Employee perceptions of a pedometer walking intervention in a hospital workplace

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(Received 3 June 2014; accepted 4 February 2015)

Citation: Holly Blake & Mark E. Batt (2015) Employee perceptions of a pedometer walking intervention in a hospital workplace, International Journal of Health Promotion and Education, 53:5, 257-270, DOI: 10.1080/14635240.2015.1016621

To link to this article: http://dx.doi.org/10.1080/14635240.2015.1016621

Accepted 04.02.2015, Published Online 02.03.2015

Abstract

Pedometer-based interventions are showing promise in workplace settings although little is known about participants' perceptions of such schemes in the health care workplace. Data from exit questionnaires (n = 296) were used to determine demographic characteristics of those who took part, and examined employees' experiences of a 6-week workplace pedometer-based physical activity 'challenge' intervention in a hospital setting. This intervention was accessed by predominantly female health care employees of all ages and all occupational groups, although the majority were in nursing, allied health professions or office-based sedentary job roles. One-third of participants did not meet recommended levels of physical activity at the outset, and more than half of the participants were overweight or obese. Social support to engage in the intervention came mostly from work colleagues. Almost all completed the programme and strategies for increasing step-counts were self-selected and diverse. Barriers to engagement varied but most commonly included lack of time or technical difficulties with the pedometer. Benefits of programme participation were reported irrespective of prior level of physical activity. Participants described the pedometer intervention as useful for self-monitoring and goal setting and were motivated by the competitive element and being part of a team. Participants generally valued the concept of interventions for health offered by their employer. Pedometer-based physical activity promotion is well-received by health care employees and delivery is feasible within a multi-site hospital trust. Health care organisations should offer interventions that encourage physical activity among employees, particularly those with a group- based component.

Keywords: physical activity; pedometer; workplace; hospital

Introduction

Workplaces are an important setting for the delivery of health promotion (WHO (World Health Organisation) and WEF (World Economic Forum) 2008; DH (Department of Health 2004) and workplace physical activity initiatives have met with some success (Malik, Blake, and Suggs 2014). The World Health Organization's Health Promoting Hospitals and Healthy Services Network advocate the promotion of health in hospital settings, and all who come into contact with them. This concept has been embraced within the UK where initiatives to promote health and well-being in the National Health Service (NHS) are on the increase (Blake et al. 2013a; Blake, Zhou, and Batt 2013; Blake and Lloyd 2008). A particular challenge for health promoters targeting health care workplaces is to deliver interventions that are attractive to employees from diverse job roles, working environments and shift patterns.

Walking continues to be the most favoured and convenient exercise choice for the majority of the population (Ham, Kruger, and Tudor-Locke 2009), and among health promoters is perceived to be a physical activity that is most likely to be sustainable by the sedentary majority. Pedometers have been used to promote walking and to assist people in setting and meeting physical activity goals. Pedometers are highly accessible, simple, unobtrusive and inexpensive body-worn motion sensors providing instantaneous, personalised feedback on number of walking steps (Tudor- Locke et al. 2006).

Pedometer interventions delivered in the workplace have been shown to increase physical activity levels, particularly in sedentary workers (Chan et al. 2004), although we know little about the characteristics of employees who opt to engage with them in a workplace setting. Data from community interventions have shown that pedometers are most commonly used by females with a body mass index (BMI) >30, aged 45 and over, who are educated and in paid employment (Eakin et al. 2007); studies conducted in academic workplaces have also found majority female participants (Speck et al. 2010; Puig-Ribera et al. 2008). Although previous studies have shown that pedometer interventions can increase physical activity levels by observing individual-level changes in step counts (Chan et al. 2004) or self-reported walking (Hess, Borg, and Rissel 2011), few studies

have considered participants' perceptions of these interventions. Personal perceptions of pedometers are important since those individuals who use pedometers and perceive them to be useful are more likely to meet physical activity recommendations (Borg, Merom, and Rissel 2010). Participants in workplace pedometer programmes in non-health care settings have described the pedometer as a useful, valuable and reliable technological aid for increasing awareness of physical activity, which motivates and empowers individuals to self-monitor their progress towards self-selected goals (Lauzon et al. 2008; Hunt et al. 2013). Personal and team goal-setting and physical activity in working-age adults (Dishman et al. 2009). Participants have also reported that group-based interventions and participation of co-workers provide both motivation and social support (Lauzon et al. 2008).

This study aimed to evaluate (1) the profile of health care employees choosing to access workplace pedometer walking interventions, and, (2) the perceptions of health care employees towards team-based, pedometer interventions for the promotion of physical activity.

