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# A step in the right direction? Change in mental well-being and self-reported work performance among physically inactive university employees during a walking intervention

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ABSTRACT

*Objective:* To examine well-being and work performance changes accompanying participation in a 16-week uncontrolled feasibility lunchtime walking trial.
*Method:* Participants were 75 (92% female; *M* age = 47.68) previously physically inactive non-academic employees from a large British university. Multilevel modelling analyses examined well-being and work performance trajectories from baseline to post-intervention, to four months later, controlling for group membership and trait affectivity.
*Results:* Increases in perceptions of health, subjective vitality, and work performance, and decreases in fatigue at work were observed. Changes were sustained four months after the end of the intervention. No changes were identified for enthusiasm, nervousness and relaxation at work.
*Conclusion:* Although this was a relatively small uncontrolled feasibility trial, the results suggest that participation in a walking programme may be associated with sustainable well-being benefits and improvements in perceptions of work performance.



The effects of physical activity on the prevention and treatment of physical diseases such as coronary heart disease, stroke, diabetes, some cancers, and to a lesser extent obesity has been established for some time (Lee et al., 2012). Physical activity can also contribute to the prevention of some mental illnesses such as depression and anxiety (Camacho, Roberts, Lazarus, Kaplan, & Cohen, 1991; Teychenne, Ball, & Salmon, 2008), dementia, Alzheimer's disease and can delay cognitive decline (Blondell, Hammersley-Mather, & Veerman, 2014; Hamer & Chida, 2009). There is also extensive evidence to indicate that physical activity can improve people's self-perceptions and self-esteem, mood and subjective well-being, reduce stress and improve sleep quality (Biddle, Fox, & Boutcher, 2000; Penedo & Dahn, 2005). The Chief Medical Officer of the UK Department of Health (2011) has recommended that to achieve or maintain health and well-being, individuals should be encouraged to accumulate 150 min of moderate intensity activity in bouts of 10 min or more. However, the UK adult population remain insufficiently active (i.e., do not meet physical activity recommendations set by the UK Department of Health) to accrue health benefits (Craig, Mindell, & Hirani, 2009) and maintain low levels compared to many similar European countries (Sjöström, Oja, Hagströmer, Smith, & Bauman, 2006).

Workplace physical activity programmes are becoming increasingly popular as a means to improve public and employee health. There is evidence of some (although limited) effectiveness, with workplace walking interventions being more effective than those using other types of activity (Abraham & Graham-Rowe, 2009). However, relating to pedometer based interventions in the workplace specifically, a Cochrane review conducted by Freak-Poli, Cumpston, Peeters, and Clemes (2013) found insufficient evidence for the effectiveness of such interventions in increasing physical activity and improving health outcomes. This is despite recent reviews by Brown, Gilson, Burton, and Brown (2011) and Cancelliere, Cassidy, Ammendolia, and Côté (2011) have provided support for

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the role of workplace health promotion programmes, such as walking, in improving well-being, worker performance and productivity. However, the research examining the impact of workplace physical activity interventions is characterised by several limitations. They draw attention to the paucity of systematic investigations of the effects of workplace physical activity interventions on a range of well-being indicators that are concurrently sensitive to change and responsive to physical activity participation (Brown et al., 2011). In order to address this shortfall, in the current study, we sought well-being variables of particular relevance to work and performance, and which had also been found to be responsive to physical activity.

Job affect (referring to affective states such as enthusiasm, relaxation, exhaustion and apprehension experienced while at work), is an important predictor of work performance (Wright & Cropanzano, 2000). Changes in affective states are also one of the most consistent outcomes of participation in physical activity, including walking. For example, a meta-analysis has reported a moderate effect of physical activity on increases in energy and reductions in fatigue (Puetz, O'Connor, & Dishman, 2006). In another meta-analysis, Reed and Ones (2006) reported increases in high activation positive affect (e.g., energy) from exercise training (Cohen's $d = .47$), which was moderated by pre-exercise scores so that those with lower energy scores showed larger effects (Cohen's $d = .63$). With regard to walking specifically, Ekkekakis, Hall, VanLanduyt, and Petruzzello (2000) have shown that walks of self-selected intensity as short as ten minutes result in increases in pleasure. Most of the studies included in the meta-analyses reported by Puetz et al. and Reed and Ones did not include employee samples, but the results suggest that physical activity may work as a means of self-regulating job-related affective states. As suggested by Hecht and Boies (2009), physical activity may work to recover psychological resources that have been depleted during the course of work.

