you to hear voices because you are trapped, you don’t have anyone, you explode. It just helps.” (Client).

According to the staff, the PA program also had sweeping benefits by providing structure and feelings of competency and productivity:

We have some people for who [the program] has changed their lives. To go from lying all day long to just beginning to be more active...Sure they have the benefits of PA (weight loss)...but on a social and mental health level, some of them just hear so many voices that they are stuck at home, in their own heads. But now, they are able to go out and engage in a normalizing activity in the community and trans- pose that to other things as well. (Staff).

In regards to the nature of the client-centered program itself, clients, and staff members in particular, highlighted several characteristics and strategies of the program that are conducive to engaging clients in PA:

- Part of the care plan: Along with priorities of stabilizing client mental health and optimizing pharmacotherapy, it is incentivizing to recognize PA as part of a client’s care plan, treatment objectives, and overall rehabilitation.
- Climate of trust: Through personal experience and an appreciation for sport and exercise imparted by staff, clients should feel safe and supported when initiating exercise. When staff members display confidence in the gym, in walking groups, etc., an atmosphere of reassurance and partnership is established.
- Progressive initiation: Due to symptoms of lethargy, anhedonia and general wariness, it is critical to introduce the idea of exercise gently, often “planting the seed” with a simple visit of the fitness center or a walking circuit. Through progressive exposure and observation, clients begin the program (sometimes at home) and may gradually be integrated into group sessions.
- Eliminate barriers, provide routine: Important strategies for clients in the early stages include ensuring transportation and adequate clothing, giving reminders, and being mindful of social scrutiny in public contexts. For many clients, the regularity of PA sessions can be extremely useful. The #1 objective is that clients are present and active.
- Adaptability, flexibility: At times, adapting the schedule is required, particularly in the early stages of program adoption, as some clients for instance can exhibit atypical wake/sleep cycles. Flexibility is also required in terms of activity type and intensity at each session. For instance, with clients experiencing the aftereffects of drug and

alcohol consumption, their presence and effort should be acknowledged and their goals revisited.

- Respect interests, abilities: It is important to provide options for PA as clients may gravitate to exercises they performed at previous times in their lives and that are suited to their abilities. For this ACT team, a home-based walking program was well suited to one female client with severe arthritis whereas basketball free-throw challenges kept one male client attending weekly.
- Continuous effort, engagement: Reiterating motivational “pep talks”, morning wake-up calls, and monitoring client progress (e.g., weight measurements) can be indispensable in ensuring long-term participation and providing a “coaching” element that clients value.
- Integrate autonomy (long-term): When clients have maintained a functional routine, staff members can work on initiating self-directed activity such as walking goals on non-scheduled days. The consistency of the PA program provides an opportunity to work on client autonomy, for example taking the bus to the fitness facility or attending medical appointments on their own.

Discussion

Results of this case study revealed the successes and particularities of an individualized PA program implemented by health professionals of an ACT team. Over a 9-month period, biopsychosocial and functional benefits were observed. There is a well-supported weight gain trajectory for antipsychotic medication, particularly among naive users (De Hert et al. 2011). We did not see any weight gain during the study period, which in addition to an overall decrease in BMI and waist circumference, speaks to the program’s preventive potential over time. As highlighted by participants, improvements in body composition and morphology are important not only from a metabolic perspective, but also in terms of esthetics (e.g., confidence in one’s skin) and motivation to continue with PA (Firth et al. 2016).

Generalized improvements in motive, purpose and capacity for daily activities were a significant benefit of the program, which may be attributable to the regularity of PA sessions, a concern for diminishing barriers to engaging in PA, and the important social bond that was created between clients and staff through PA. This is consistent with evidence that exercise supervision consisting in professional support results in better adherence and outcomes in people with severe mental illness (Firth et al. 2016) and highlights the importance of individualized (meaningful) approaches to care.

ACT is modeled around a multidisciplinary team that collaborates to provide individualized support and treatment (DeLuca et al. 2011). It is within this explicit structure that

the client-centered PA program was delivered successfully. The mental health expertise of staff was indispensable, as reflected in characteristics of the program deemed critical by clients and staff (e.g., continuous effort during relapses, adaptability). Knowledge of symptom presentation, illness trajectory, and client histories likely gives ACT professionals an advantage over traditional personal training for this clientele, by also developing ways of engagement that go beyond the medical outcomes of PA. Indeed, the program reflects more of an approach to care; that is, PA becomes a form of intervention through which other therapeutic gains may be envisioned (e.g. self-worth, autonomy, etc.).

The limitations of this pilot study include the small sample size and the lack of measurements of weekly attendance and the intensity and volume of PA achieved in and outside of the program. In addition, given the type of sampling and recruitment employed, characteristics of our participants, including the low proportion of substance abuse among clients may not be representative of the full ACT team clientele. However, it should be noted that generalization of findings is not typical of case studies nor feasibility inquiries such as ours. Future research should consider examining additional and more varied health parameters and objective measures of PA. In addition, given the positive results of this study, future research ought to consider more rigorous designs that include random sampling and comparisons to (including randomization) to a control group that does not partake in the PA program. In addition to methodological aspects, we recommend that future research consider intervention mapping in order to associate the strategies identified in this and other studies with well-supported theoretical constructs in order to advance a community-based, individualized intervention framework that can be implemented on a larger scale (Galletly et al. 2009; Michie et al. 2005).

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Compliance with Ethical Standards

Ethical Approval All procedures performed in this study involving human participants were in accordance with the 1964 Helsinki declaration and its later amendments or comparable ethical standards and with the ethical standards of two institutional research committees, that is, the University of Ottawa and the ACT team affiliate hospital.

Informed Consent All participants provided informed consent.

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