Methods

All employees of an NHS hospital trust in the UK were invited to participate in a 6-week 'pedometer challenge' intervention designed to encourage increased participation in moderate physical activity. There were 13,606 employees at the participating organisation and all were eligible to participate. Pedometer challenges are offered regularly (approximately quarterly) at the participating trust and have been offered since 2005. The pedometer challenges are delivered as part of a large-scale employee wellness programme based at three hospital sites of a single acute hospital trust. Employees are made aware of all upcoming health promotion initiatives, including the pedometer challenges, via information desks at internal 'Health and Wellbeing events', via employee 'Health and Wellbeing' notice boards, and information is circulated to employees via email. Employees who are interested in taking part in the pedometer challenge are required to independently contact the health and well-being team to register. This study is an evaluation of a series of four pedometer challenges that took

place at the participating hospital trust during January and December 2012, with a total of 296 employees. Ethical approval was provided by the local research ethics committee and research governance procedures were adhered to. Employees were invited to self- select to take part in one of four pedometer challenges throughout the year. Since this was a pragmatic intervention that was part of an employee health and well-being service offered to all employees within the hospital trust, eligibility was not restricted to any activity level (e.g., those who are most sedentary).

The pedometer challenge

Employees were invited to take part in a self-selected group of four (determined as an optimal group size by service users) and nominate a team captain. Informed consent was taken by the intervention co-ordinator. All participants were provided with a pedometer and 'challenge guide' with a step-count record sheet. Participants were encouraged to use the pedometer to aid in the setting of personal goals and decision-making about required behaviour change, and the benefits of an overall daily goal of 10,000 steps was highlighted. The intervention was informed by the Transtheoretical Model of Health Behaviour Change (Marcus and Simkin 1994). Specifically, participants were encouraged to self-set achievable goals that were based around their stage of change (readiness to engage in physical activity). They were encouraged to use behavioural and cognitive strategies as they moved from pre-contemplation to maintenance (Marcus et al. 1992) to build self-efficacy (or confidence) in their ability to increase their activity level. Recommended behavioural strategies included use of a support 'buddy' (other team members) or use of personal or team rewards. Recommended cognitive strategies included personal re-evaluation of walking behaviour. Participants were encouraged to think about the benefits and costs of being more active ('decisional balance') to help them move forwards through the stages of change and to consider how they would reduce perceived barriers to active lifestyles.

Individuals were asked to record their daily total steps and submit their weekly total to the wellness programme manager via their team captain. Participants were informed that steps were to be counted during and after work, and include the weekend and holidays. Team step count summaries were circulated to all team members at regular intervals with reminders about their goal and the importance of physical activity. Participants were informed that the team with the highest score would win a prize at the end of the intervention. Since the purpose of the study was not to assess health behaviour change, but to ascertain participants' experiences and perceptions of taking part in a workplace pedometer challenge intervention, submitted step counts were not recorded by the study team. Due to employee confidentiality reasons, demographic and health-related data are not routinely stored for those employees who have participated, or chosen not to participate in the workplace pedometer challenges.

All employees who participated in a pedometer challenge during the study period were invited to complete structured exit questionnaires (choice of either paper or online versions) at the end of their intervention, to obtain information on participant characteristics (e.g., age, gender, staff group, shift worker), employees' evaluation of the challenge, methods used by employees to increase step counts and employees' perceived level of encouragement from others. Data were collected on barriers and determinants of participation and self-reported attitudes towards physical activity levels over the coming year. Participants were also invited to provide qualitative feedback about the programme in an open-ended question item.

Data analysis

Data were analysed in SPSS for Windows, Version 21.0 (SPSS Inc., Chicago, IL). Descriptive analyses were undertaken, together with chi-square tests and t-tests. Qualitative responses were analysed using thematic text analysis to investigate occurrence or co-occurrence of themes (Braun and Clarke 2006).

Evaluation results

Demographic and health characteristics

Of the 13,606 employees at the trust, 296 employees took part in a pedometer challenge during the study period and 100% completed exit questionnaires. Data on those who have previously attended or those who chose not to attend were unavailable as this is not

collected or stored by the organisation for reasons of employee confidentiality.

Our population and sample were predominantly female (sample = 94% female; hospital trust = 76.5% female). Age of participants ranged from 21 to 70 years, which fell predominantly within the most populated age categories in the hospital trust (just 1.4% of trust employees are outside of this age range). The majority of the participants were from administrative or managerial roles, allied health professions (AHP) or nursing, which are the largest occupational groups within the participating hospital trust. The sample included employees from all three of the hospital sites within this trust.

