



Motives for physical activity in the adoption and maintenance of physical activity in middle-aged and old age outpatients with a mental disorder: A cross-sectional study from a low-income country



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ABSTRACT

Within the trans-theoretical model (stages of change) and self-determination theory frameworks, we investigated motives for physical activity adoption and maintenance in middle-aged and old age people with a mental disorder from a low-income setting. Ninety Ugandan outpatients completed the Behavioral Regulation in Exercise Questionnaire-3 (BREQ-3) to assess exercise motives and the Patient-centred Assessment and Counselling for Exercise (PACE) to determine stage of change. The relationship between motives for physical activity and stage of change was investigated using MANOVA with post-hoc Scheffe tests. Higher amotivation levels were observed in the pre-action compared with action and maintenance stages, while except for external regulation, all regulation scores were significantly lower in the pre-action compared with action and maintenance stages. There were no significant differences in levels of motivational types between the action and maintenance stage. The study provides a platform for future research to investigate relationships between motivational factors and physical and mental health outcomes within physical activity interventions for middle-aged and old age people with a mental disorder.

1. Introduction

Despite the fact that many low- and middle-income countries (LMICs) have a National mental health policy framework, there are clear gaps in mental health service delivery as less than one percent of the health budget in LMICs is spent on mental health (Mugisha, 2016). As a result, mental health services are poorly resourced in this part of the world and less than 10% of patients receives adequate care (Ssebunnya et al., 2012). Lack of scientific evidence, lack of access to mental health care opportunities, high costs, poverty, and stigma are considered to be major constraints to the rehabilitation and recovery of people with mental disorders (Ssebunnya et al., 2012). But even the existing care models have serious shortcomings as emphasis in health service delivery in LMICs is still heavily based on the biomedical instead of the biopsychosocial model with a reliance mainly on expensive pharmacotherapy (Mugisha et al., 2016). Psychotropic medication is however seldom available and patients mostly cannot afford it, especially in more rural areas and among older people (Mugisha et al.,

2016). Moreover, with regards to the mental health care of older people, in most LMICs no attention is given to their specific needs (Mugisha et al., 2016).

Physical activity has important mental, social and physical health benefits in middle-aged and old age people with a mental illness (Schuch et al., 2016). It is therefore important to maximize the health benefits and return on investment of physical activity programs, and to improve their sustainability, recruitment and retention rates. To achieve this, we first need to know which middle-aged and old age patients are (and are not) physically active, and what are their specific motives and barriers. The current literature indicates that barriers related to lower physical activity in people with mental illness include functional impairments, physical co-morbidity, distress associated with the disorder, increased smoking rates, the presence of anxiety or depression and a lower self-efficacy (Stubbs et al., 2014; Vancampfort et al., 2013a, 2015a,b, 2012).

In order to understand and address potential motivational deficits, there is a need for theoretically based research on the motivational

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processes linked to the adoption and maintenance of physical activity behaviours. One of the most commonly adopted models of behaviour change which might be applied for motivating middle-aged and old age people with a mental disorder towards an active lifestyle is the trans-theoretical model (TTM) (Prochaska and DiClemente, 1992). The model has been successfully utilised to describe the different phases that young people with mental health problems pass through in the acquisition and maintenance of physical activity behaviours (Vancampfort et al., 2014, 2015b,c). The TTM provides a framework for categorising a person's readiness to change their behaviour and includes five stages, i.e. the pre-contemplation, contemplation, preparation, action and maintenance stage.

Although the TTM has been used successfully to explain the process from acquisition to maintenance of physical activity, it has some limitations. For instance, it is not able to explain why one adopts an active lifestyle or remains sedentary, nor is it able to identify the mechanisms that underlie the maintenance of physical activity. The self-determination theory (SDT) (Deci and Ryan, 2000) is a motivational theory that provides an insight into such motives. The theory proposes that motivation is multidimensional and resides along a continuum from amotivation to intrinsic motivation. Amotivation, represents a general lack of motivation to become more physically active due to discouragement. External regulation refers to being physically active to avoid criticism or to obtain external appreciation. Introjected regulation refers to the imposition of pressures onto one's own functioning, for instance, by via feelings of guilt. More autonomous forms include identified regulation, which involves foreseeing the personal importance of physical activity, and integrated regulation, which implies that physical activity is brought in harmony with other prevailing life values, such that being active becomes prioritised within one's lifestyle. Finally, intrinsic motivation involves engaging in physical activity because one finds being active stimulating or enjoyable by itself.

