Psychosocial factors associated with physical activity behavior among patients with psychosis


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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 (Stubb 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 (Stubb et al., 2016b) and low level of moderate and vigorous physical activity (Stubb et al., 2016a) in patients with psychosis. This in turns 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
al., 2017). Besides, physical activity helps attenuate severity of symp-
toms 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 re-
duce symptoms of co-morbid disorders (Firth et al., 2015). These find-
ings 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 pa-
tients (Vancampfort et al., 2013b). Therefore, identifying 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). Literature has 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 ac-
tivity, no study has yet investigated the relationships between theoret-
ical constructs in psychosis population. One of the theories that could be
used to study and classify physical activity readiness in psychosis popu-
lation is the stages of change theory. Individuals are classified into one of
the five stages of change (precontemplation, contemplation, prepara-
tion, 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 en-
gage 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 (Peiper and Ruggiero, 1998).
Decisional balance is the movement of change after an individual
weights the pros and cons of the behaviors (Peiper and Ruggiero,
1998). Finally, processes of change, which include experiential
(consciousness raising, dramatic relief, environmental reevaluation,
self-reevaluation, social liberation) and behavioral (reinforcement man-
agement, 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 Gorczynski 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 (Gorzynski et al., 2010).

Hence, this study aims to explore the associations between the
three theoretical constructs - self-efficacy, decisional balance and pro-
cesses 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 Dis-
orders 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 psy-
chotic symptoms. Patients were approached during their medical ap-
pointments in outpatient clinics, data were collected by completing the
questionnaires at the clinic upon written consent to the participa-
tion 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 disadvan-
tages of physical activity is to patients in deciding whether to engage in
physical activities or not, with higher scores indicating greater impor-
tance of the variable. Processes of change questionnaire is a self-report,
30-item, 5-point Likert scale (Nigg et al., 1999), measuring the frequen-
cy of given events in affecting patients’ exercise habit. Higher scores indi-
cate a higher frequency for the given event.

The English versions of the self-efficacy, decisional balance, and pro-
cesses of change questionnaires were back translated into the Chinese
version by four bilingual researchers and research assistants. The se-
matic consistency between the English and Chinese versions of the
questionnaires was checked, and amendments were made where nec-
essary. 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 stan-
dard deviation. One-way ANOVA was carried out to analyze the differ-
ces between the English and Chinese versions of the
questionnaires. The Cronbach’s alphas for the questionnaire at the clinic upon written consent to the participa-
tion of the study. This study was approved by the local ethical review
board with written informed consent by all participants.
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