BMI was calculated from self-reported weight and height using the following formula:

 $BMI = \frac{\text{weight in kilograms}}{\text{height in metres} \times \text{height in metres}}$

Individuals were classified into categories according to their BMI (>18.5 = underweight, 18.5-24.9 = normal weight, 25-29.9 = overweight, >30 = obese).

Over half of the participants in this sample (n = 134, 52%) reported that they were either overweight or obese. Approximately two-thirds (67.6%; n = 190) reported that they met recommended daily levels for physical activity (specified at the time of the study as, '30 min of moderate physical activity on most days per week'). Demographic and health data for participants are reported in Table 1.

[insert Table 1 here]

Social support for participation in the programme

Participants reported whether or not they had received support for undertaking this physical activity 'challenge' from their family, friends or work colleagues. Those reporting no encouragement from anyone to take part had a significantly higher BMI than those who received some form of social support for participation (p < 0.01). Reported

support from others, and the strategies participants used to increase their physical activity level during the 6-week challenge are shown in Table 2.

[insert Table 2 here]

The most common strategies adopted for increasing step counts were using the stairs instead of the lifts, and increased walking for leisure. Participants reported additional strategies including marching on the spot, using active games (e.g., Nintendo Wii), walking a dog, engaging in physical activities and play with their children, dancing while undertaking chores, cycling and taking new and longer routes when actively travelling (walking or cycling for transport).

Strategies for increasing daily step counts

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Table 2. Strategies to increase physical activity, motivating factors and barriers to engagement.

Factors that motivated or hindered participants in the programme

The majority of participants reported that the pedometer challenge increased their motivation to be more active. Motivating factors and barriers to progress are shown in

Table 2. Additional motivating factors raised by participants included a desire to find out how active they were on a daily basis, gaining a sense of achievement from meeting their personal goals and finding the receipt of regular email reminders from the programme coordinators a motivating factor. Participants valued the opportunity to take part in a workplace physical activity programme that was perceived to be low burden, and did not interrupt or interfere with their daily work routine:

I found it motivating that the challenge fitted in with my working commitments and did not add to my workload.

Even those participants who were already active at the outset referred to the motivating nature of the programme to maintain their already-established healthy behaviour:

I enjoyed the challenge but as I am already very active it didn't improve what I do . . . but it did keep me motivated.

Although few participants identified barriers to participation, the most commonly reported barriers to successfully engaging with the pedometer challenge were a perceived lack of time, or technical difficulties with (or loss of) the pedometer. A minority of participants reported further barriers to engagement, which included bad weather or dark evenings prohibiting walking outside, personal sickness absence from work, a focus on family commitments, loss of team members due to holidays, and being employed in a sedentary job role that prevented them walking during working hours. The majority of participants reported that wearing a pedometer for 6 weeks was too long and recommended a shorter programme. A few participants indicated a frustration that not all steps they had taken were accurately recorded; this was related either to inaccuracy of the pedometers, or for women, a difficulty with securing the pedometer to certain types of clothing.

Participant perceptions of the pedometer intervention

The vast majority of respondents reported that they completed all 6 weeks of the challenge (95%, n = 255). Over three-quarters of respondents reported that they enjoyed

taking part in the pedometer intervention (76%, n = 216), with 64% (n = 184) feeling that participation had encouraged them to think further about their health; women significantly more so than men (p < 0.01). More than half of the respondents felt that they had increased their level of physical activity during the intervention (58%, n = 169), with 43% (n = 123) reporting that they continued to increase their level of physical activity after the pedometer challenge had ended:

Since the pedometer challenge I have increased my activity levels. I attend my local gym twice a week for classes. I will definitely continue with the pedometer challenge.

Some participants reported that the intervention encouraged them to evaluate their own behaviour and reflect on their own physical activity level:

I found having the pedometer very motivating and it made me realise how little exercise I do'; '... it made you realise that doing 10,000 steps a day did take more effort'.

Engaging in the intervention led to some participants being more active through changing their relationship with the physical environment, or changing the way in which they travelled to work and saving resources in the process:

... I get two buses, one into town and one out of town and then I realised that I could walk to work in the same time as getting two buses and not have to pay any money ... I have not got a bus pass anymore, it has shortened my perception of distances as I know I can get to the shop and back in half an hour which I would not have known before ... I realised it was easier to walk somewhere than to stand waiting for a bus.

Almost three-quarters of the sample reported that they had enjoyed engaging in a physical activity programme together with their work colleagues (73%, n = 210), with 68% (n = 195) reporting that being part of a team was a key factor in motivating them to be more active, and 66% (n = 189) reporting that the element of competition with others had encouraged them to increase their physical activity.