When the research on physical activity and affect is considered overall, there is stronger evidence for an effect of physical activity on positive energy-related dimensions of affect and fatigue rather than anxiety/nervousness and relaxation related aspects (Puetz et al., 2006; Reed & Ones, 2006). This research has however mainly been conducted using non-work measures, except for one cross-sectional study employing structural equation modelling which showed a significant relationship between physical activity participation and enthusiasm at work (an indicator of positive job-related energy; Thøgersen-Ntoumani, Fox, & Ntoumanis, 2005).

Non context-specific well-being constructs such as subjective vitality and health perceptions may also be relevant to the work context. Subjective vitality, defined as available energy and feelings of aliveness available to the self (Ryan & Frederick, 1997) is conceptually distinct from, yet significantly associated with, positive and negative affect (Ryan & Deci, 2008). As reported by Penninx et al. (2000) and Ryan and Frederick (1997), when people report high levels of subjective vitality, they are more productive, proactive, they cope better with stress and generally report greater levels of mental health and well-being. Further, perceptions of health, as a component of quality of life, have been implicated in workplace absenteeism (Collins et al., 2005), presenteeism (Hemp, 2004) and work performance (Wynne-Jones, Buck, Varnava, Phillips, & Main, 2009, 2011). Both constructs have been associated positively with physical activity participation (Brand, Schlicht, Grossman, & Duhnsen, 2006; Rozanski, Blumenthal, Davidson, Saab, & Kubzansky, 2005), but the effect on subjective vitality as a result of a workplace walking intervention has not yet been determined.

A further weakness of the body of research on this topic arises from the great range and diversity of indicators used to measure work performance (Brown et al., 2011; Cancelliere et al., 2011). More consistent use of brief, standardised and validated measures of perceived global work performance are needed for more meaningful comparisons across studies.

From public health and specifically health inequality perspectives, it is important to focus interventions on those who have health need and who stand to gain most. Few workplace physical activity interventions have targeted employees who are physically inactive (Hutchinson & Wilson, 2012). This limitation may explain the divergent findings in this area of research.

Further, few trials have examined the sustained effects of such interventions, i.e., beyond the end of the intervention period. This is critical in order to determine the sustainability of intervention effects.

Finally, workplace walking interventions usually take place in outdoor settings, and thus the lack of research examining the effects of workplace walking interventions taking place in different seasonal periods is surprising. In the only study to date examining this question in a workplace setting, we found that a 16-week lunchtime walking intervention was equally feasible during winter or summer (Thøgersen-Ntoumani, Loughren, Duda, & Fox, in press). However, the well-being and work performance effects of this intervention were not examined. This is important as some research has shown that weather is associated with affective experiences (Keller et al., 2005), and findings could have practical implications for future programming.

In view of the above, the purpose of the present study is to examine trajectories in well-being and work performance as a result of participation in a 16-week lunchtime walking intervention with two groups receiving the intervention at different times of the year. We adopted a range of specific and general well-being indicators with potential to be responsive to physical activity participation and which are relevant to work performance. We assessed whether or not such changes could be sustained in the longer-term (up to four months later). Specifically, we hypothesised significant linear increases in perceptions of health, subjective vitality, enthusiasm, and global work performance and decreases in fatigue at work from baseline to post-intervention (week 16) and these trends to be sustained at the four month follow-up. In contrast, we did not expect significant changes in nervousness or relaxation at work. We also expected equivalence in trajectories between the two groups who completed the intervention at different times of the year. Due to established associations (Kaplan, Bradley, Luchman, & Haynes, 2009), in examining well-being changes, we controlled for the influence of trait affectivity.

## 1. Method

### 1.1. Participants

Participants were 75 (92% female; $M$ age = 47.68; $SD$ = 10.31; age range = 24–63) physically inactive non-academic employees from a large British university. The majority (50.7%) of participants were married, while 25.3% were single, 12% were divorced and 12% lived with a partner. All the participants were administrative or support staff with desk-based jobs. Thirty-two out of 43 University departments or corporate services were represented in the study. Thirty-four participants described themselves as being in academic-related posts (e.g., library services, pension officers), 31 worked as 'support staff' (e.g., secretaries within academic Schools and departments, finance officers, admissions personnel), and 10 defined themselves as working in 'other' positions (including marketing, counselling services, and student support services). The majority of participants were of white British origin (85.30%) with the remaining participants characterising themselves as Asian (6.70%), Black (4%), Chinese (2.70%), or "other" (1.30%). Participants