To date, it is unclear whether the SDT can explain the initiation and maintenance of physical activity participation in older people with a mental disorder. Examining SDT constructs in this population is of high clinical relevance, in particular in low resource settings where cost-effective lifestyle interventions can play a major role. In 2014 a call was made already for theoretically-driven research that examines how to reliably assist patients with mental health problems to adopt and maintain physical activity in the face of significant motivational and cognitive deficits (Vancampfort and Faulkner, 2014). Although a longitudinal design would be ideal to answer this question, the maintained engagement in physical activity can be indirectly captured through the assessment of the stages of change. Apart from studying the initiation and maintenance of physical activity behaviour, it is also interesting to explore whether some patients start to formulate intentions to engage in physical activity or do not consider doing so at all. The initial stages of change (pre-contemplation and contemplation) of the TTM precisely captures such emerging readiness to change in the future. For these reasons, it is useful to examine how SDT-based reasons for physical activity relate to stages of change in TTM.

Secondly, autonomous forms of motivation and stages of change are thought to be universal (Deci and Ryan, 2000), but studies on motives for physical activity participation in low-resource settings in LMICs are scarce. It is of interest to explore motives for physical activity participation in a non-Western setting as cultural norms in such settings often dictate that health promotion behaviours, such as engaging in physical activity, are viewed as Western behaviours (Oyserman et al., 2007).

To the best of our knowledge, the current study is the first to explore personal motives for being physically active in middle-aged and old age people with mental illness in general and in low-resource mental health setting in Sub-Saharan Africa in particular. Thus, given the aforementioned gaps within the literature, we aimed to investigate the motives for being physically active in this population in Uganda. More in detail, we explore differences in motives across the stages of change. It was hypothesised that more autonomous forms of motivation (i.e.

identified, integrated and intrinsic regulations) would be prevalent in more advanced stages of change (i.e. preparation, action and maintenance). In contrast, more controlling forms of motivation (i.e. external and introjected regulations) and specifically amotivation would be enhanced in the least advanced stages of change (i.e. pre-contemplation and contemplation). A secondary aim was to investigate whether motivational factors were associated with psychiatric symptoms. It was hypothesised that higher levels of depression, anxiety and somatization were associated with higher levels of amotivation and lower levels of other motivational regulations.

2. Methods

2.1. Participants and procedure

In a 9-month period all consecutive middle-aged ($50 < 65$ years) and old-age ($65 \leq$ years) outpatients who had any clinical DSM 5 diagnosis (American Psychiatric Association, 2013) as diagnosed by the treating psychiatrist of the Butabika National Referral Hospital, Kampala, Uganda, were invited to participate. The outpatient treatment consists mainly of pharmacotherapy. Outpatients were invited when the medication was stable for at least 3 weeks. All questionnaires were interviewer-administered in English or Luganda when appropriate. The interviewer was a trained psychologist. The study procedure was approved by the ethical committee of Mengo Hospital and the Butabika Hospital Research Committee. All participants gave their written informed consent.

2.2. Behavioral regulation in exercise questionnaire - 3 (BREQ-3)

The BREQ-3 (Markland and Tobin, 2004; Wilson et al., 2006) considers an individual's motivation towards exercise. We adapted the BREQ-3 by replacing the term "exercise" with the broader term "physical activity". This was undertaken for two reasons, firstly, physical activity recommendations refer to all physical activities and not to exercise which is only one component of physical activity (Caspersen et al., 1985). Secondly, a similar change was made and successfully applied in previous research in people with mental illness (Vancampfort et al., 2013b). The BREQ-3 comprises 24 items relating to the six motivation types from the SDT (i.e. amotivation, external regulation, introjected regulation, identified regulation, integrated regulation and intrinsic motivation). Each item is measured on a five-point Likert-scale, from 0 ('Not true for me') to 4 ('Very true for me'). The mean of the six retrieved subscales is calculated on a five-point scale to score the extent of each motivation type separately. The Cronbach's alpha ranged from 0.66 for amotivation to 0.75 for integrated regulation.