This was reflected in participants' feedback:

We all motivated each other and competed with each other to do more and try to beat each other . . . We encouraged each other to take the stairs and record our steps and any exercises. It was a good team building exercise.

We had great fun competing with each other ... despite all the things I did on holiday I made sure I still wore it so as not to let the team down.

There were gender differences evidence, with men being significantly more likely than women to report that being part of a team motivated them to be more active (p = 0.01). The majority of respondents recognised that physical activity was important for their health (80%, n = 229). The value of a workplace physical activity intervention was recognised by participants who appreciated the opportunity to be encouraged to be active during working hours, and to increase their physical activity without interrupting family responsibilities:

If you have done activity during the working day then it helps as you don't feel like doing it when you get home, if you have the will to do it you can fit physical activity into your daily life.

Participants also recognised the value of physical activity for weight management:

I absolutely loved this challenge . . . I've lost 7 stone in the last year and a half, and this challenge refreshed my mind and gave me a boost

Two-thirds of participants (66%, n 1/4 188) explicitly reported that they felt positively towards activities offered by their employer that are focused on improving the health of employees. One participant reported:

We appreciate everything that the [health and wellbeing] service is trying to achieve, putting things on and trying to get people interested . . . and involved.

For 41% (n = 118) of participants (and significantly more women than men, p < 0001), taking part in the pedometer intervention had generated an overall interest in the services offered to staff by the hospital trust, and had encouraged them to seek out further health

and well-being activities offered by their employer, such as general health checks, active travel initiatives, musculoskeletal advice or complementary therapies.

Further details of participants' responses to survey items are reported in Table 3.

Discussion

The intention of this study was to provide an overview of those employees who are most likely to access pedometer walking interventions in hospital workplace settings, and to evaluate their perceptions towards pedometer-based walking interventions and workplace health and well-being interventions in general. Findings demonstrate that a 6-week workplace pedometer intervention can be feasibly delivered to health care employees as part of a multi-component employee wellness programme delivered in the hospital workplace. This low-cost, easily implemented intervention attracted employees from all three sites of health care workplace including all age groups and tenures, shift workers and non-shift workers, and employees from diverse occupational backgrounds including those working in frontline patient care, and those in sedentary, office-based job roles. The intervention was accessed by employees who considered themselves sedentary and/or overweight or obese, as well as those who were already active and/or a healthy weight. On the whole, perceptions of the intervention were positive and participants valued the opportunity to engage in a health promotion initiative in their place of work. Overall, adherence to the programme was high even though no incentives were offered for weekly compliance; the majority of participants reported that they enjoyed the experience and provided positive evaluation.

Pedometer challenges have been offered to employees at this study site over a 10-year period through the development and expansion of a workplace wellness programme in an acute NHS trust, and therefore large numbers of employees have participated in pedometer interventions during this time, with numbers of participants increasing year on year. Participation of almost 300 employees during the specified evaluation period was deemed to indicate an ongoing interest in this scheme from employees at a level that warrants continued investment in this element of the wider programme. That the intervention attracted a diverse group of employees, including those in frontline care, is significant given the recent focus in the UK on improving the health of employees working within the NHS (DH (Department of Health) 2009; Esposito and Fitzpatrick 2011), and research evidence that shows high levels of overweight and obesity, and low levels of physical activity in NHS employees (Blake et al. 2012), and nurses (Malik, Blake, and Batt 2011; Blake et al. 2011). Nurses have been identified as a group that are notoriously hard to reach with workplace physical activity interventions; likely since their shift patterns and busy work schedules can prevent engagement in structured workplace exercise initiatives. It seems that pedometer interventions are appealing to nurses and therefore may be an appropriate mechanism for engaging those giving frontline care in workplace physical activity initiatives. This supports the argument for provision of workplace health programmes that include the promotion of incidental physical activities within the workplace (such as pedometer walking initiatives, active travel and stair-use), activities that do not necessarily rely on attendance at scheduled sessions or particular sites.

The largest group of participants in the pedometer challenge were from administrative, clerical or managerial job roles, traditionally perceived to be sedentary job roles. This is significant since it has been suggested that those individuals for whom work involves long hours of sitting should be the focus of efforts to promote physical activity both within and outside the workplace (Miller and Brown 2004).

