Mental Health and Physical Activity 12 (2017) 73–82

Contents lists available at ScienceDirect

Mental Health and Physical Activity

journal homepage: www.elsevier.com/locate/menpa

'Join The Walk?': Short-term and follow-up effects of a 10-week walking intervention in patients with a mental disorder

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ARTICLE INFO

Article history:
Received 1 July 2016
Received in revised form
6 January 2017
Accepted 27 February 2017
Available online 6 March 2017

Keywords:
Exercise
Intervention
Pedometer
Physical activity
Psychological illness

ABSTRACT

Purpose: This study investigated the short-term and follow-up effects of a 10-week walking intervention on physical fitness, physical activity, anxiety and depression in patients with a mental disorder.
Method: A 2 × 3 repeated measures design was used, with condition (intervention/control) as between-subject variable. Participants in both conditions (intervention, $n = 91$; control, $n = 44$) were adult members of the Flemish federation for Sports and Recreation in Mental Health Care. They were diagnosed with a mental disorder such as mood (44.4%), psychotic (28.7%) and/or anxiety disorder (21.3%). Physical fitness, physical activity, anxiety and depression levels were assessed before (pre) and after (post) the intervention and six months later (follow-up). The intervention was based on Self-Determination Theory and embedded in existing associations of the Flemish federation for Sports and Recreation in Mental Health Care. Participants in the intervention received a personalized pedometer-based walking schedule, a weekly group walk and guidance by a walking coach.
Results: There were no significant interaction effects between time and condition for any of the outcomes. However, from pre to post, self-reported physical activity increased significantly across conditions ($p < 0.05$).
Conclusions: The findings suggest that patients with a mental disorder who engage in a physical activity intervention study, increase their self-reported physical activity levels at short term.
ClinicalTrialsID: NCT02079012.

The burden of mental disorders is growing, with significant health and social consequences worldwide (World Health Organization, 2016). Patients with a mental disorder have a shorter life-expectancy (Thornicroft, 2013) and a reduced quality of life. This is not only a direct consequence of their condition but also indirectly caused through stigmatization (Corrigan & Watson, 2002) and through comorbid physical illness (Newcomer, 2007). For example, meta-analyses have shown that a severe mental disorder heightens the risk of metabolic syndrome (Vancampfort et al., 2015b) and of diabetes type 2 (Vancampfort et al., 2016).

There are many types of mental disorders, such as anxiety disorder and depression. Worldwide, approximately one out of six people suffers from any anxiety disorder during his lifespan (Kessler et al., 2009) and currently 350 million people are affected by depression (World Health Organization, 2015). Notably, other types of mental disorders such as substance-abuse (National Alliance of Mental Illness, 2016) or psychosis (Veras, do-Nascimento, Rodrigues, Guimarães, & Nardi, 2011), are often related to feelings of anxiety and/or depression.

Conventional treatment of mental disorders by means of medication is often accompanied by numerous side effects (National Institute of Mental Health, 2016) and it is therefore important to explore alternative ways of treatment. Amongst others, physical activity (PA) has been suggested as an alternative strategy in the treatment process (Wolff et al., 2011). PA has been associated with a number of beneficial outcomes, including cardiorespiratory fitness and lower all-cause mortality (Lee et al., 2011), physical health (e.g., decreased risk of diabetes type 2), but also mental health (Centers for Disease Control and Prevention, 2015). Antidepressant and anxiolytic effects of PA have been proposed (Ströhle, 2009). A recent meta-analysis indicated that exercise has a large and significant antidepressant effect in people with depression and that this effect had been underestimated due to publication bias (Schuch et al., 2016). Research even suggests a

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http://dx.doi.org/10.1016/j.mhpa.2017.02.005
1755-2966/

protective effect of PA on the development of certain mental disorders such as an anxiety disorder (Ströhle et al., 2007).

Nevertheless, people with a mental disorder are generally not physically active. In a sample of 165 adults with mild to moderate symptoms of anxiety/depression, a low compliance to PA guidelines was shown as well as a negative relationship between depressive symptoms and light PA (Helgadóttir, Forsell, & Ekblom, 2015). Another study showed that patients with severe mental illness were more likely to perform no PA at all than a matched sample from the general population (Daumit et al., 2005). In addition, inverse relationships between depressive symptoms and physical fitness have been demonstrated (Sui et al., 2010). Nonetheless, research on PA as a treatment for patients with a mental disorder is sparse (Zschucke, Gaudlitz, & Ströhle, 2013).

