

Research Article

Examining the Construct Validity of the Transtheoretical Model to Structure Workplace Physical Activity Interventions to Improve Mental Health in Academic StaffPaul F. Gorczynski^{1*}, Denise Hill¹, Shanaya Rathod²¹ University of Portsmouth, Department of Sport and Exercise Science, Spinnaker Building, Cambridge Road, Portsmouth, Hampshire, UK² Southern Health NHS Foundation Trust, Antelope House, Brintons Terrace, Southampton, Hampshire,

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Abstract

In the UK, many academic staff are not sufficiently physically active and experience high levels of poor mental health. Designing theoretical workplace physical activity interventions may help this population become active and improve their mental health. This study examined the construct validity of the Transtheoretical Model (TTM) in academic staff to design physical activity interventions for mental health purposes. One-hundred fifty-eight academic staff employed in a teaching or research capacity completed online surveys on their current stage of change of physical activity, self-efficacy, perceived benefits and barriers of being active, distress, and wellbeing. Analyses of variance compared stages of physical activity against psychological and mental health variables. Overall, most individuals were in the action and maintenance stages of the TTM. Self-efficacy and benefits increased, while barriers of physical activity decreased with each successive stage, indicating that the mediators of physical activity changed in accordance with the TTM. Additionally, distress decreased and wellbeing increased significantly with each successive stage, indicating better mental health amongst active individuals. This study supports the use of the TTM to structure workplace physical activity interventions for mental health purposes for academic staff. Strategies should be employed to strengthen self-efficacy in those individuals thinking about or intending to become active.

Keywords: Transtheoretical Model; Physical Activity; Mental Health, Academic Staff

Introduction

Physical activity is associated with physical, social, and mental health benefits [1,2], yet 42% of academic staff in the United Kingdom are not sufficiently active to achieve health gains [3][2]. Given high rates of stress and poor mental health amongst academic staff [4][6], workplace physical activity interventions may help this population become active and improve their mental health by addressing anxiety and depressive symptoms [5][10].

Research shows that physical activity interventions for academic staff are largely atheoretical [6][3]. The Transtheoretical Model (TTM) [7] [9] is a stage-wise model that assesses an individual's readiness to change a behaviour. Based on their level of readiness, individuals are put into one of five

stages: precontemplation (no interest in behaviour change), contemplation (thinking of behaviour change in the next 6 months), preparation (intending to change behaviour in the next month), active (engaging in behaviour change), and maintenance (engaged in behaviour change for more than 6 months). The TTM has behavioural and cognitive strategies to help individuals progress through stages by strengthening their self-efficacy, and maximizing and minimizing their perceptions of benefits and barriers to behaviour change, respectively.

The TTM has been shown to be an effective model of physical activity behavior change [8,9,10] and research has shown that stage wise increases in physical activity are associated with improved wellbeing amongst active academics [3]. Yet, no research has examined whether key mediators of physi-

cal activity behavior (i.e., self-efficacy, perceived benefits and barriers) differ across stages of readiness in this population. As a result, the construct validity of the TTM for physical activity intervention design for mental health in this population has not been explored.

The purpose of this study was to examine the construct validity of the TTM in academic staff, in order to determine whether self-efficacy and perceived benefits would increase, and perceived barriers would decrease, with successive stages of the TTM. A secondary purpose was to explore distress and wellbeing in relation to the stages of the TTM and physical activity readiness within this population.

Methods

Participants and Procedure

After ethical approval from the Science Faculty Ethics Committee at the University of Portsmouth, 1490 academic staff employed in a teaching or research capacity at a university in the south of England were sent two emails (initial and follow-up) to their work email addresses to participate in an online survey. In total, 158 individuals responded to the emails and participated in the study.

Survey

Participants were asked to provide age, gender, sexuality, ethnicity, academic position, and contract length (temporary, permanent). Stage of physical activity was assessed using the stage of change question from the Patient-Centered Assessment and Counseling for Exercise (PACE) questionnaire [11]. Questions from the PACE aligned with the stages of the TTM [7] and provided a proxy measure for physical activity, which defined as “moderate activity, an intensity which makes you breathe somewhat harder than normal, for 30 minutes on most days of the week” [11]. Accordingly, participants were asked to select the stage that represented their stage of physical activity. Given theoretical similarities, the stages were then collapsed for the analysis to form three distinct stages: precontemplation and contemplation; preparation; and action and maintenance [12].