2.3. Stage of readiness for change

Stages of change as derived from the trans-theoretical model (Prochaska and DiClemente, 1992) were assessed using a modified version of the stage of change questionnaire from the Patient-centred Assessment and Counselling for Exercise (PACE) questionnaire (Long et al., 1996). The algorithm used was a single item followed by four questions. In the present study, physical activity was defined as moderate intensity activity for 30 min or more on at least five days of the week (for example, physical activities that take moderate physical effort and make you breathe somewhat harder than normal), and the four questions were used to determine the stage of change for physical activity. Participants had to answer either 'yes' or 'no' to each of the following questions: (1) Do you currently engage in physical activity? (2) Do you intend to engage in regular physical activity in the next 6 months? (3) Do you intend to engage in regular physical activity in the next 30 days? (4) Have you been regularly physically active for the past 6 months? If they answered 'no' to questions 1 and 2, they were classified as being in pre-contemplation. If they answered 'no' to

questions 1 and 3, but 'yes' to question 2, they were considered to be in contemplation. If they answered 'no' to question 1, but 'yes' to question 3, they were classified as being in preparation. If they answered 'yes' to question 1, but 'no' to question 4, they were considered in action and, if they answered 'yes' to questions 1 and 4, they were considered to be in maintenance. In this study those in the (pre-) contemplation and preparation stages were labelled as being in the pre-action stage.

2.4. Brief symptoms inventory -18

Symptoms were assessed with the Luganda (or English) version of the BSI-18 (Derogatis, 2001). The BSI-18 (Derogatis, 2001) is a self-reported screening inventory designed to assess participants' level of psychological distress on three dimensions: somatization, depression, and anxiety. The 18 items are divided equally across the three dimensions and were presented with the standard instructions asking participants to rate how much they have been "distressed or bothered" in the past 7 days, including today, by the given symptom, using a 5-point Likert scale ranging from 0 (**not at all**) to 4 (**extremely**). Each item contributes to only one subscale, which is scored by summing the scores on each of the six subscale items. The three raw subscale scores range from 0 to 24. The questionnaire was interviewer-administered.

2.5. Cardio-metabolic risks

The presence of four cardio-metabolic risk factors: (1) abdominal obesity, (2) hypertension, (3) smoking, and (4) a high body mass index ($BMI \geq 25$) were assessed. Waist circumference (WC) was measured to nearest 1 cm at the level of the umbilicus and at the end of expiration with the subject upright. Based on criteria for Sub-Saharan Africans a waist circumference of >90 cm is considered a risk factor for men (Crowther and Norris, 2012; Kalk et al., 2011). Hypertension was diagnosed when the systolic pressure was ≥ 140 mmHg and/or diastolic pressure was ≥ 90 mmHg (Chobanian et al., 2003) or when taking anti-hypertensive medication. Blood pressure measurements were taken on the left arm with the participant in the sitting position using a calibrated electronic blood pressure device. Three systolic and diastolic blood pressure measurements were taken at least five minutes apart. The average of the last two blood pressure readings was used in this analysis. Smoking status was self-reported and the mean number of cigarettes smoked per day recorded. For calculating the BMI (kg/m^2), body weight was measured in light clothing to the nearest 0.1 kg using a SECA beam balance scale, and height to the nearest 0.1 cm using a wall-mounted stadiometer.

2.6. Statistical analyses

Data were assessed for normality using the Shapiro-Wilk test and found to be normally distributed. Descriptive statistics are presented as mean and standard deviation (SD). A multivariate analysis of variance was used to test for significant differences in BREQ-3 scores (i.e. amotivation, external regulation, introjected regulation, identified

regulation, integrated regulation and intrinsic motivation) across the 3 stages of change (i.e. pre-action, action and maintenance stage). Where significant main effects were demonstrated, we followed up with comparisons of differences across groups using Sheffé post-hoc tests. Significance level was set at $p < 0.05$. Due to the exploratory nature of this study we did not correct for multiple testing. SPSS 25.0 was used for the data analyses (SPSS Inc, Chicago, IL).

