



Contents lists available at ScienceDirect

Schizophrenia Research

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

Psychosocial factors associated with physical activity behavior among patients with psychosis

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ARTICLE INFO

Article history:

Received 16 May 2017

Received in revised form 12 September 2017

Accepted 24 September 2017

Available online xxx

Keywords:

Behavior

Physical activity

Psychosis

ABSTRACT

Introduction: Although physical activity helps to improve functioning and reduce the symptoms of mental illness, physical inactivity remains common in the mental illness population. This study aims to explore the associations between theoretical constructs in relation to physical activity behavior based on psychological theories to examine reasons for physical inactivity in psychosis population.

Methods: One hundred and eighty one Chinese outpatients diagnosed with psychotic disorders were recruited for this cross-sectional study. Sociodemographic data and responses to questionnaires measuring self-efficacy, decisional balance, processes of change, and stages of change on physical activity habit were collected.

Results: Ninety three subjects (51.4%) had the intention to engage in regular physical activity within the next six months. Significant differences were found in self-efficacy, pros of decisional balance and processes of change across the stages of change. Moreover, overall classification accuracy was 60.8% across the stages of change.

Conclusions: This study supports self-efficacy, pros of decisional balance and processes of change as useful factors in understanding physical activity behavior among patients with psychosis. Future promotions of regular physical activity can focus on improving self-efficacy, emphasizing on the benefits of regular physical activity and facilitating cognitive and behavior strategies from processes of change.

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1. Introduction

There are many benefits associated with physical activity, including reduced risk of cardiovascular diseases, diabetes, obesity, hypertension, cancers, and early deaths (Centers for Disease Control and Prevention, 2011; Knochel et al., 2012). Exercise was found to improve physical, cardiometabolic (Firth et al., 2015), and cardiorespiratory fitness (Vancampfort et al., 2015a). However, according to the World Health Organization (2013), 31% of adults aged 15 or above globally were classified as insufficiently physically active. The situation is even worse among individuals with schizophrenia. A recent meta-analysis of 35 studies has found that individuals with schizophrenia engage in significantly less moderate and vigorous activity than the general population (Stubbs et al., 2016a). Studies have also demonstrated that patients

with schizophrenia not only have poor cardio-respiratory fitness, but also limited ability to be physically active (Koivukangas et al., 2010; Vancampfort et al., 2013a). It is also found that low level of physical activity in patients is associated with limitation in functional exercise capacity (Vancampfort et al., 2011). Patients' capacity in engaging in physical activity is reduced due to diminished intention and poor motivation from external control factors such as punishment and reward (Vancampfort et al., 2013b). Side-effects of medication also limit patients' motivation to engage in physical activity. Around 40% to 80% of patients would experience substantial weight gain and metabolic disturbance with second-generation antipsychotic medications (Archie et al., 2007; Casey et al., 2004; Lee et al., 2013; Lindamer et al., 2008). Thus, it is difficult for patients to maintain physical activity and the dropout rate in exercise programs can be high (Marshall and Biddle, 2001). All these reasons might contribute to the high level of sedentary behavior (Stubbs et al., 2016b) and low level of moderate and vigorous physical activity (Stubbs et al., 2016a) in patients with psychosis. This in turn might lead to a heightened risk for cardiovascular diseases (Correll et al., 2017), diabetes (Vancampfort et al., 2016), metabolic syndrome (Vancampfort et al., 2015b) and higher mortality rate (Correll et

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al., 2017). Besides, physical activity helps attenuate severity of symptoms in schizophrenia and depressive disorders (Rosenbaum et al., 2014) and also help improve cognitive functioning in individuals with psychotic disorders (Firth et al., 2017). It is also found that exercise helps promote better social functioning (Firth et al., 2015), as well as reduce symptoms of co-morbid disorders (Firth et al., 2015). These findings highlighted the benefits of physical activity to patients with psychosis and showed the importance of engaging patients in physical activity.