The current study focuses on one particular type of PA, i.e. walking. This low-cost activity can be performed alone or in group and at a wide range of skill levels and intensities, especially at lower intensity. This is important because research has indicated a lack of light intensity PA in people with mild to moderate depression and/or anxiety disorder symptoms (Helgadóttir et al., 2015) as well as a lack of any PA in people with a severe mental disorder (Daumit et al., 2005). Walking is a form of PA that is preferred by and appropriate for people with a mental disorder (Daumit et al., 2005; Richardson et al., 2005; Soundy, Muhamed, Stubbs, Probst, & Vancampfort, 2014a). A systematic review concluded that walking can alleviate depressive symptoms in people with depression (R. Robertson, A. Robertson, Jepson, & Maxwell, 2012). Another systematic review concluded that walking can decrease BMI at short term in people with a schizoaffective disorder (Soundy et al., 2014a). However, both of these reviews included only a limited number of studies. Moreover, these studies were conducted in selective samples and offered a restricted view of outcomes that are relevant to the clinical practice.

Walking interventions seem a viable means to promote walking, although their clinical benefits are uncertain (Ogilvie et al., 2007). Pelssers et al. (2013) showed positive effects of a 10-week walking intervention on physical fitness, PA and anxiety levels among healthy people aged 55 years and over. This intervention, called 'Every Step Counts!' (ESC), was embedded in local associations from a Flemish sociocultural organization for elderly. The intervention consisted of a personalized pedometer-based walking schedule, a weekly group walk and guidance by a walking coach. Because of the positive effects, the wide implementation (39 associations participated) and the social organization structure of this previous walking study (i.e., ESC), the same principles were applied to the walking intervention in the current study, called 'Join The Walk?' (JTW).

JTW was in essence similar to ESC but was attuned to the current target population (i.e., patients with a mental disorder). In fact, both ESC and JTW were in line with the basic principles from Self-Determination Theory (Deci & Ryan, 1985). Self-Determination Theory (SDT) has been suggested as a guiding framework for PA interventions in mental rehabilitation (Vancampfort & Faulkner, 2014). According to SDT, a climate that fosters the needs for autonomy, relatedness and competence is conducive to autonomous motivation, well-being, and behavioral persistence. Autonomy refers to a sense of volition and authorship. This need can be satisfied when people make meaningful choices. Relatedness refers to a feeling of connection to a social network. This need can be satisfied when people genuinely involve with others. Competence refers to a perception of control over the environment. This need can be satisfied when people envision attainable targets. Autonomous motivation has been shown to relate positively to walking and to moderate and vigorous PA in patients with a mental disorder (Vancampfort, Stubbs, Venigalla, & Probst, 2015c). In addition, a multicenter cross-sectional study in people with affective disorders indicated significant positive correlations between autonomous regulation in exercise and PA levels, walking amounts, and positive affect. Negative correlations were observed between autonomous regulation and negative affect. The opposite pattern of correlations was found between amotivation and these outcomes (Vancampfort et al., 2015a).

The aim of the current study was to investigate the short-term and follow-up effects of JTW. Based on the results from Pelssers and colleagues (Pelssers et al., 2013), we hypothesized that patients with a mental disorder who participated in a 10-week walking intervention similar to ESC, would improve on physical fitness, PA, levels of anxiety (lower feelings of anxiety) and levels of depression (lower feelings of depression), compared with patients in a control condition.

1. Method

1.1. Design

This was a non-randomized controlled trial. Participants were adult members of the Flemish federation for Sports and Recreation in Mental Health Care (viz., with a diagnosed mental disorder). A 2×3 repeated measures design was used. Condition (intervention/control) served as between-subject variable. Participants in the intervention condition (IC) took part in a 10-week intervention, whereas participants in the control condition (CC) did not. Participants in the CC were not recommended or prohibited any (physical) activities. Physical fitness, PA, anxiety and depression were assessed pre intervention (spring 2014), post intervention ($\pm$10 weeks after pre) and six months after the end of the intervention (i.e., follow-up).

In order not to overload participants with information, the baseline measurements (pre-test) in the IC were conducted in two parts, separated by a one-week interval (two-week in one association; see further). The separation was necessary because the intervention was explained immediately after the second part, which included the pedometer-based six-minute walk test (see further). Hence, the second baseline measurement formally marked the start of the intervention.

1.2. Recruitment

1.2.1. Associations

JTW was embedded in associations affiliated with the Flemish federation for Sports and Recreation in Mental Health Care (henceforth 'Federation'). These associations offer all kind of ergotherapeutic activities but they also receive support from the Federation in particular to support the provision of their PA and sports programs. The associations are attached to a mental health institution, such as a daycare center or a psychiatric center, and their members constitute patients who have been diagnosed with a mental disorder by a physician, most of them for a longer (chronic) period of time. The types (e.g., substance abuse, anxiety disorder, depression, psychotic disorder), durations and degrees of severity of the mental disorders vary. This diversity fosters a multidisciplinary sphere, which is currently lacking in the domain of PA interventions in mental rehabilitation (Vancampfort & Faulkner, 2014).

Associations were recruited in two steps. First, the Federation recruited associations for the IC, to ensure sufficient participation in the project. The Federation announced the project among all associations through diverse communication channels (e.g., newsletter, e-mail). The twelve associations that responded first were selected. In March 2014, a communal information session was