3. Results

3.1. Participants

A total of 100 consecutive outpatients were invited to take part in the study. Three patients were excluded due to somatic contra-indications which would prevent them from being physically active as usual while also seven female patients declined to participate. None of the patients who agreed to participate dropped out. There were no missing data. In total, 90 participants of which 17 female patients were included. The mean age was 55.5 ± 4.5 years. Diagnoses were alcohol use disorder ($n = 31$), psychosis ($n = 20$), schizophrenia ($n = 18$), major depressive disorder ($n = 8$), bipolar disorder ($n = 7$) and mild dementia ($n = 6$). Fifty-five patients were treated with antipsychotics. The mean Chlorpromazine equivalent dose was 249.0 ± 111.2 mg/day. The mean BSI-18 depression score was 10.3 ± 3.6 , the mean BSI-18 anxiety score 8.5 ± 3.5 and the mean BSI-18 somatization score 9.1 ± 3.1 . The mean was BMI 22.0 ± 2.2 and the mean waist circumference 79.6 ± 9.4 cm. Thirteen patients (14.4%) had a BMI greater than 25, eight (8.9%) had a waist circumference which was above 90 cm, 13 patients (14.4%) had a blood pressure consistent with hypertension and 9 patients (10%) smoked a mean of 9 ± 9 cigarettes per day. For 19 patients (21.1%) a chronic condition was reported in the medical file. The most reported condition was hypertension ($n = 12$), followed by diabetes ($n = 3$), cardiovascular disease ($n = 2$), asthma ($n = 1$), and HIV ($n = 1$).

3.2. Differences in BREQ-3 scores between stages of change

Differences in BREQ-3 scores between the stages of change are presented in Table 1. The amotivation score was significantly higher in the pre-action stages compared with the levels in the action and maintenance stages. Except for external regulation, all regulation scores were significantly lower in the pre-action stages compared with the levels in the action and maintenance stages. There were no significant differences in levels of motivational types between the action and maintenance stage.

3.3. Associations between BREQ-3 and BSI-18 scores

A higher BSI-18 somatization score was significantly associated with a higher BREQ-3 amotivation score and significantly associated with lower BREQ-3 integrated and intrinsic regulation scores (see Table 2). No other significant associations were found.

Table 1

Means and standard deviations and differences in the BREQ-3 scores by stage of change in middle-aged and old age people with mental illness ($n = 90$).

Motivational type	Pre-action ($n = 65$)		Action ($n = 5$)		Maintenance ($n = 20$)		F-value	P-value
	M	SD	M	SD	M	SD		
Amotivation	1.5 ^{a,b}	0.7	1.1 ^a	0.3	1.0 ^b	0.2	4.9	0.01*
External regulation	1.3	0.5	1.0	0.3	1.1	0.1	1.7	0.20
Introjected regulation	1.3 ^{a,b}	0.7	1.8 ^a	0.8	2.2 ^b	1.1	9.0	<0.001*
Identified regulation	2.2 ^{a,b}	0.8	2.9 ^a	0.3	3.0 ^b	0.6	9.9	<0.001*
Integrated regulation	1.4 ^{a,b}	0.7	2.5 ^a	0.9	2.9 ^b	1.0	33.0	<0.001*
Intrinsic regulation	2.0 ^{a,b}	1.0	3.0 ^a	0.7	3.4 ^b	0.8	19.9	<0.001*

MANOVA (*model significant at $p < 0.05$) with post hoc Scheffe when indicated (significance set here at $p < 0.05$), M = mean, SD = standard deviation, a = pre-action versus action, b = pre-action versus maintenance. BREQ = Behavioral regulation in exercise questionnaire.

Table 2Pearson correlation coefficients between BSI-18 and BREQ-3 scores in middle-aged and old age people with mental illness ($n = 90$).

	BSI-18 Depression		BSI-18 Anxiety		BSI-18 Somatization	
	r	P	r	P	r	P
BREQ-3 Amotivation	0.13	0.21	0.13	0.23	0.35	0.001*
BREQ-3 External regulation	0.13	0.24	0.04	0.70	0.16	0.14
BREQ-3 Introjected regulation	-0.10	0.32	0.00	0.96	-0.15	0.17
BREQ-3 Identified regulation	-0.11	0.31	0.17	0.10	-0.06	0.59
BREQ-3 Integrated regulation	-0.06	0.58	0.05	0.66	-0.29	0.006*
BREQ-3 Intrinsic regulation	-0.16	0.13	0.06	0.57	-0.28	0.008*

BREQ = Behavioral regulation in exercise questionnaire, BSI = Brief Symptoms Inventory, * significant when $P < 0.05$.

4. Discussion

4.1. General findings

To the best of our knowledge the current study is the first to investigate the relevance of SDT (Deci and Ryan, 2000) in clarifying physical activity behavior in people aged 50 and older with a mental illness. We demonstrate that in this population lower levels of amotivation are observed in the action and maintenance versus pre-action TTM stage. We also demonstrate that higher levels of introjected (for example, feelings of guilt, self-criticism, or contingent self-worth), identified (i.e., personally important), integrated (i.e. in harmony with other life values) and intrinsic (i.e. enjoyment, interest, challenge) motivation are observed in the action and maintenance versus pre-action TTM stage.