Self-determination is one of the critical determining factors for the action and maintenance stage of physical activity in schizophrenia patients (Vancampfort et al., 2013b). Therefore, identify the motivating factors or exercise goal in patients is of utmost importance in order to maximize exercise participation in people with severe mental illness (Firth et al., 2016a). Literatures have indicated that the use of theory-based interventions in motivating physical activity is more effective than atheoretical interventions (Kahn et al., 2002). Regardless of the success of theory-based interventions in promoting regular physical activity, no study has yet investigated the relationships between theoretical constructs in psychosis population. One of the theories that could be used to study and classify physical activity readiness in psychosis population is the stages of change theory. Individuals are classified into one of the five stages of change (precontemplation, contemplation, preparation, action and maintenance) according to their physical activity readiness and the time they spend in engaging in physical activities (Marshall and Biddle, 2001; Norcross et al., 2011). In which, precontemplation stage refers to the lack of intention or action to engage in physical activities; contemplation stage is the start of thinking to become physically active; preparation stage is when one begins to make few changes in behavior but not meeting the criteria for physical activity yet; action stage refers to when a qualified physical activity is done within the past 6 months, and lastly, maintenance stage is when one has maintained a genuine physical activity for six months or longer (Marshall and Biddle, 2001). While self-efficacy, decisional balance and processes of change are the constructs suggested by the behavior change model which are widely used in determining the change of physical activity behaviors. Self-efficacy is defined as the confidence level that accompanies the individual's engagement in or resistance to particular behaviors, and thus perceive as the confidence to overcome barriers for engaging in physical activity (Peipert and Ruggiero, 1998). Decisional balance is the movement of change after an individual weighs the pros and cons of the behaviors (Peipert and Ruggiero, 1998). Finally, processes of change, which include experiential (consciousness raising, dramatic relief, environmental reevaluation, self-reevaluation, social liberation) and behavioral (reinforcement management, helping relationships, self-liberation, counterconditioning, stimulus control) factors, is defined as the different strategies that an individual adopts to modify the change of their behaviors across the stages of change (Marshall and Biddle, 2001). It is hypothesized that, changes in these theoretical constructs can facilitate the change of physical activity, which could be tracked by observing the five stages of change in behavior. Although Goryzynski and Faulkner (2010) found self-efficacy and pros of decisional balance differed significantly across stages in serious mental illness population, processes of change were not assessed in their study (Goryzynski et al., 2010).

Hence, this study aims to explore the associations between the three theoretical constructs - self-efficacy, decisional balance and processes of change across the five stages of change (precontemplation, contemplation, preparation, action and maintenance) in psychosis population. We hypothesized that, with successive stages of change, patients would have an increase in self-efficacy, perceive more benefits than costs to physical activity, and have an increase in use of behavioral processes with a decrease in use of experiential processes. Findings of this study will contribute towards the development of future interventions in promoting regular physical activity in the psychosis population.

2. Methodology

2.1. Design and procedures

A cross sectional design was used in this study. Chinese patients who were attending the outpatient clinic at Queen Mary Hospital in Hong Kong, and were diagnosed with Schizophrenia and other Psychotic Disorders according to DSM-IV were recruited. Diagnoses were determined by psychiatrists using the Structured Clinical Interview for DSM-IV. The inclusion criteria were: (1) aged between 18 and 64 years, (2) able to understand and comply with the requirements of the study, (3) able to understand and communicate in Cantonese, and (4) willing to give written informed consent. The exclusion criteria were: (1) diagnosed with moderate to severe learning disability, and (2) with unstable psychotic symptoms. Patients were approached during their medical appointments in outpatient clinics, data were collected by completing the questionnaires at the clinic upon written consent to the participation of the study. This study was approved by the local ethical review board with written informed consent by all participants.

2.2. Instruments

The assessments include questionnaires for collecting demographic information and measurements for physical activity readiness (stages of change) (Marcus et al., 1992a) and physical activity behaviors (self-efficacy, decisional balance and processes of change) (Marcus et al., 1992b; Nigg et al., 1998; Nigg et al., 1999). Physical activity readiness was measured by the stages of change questionnaire. The stages of change questionnaire used a self-report, 4-item dichotomous scale to classify patients into different stages of change (Marcus et al., 1992a). Patients would need to answer four yes or no questions on whether they were actively participating in physical activity at the time, planning to engage in more physical activities in the coming six months, already had regular physical activity, or already had regular physical activities for the last six months. With physical activity defined as engaging in moderate or vigorous intensity of physical activity for 30 min on 5 days or more per week. The self-efficacy questionnaire is a self-report, 18-item, 5-point Likert scale (Marcus et al., 1992b). Patients would need to answer their levels of determination in doing physical activities under various external interferences, with higher scores indicating greater confidence in doing physical activities. The questionnaire for decisional balance is a self-report, 10-item, 5-point Likert scale (Nigg et al., 1998). It measures how important each given advantages and disadvantages of physical activity is to patients in deciding whether to engage in physical activities or not, with higher scores indicating greater importance of the variable. Processes of change questionnaire is a self-report, 30-item, 5-point Likert scale (Nigg et al., 1999), measuring the frequency of given events in affecting patients' exercise habit. Higher scores indicate a higher frequency for the given event.

The English versions of the self-efficacy, decisional balance, and processes of change questionnaires were back translated into the Chinese version by four bilingual researchers and research assistants. The semantic consistency between the English and Chinese versions of the questionnaires was checked, and amendments were made where necessary. In this study, the Cronbach's alphas for self-efficacy, decisional balance, and processes of change items were 0.89, 0.76, and 0.93 respectively.

2.3. Data analysis

Statistical Package for Social Sciences (SPSS) version 20.0 was used for data analysis. Demographic information and the stages of change questionnaire were described in percentage, frequency, mean and standard deviation. One-way ANOVA was carried out to analyze the differences in self-efficacy, decisional balance, and processes of change at different stages of change. Turkey's post-hoc test was performed with

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