Physical activity self-efficacy and perceived benefits and barriers of physical activity were measured using questions from the PACE survey [11]. Self-efficacy and benefits and barriers were both rated on a 5-point Likert scale with higher values indicating greater confidence and importance, respectively. The self-efficacy, benefits, and barriers measures were reliable with Cronbach alphas of .81, .68, and .73, respectively.

The 10-item Kessler Psychological Distress Scale 10 (K10) [13] assessed distress. Participants indicated their level of agreement on a 5-point Likert scale, where higher scores indicated greater distress. The K10 was reliable with a Cronbach alpha of .89.

The 14-item Warwick-Edinburgh Mental Well-being Scale (WEMWBS) [2] measured wellbeing. Participants indicated how often they felt aspects of positive mental health on a 5-point Likert scale, where higher scores indicated greater wellbeing. The WEMWBS was reliable with a Cronbach Alpha of .95.

Analysis

Analyses of variance compared stages of physical activity against self-efficacy, benefits and barriers of physical activity, distress, and wellbeing. It was hypothesized that changes would be detected at a $p < .05$ level across the stages of the TTM.

Results

Demographic Data

The sample consisted of 71 women, 86 men, and one transgender individual. Age ranged from 24 to 69 years with a mean of 45.4 years ($SD = 10.5$). Most participants self identified as heterosexual (90.1%), white (94.9%), employed as senior lecturers (45.6%) or principal lecturers (20.1%), and on permanent contracts (91.8%).

Stages of Change

A total of 99 individuals indicated they were in the active and maintenance stages (62.7%), while 48 (30.4%) were in the preparation stage, and 11 (7.0%) were in the precontemplation and contemplation stages.

Self-efficacy and Benefits / Barriers to Physical Activity

Participants indicated they were most confident about being active when sad or stressed ($M = 4.0$, $SD = 1.2$) and least confident about being active when they had social obligations ($M = 3.0$, $SD = 1.2$). The mean self-efficacy score was 3.5 ($SD = .9$), ranging from 1.7 to 5.0.

Participants perceived the greatest benefit of physical activity was staying fit ($M = 4.6$, $SD = .7$), while the biggest barrier was having to learn too much about being active ($M = 1.5$, $SD = .8$). The mean perceived benefits score was 4.2 ($SD = .5$), ranging from 2.2 to 5.0. The mean perceived barriers score was 2.1 ($SD = .7$), ranging from 1.0 to 4.2.

Distress and Wellbeing

In total, 43.0% of participants indicated at least a mild mental disorder. Distress ranged from 10 to 41, with a mean score of 19.5 ($SD = 6.8$). Wellbeing ranged from 16 to 70, with a mean score of 48.0 ($SD = 10.1$).

Comparing Stages of Change and Self-efficacy, Benefits, Barriers, Distress, and Wellbeing

A significant increase in self-efficacy occurred between the three stages of change, $F(2,154) = 66.0$, $p = .000$, with self-efficacy increasing from $M = 2.4$ ($SD = .9$) in precontemplation and contemplation to $M = 4.0$ ($SD = .7$) in action and maintenance. For perceived benefits, no significant differences were seen between the three stages, $F(2, 150) = 2.0$, $p = .139$. For perceived barriers, a significant difference was found between the three stages, $F(2, 148) = 44.5$, $p = .000$, with perceived barriers decreasing from $M = 3.0$ ($SD = .8$) in precontemplation and contemplation to $M = 1.7$ ($SD = .5$) in action and maintenance. See Figure 1.

Regarding distress, significant differences were found between all three stages, $F(2, 149) = 8.798$, $p = .000$, with distress decreasing from $M = 24.0$ ($SD = 6.5$) in precontemplation and contemplation to $M = 17.9$ ($SD = 6.3$) in action and maintenance. For wellbeing, a significant difference was found between all three stages, $F(2, 150) = 11.552$, $p = .000$, with wellbeing increasing from $M = 40.6$ ($SD = 12.5$) in precontemplation and contemplation to $M = 50.8$ ($SD = 9.2$) in action and maintenance. See Figure 2.