Our data show that also at a later age identifying oneself with the values of physical activity and bringing these values into congruence with one's other values and needs in life is essential for adopting and maintaining an active lifestyle in those experiencing mental problems. Of interest, and in contrast with previous studies in people with mental health problems in Western countries (Vancampfort et al., 2015c; Vancampfort et al., 2018), there were no differences in motivational regulations between the action and maintenance stage of change. More research is needed to explore this in more detail. It might be that the limited number of people that could be allocated to the action stage ($n = 5$) is a reason.

A second important finding was that higher somatization scores were associated with higher levels of amotivation and lower levels of autonomous motivation. The underlying reason might be that patients with mental illness exhibit greater sensitivity to autonomic symptoms such as an increased heart rate, faster breathing and sweating. These symptoms might occur in sedentary patients even at light intensity physical activity. Patients likely want to avoid situations that potentially trigger the above-mentioned symptoms and therefore are less motivated to be physically active (Martinsen et al., 1998). Equally, fear for somatic problems while being physically active might result in patients with somatization symptoms to stop the activity while becoming less autonomously motivated to perform the activity again. In essence, our data indicate that health care professionals should consider somatization symptoms when motivating older people with mental illness.

A third important finding is that 65 of the 90 patients were in the pre-action stages of change indicating that they were not complying with the international physical activity recommendation of being active at least at moderate intensity for 30 min or more for at least five days of the week (World Health Organization, 2010). Therefore, the current data demonstrate that additional efforts are urgently needed to motivate this vulnerable group to become more physically active.

4.2. Practical implications

While the validity and usefulness of the SDT taxonomy has been confirmed in Western mental health care settings (Vancampfort et al., 2015b,c, 2014), our study in a LMIC suggest its validity in LMIC

contexts as well. However, more research is needed to explore whether the SDT taxonomy can be applied in different non-Western mental health care settings as well. Data also show that the facilitation of autonomous forms of physical activity motivation appears important for the adoption of an active lifestyle in older people with mental illness. It has been argued before (Deci and Ryan, 2000) that the enhancement of autonomy represents a non-specific therapeutic factor, which is critical across clinical schools and clinical populations. Previous research has shown that in order to facilitate introjected, identified, integrated and intrinsic motivation, psychological needs for autonomy (i.e., experiencing a sense of psychological freedom when engaging in physical activity), competence (i.e., feeling effective to attain desired outcomes) and relatedness (i.e., being socially connected) need to be nurtured across these stages (Teixeira et al., 2012). In clinical practice this can be done by offering clear physical activity choices, supporting own initiative, avoiding the use of external rewards, using autonomy supportive language (for example "could" and "choose" rather than "should" and "have to"), constructive feedback, showing enthusiasm and interest and offering both individual support and group-based physical activity sessions (Vansteenkiste and Sheldon, 2006). The way health care professionals, caregivers or others attend to the psychological needs might depend on the patients' stage of change, with some supportive components (for example; acknowledging barriers, offering choices, providing a rationale for becoming more physically active) being more critical in the pre-action stage.

4.3. Limitations and future research

Caution should be exercised in generalising from the present findings given the cross-sectional nature of this research. Longitudinal and intervention studies should be designed to identify the causal pathways between the different constructs. Grounded in SDT, such intervention studies should strive to foster perceptions of choice, competence, and enjoyment for physical activity. A second limitation is the limited number of people in the later stages of change and the limited number of female participants, which prevents us from making any generalizations. Third, the current study contained no data on socio-economic and educational status and could therefore not determine any relationship between motivational regulations, stages of physical activity participation and socio-economic and educational status. Fourth, due to the lack of control data we were not able to compare the current data with any references. Nevertheless, allowing for these caveats our study is the first to investigate the role of motivation regarding physical activity participation in middle-aged and old age people with a mental illness in a low-income country. Our study meets previous calls to better understand the motivational processes that may underlie the adoption of physical activity in this population.

In conclusion, the current findings suggest that introjected, identified, integrated and intrinsic motivation may play an important role in enabling older people with a mental illness to engage in regular physical activity. Moreover, the study provides a platform for future research to investigate the relationships between motivational factors and physical and mental health outcomes within physical activity

interventions. Future research should for example explore whether increasing autonomous motivation via facilitating autonomy, competence and social relatedness results in higher adherence in and lower dropout from physical activity interventions.

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Declaration of Competing Interest

None.

Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.psychres.2019.112620.

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