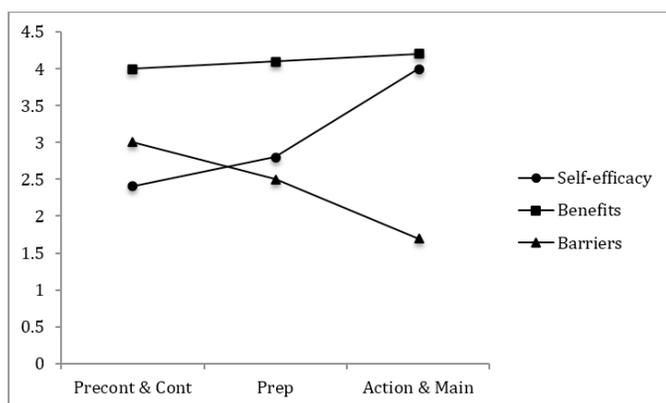


Figure 1: Mean scores of self-efficacy, benefits, and barriers across stages of the TTM.

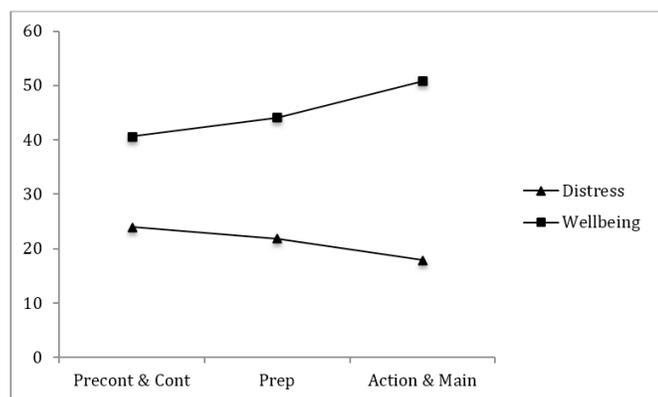


Figure 2: Mean scores of distress and wellbeing across stages of the TTM.

Discussion

The results of this study support the use of the TTM to structure physical activity interventions for mental health purposes among academic staff. Specifically, mediators of physical activity changed in accordance with the TTM. Additionally, distress decreased and wellbeing increased significantly with each successive stage, indicating better mental health amongst active individuals. Regarding the use of the TTM to structure physical activity interventions, findings mirror previous studies [8,12]. Results for wellbeing are also similar to Cooper and Barton [3], indicating consistency across different academic institutions. Results for distress indicated that academic staff were nearly 2.5 times more likely to self-report mental health problems than the national average [14].

This study offers several recommendations to structure workplace physical activity interventions for improving mental health amongst academic staff. First, cognitive and behavioural strategies should be employed to strengthen self-efficacy in those academics thinking about or intending to become active. In accordance with self-efficacy theory [15], sources of self-efficacy should be considered in the structure of any intervention. This could include: 1) consciousness raising initiatives aimed at raising awareness and encouraging staff to perform activities they have done in the past, such as walking or attending organized exercise classes on campus; 2) offering staff access to helpful relationships through campus recreation who may be able to model various activities and explain how they may be performed during work or while commuting; 3) through email, offering staff encouragement for getting involved in any physical activities potentially coupled with some form of reward system; and 4) helping staff recognize the important physiological and affective responses associated with being active. Additionally, strategies should focus on tailored, simple approaches to overcome challenges in engaging in and maintaining physical activity. Messaging regarding barriers could focus on how participants can incorporate activity during working hours with little effort to learn additional skills. Most importantly, university employers must take the physical and mental health of their employees seriously and address systemic occupational challenges that not only lead to distress, but also prevent individuals from having the time necessary to engage in physical activity.

A number of study limitations must be noted. First, individuals who were more physically active or mentally healthy may have been more inclined to participate in the study, potentially skewing the results. Second, 10.6% of staff participated in this study and caution should be expressed with regards to generalizing the results to all staff. Future research should attempt different strategies to engage more staff to participate in physical activity and mental health related research. Third, objective measures of physical activity were not used, thus activity levels could not be verified. Lastly, this was a cross-sectional study and only relationships between variables can be noted, not causal changes. Overall, it would

appear that physical activity interventions which aim to improve mental health in academic staff can be designed using the TTM, and should use specific strategies that target self-efficacy and perceived benefits and barriers to becoming active. Further prospective research is needed to examine changes in psychological mediators of physical activity and physical activity behaviour as well as aspects of mental health.

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