Our participants were predominantly female; some studies have suggested that physical activity promotion programmes incorporating pedometers may be less appealing to men (Burton, Walsh, and Brown 2008); although the preponderance of females here is likely to be due to the exceptionally high female–male ratio in the trust population. This evaluation shows that many of the participants in the pedometer challenge report that they are of a healthy weight, and already active at the outset. Other studies have found that employees who had better health at the outset were more likely to respond positively to a pedometer-based workplace health program (Freak-Poli et al. 2011). Nevertheless, our evaluation shows that this pedometer intervention also engaged employees who self-reported that they were overweight, obese (more than half the participants) and/or

sedentary (one-third of the participants), although it should be noted that more than half of those who were inactive at the outset had expressed a 'readiness to change' or intention to increase their physical activity levels within the coming months. It may be that additional health promotion efforts are required to engage in workplace physical activity interventions those who are most sedentary and not yet contemplating change, since the recommended 10,000 steps/day proposed as part of this intervention may for some be perceived as out of reach (Musto et al. 2010).

Although objective changes in physical activity level were not the focus of this study, overall, there were many participants who self-reported an increase in walking and even those participants who met recommended levels of physical activity at the outset reported increases in walking and benefits to their motivation for physical activity maintenance. First, it would be interesting to determine whether there were differences in individual characteristics and physical activity levels between those employees who took part in the challenge and those who did not. Second, it would be interesting to determine whether there are differences in individual characteristics or perceptions of the pedometer challenge between those participants who met their individual physical activity goals and those who did not. Although this was beyond the scope of this evaluation, and despite suggestions that competition-based physical activity programs using pedometers may not be an effective means of increasing the long-term physical activity of employees (Behrens, Domina, and Fletcher 2007), many of our participants reported that they had continued to engage in a higher level of physical activity once the intervention ended, although to make these conclusions the long-term maintenance of physical activity needs to be tested objectively and followed up over time. Since the aim of this study was to consider the profile of those who chose to self-select into a pedometer intervention, and to evaluate individual perceptions of the initiative, we collected only group-level step counts and so we are unable to comment on whether the intervention significantly and objectively altered body composition or physical activity behaviour, or the impact of any resulting health behaviour change on organisational variables (e.g., sickness absence, productivity).

This intervention allowed for participant self-monitoring and goal setting; factors that

have previously been identified as valuable and motivating in pedometer interventions (Hunt et al. 2013). Engaging in physical activity as part of a team was a valued aspect of this intervention, and this is significant not least because higher worksite social support has been associated with a higher level of physical activity in employees (Tamers et al. 2011), but also because workplace physical activity interventions may serve to enhance social networks (Edmunds, Stephenson, and Clow 2013), which may have implications for employee mental health. We therefore would recommend that workplace wellness programmes seek to incorporate group-based activities for health promotion.

Importantly, many participants reported that taking part had not only raised their awareness of their own physical activity levels, but had encouraged them to think further about their health in general and seek out other health-promotion opportunities offered by their employer. This is encouraging since it suggests that workplace physical activity interventions may have scope for motivating employees to make lifestyle changes that stretch beyond the activities they original signed up for, and beyond those activities that are provided by the employer during working hours.

For some, taking part had altered their perception of the feasibility of lifestyle change, which was evident in employee accounts of their changed perceptions towards the physical environment resulting from their engagement in the programme, and increased active travel (walking or cycling for travel). This is consistent with the findings of pedometer interventions delivered in community settings that have demonstrated that participants perceive a lower distance to local facilities and a greater availability of cycle lanes after taking part (Wallmann et al. 2012).

Barriers to engagement with the intervention mostly related to technical factors, most notably lost pedometers or inaccuracy of pedometer recording. Due to limited resources, pedometers used here were not of the highest quality; whereas this study of participants' profiles and perceptions did not require accurate step count measurements, inaccuracy of step counts was raised a significant issue for several participants and this suggests that consideration for pedometer quality needs to be taken in future workplace pedometer interventions (Clemes et al. 2010). Some participants expressed a frustration that the pedometers did not reflect their true level of physical activity. Some women reported difficulties with attaching a pedometer to particular types of clothing. Others have identified that participants can feel 'cheated' that their engagement in non-ambulatory physical activity (e.g., cycling, weight lifting and swimming) would not be accumulated as steps (Miller, Brown and, and Tudor-Locke 2006). Bad weather had been a barrier to meeting goals for some, and this is consistent with studies suggesting that there may be a seasonal variation in pedometer use and number of steps accrued per day (LeCheminant et al. 2011), since this barrier was reported by those who took part in pedometer challenges during autumn or winter.

The intervention was delivered via a multi-component employee health and wellbeing programme and as such was designed to reflect the delivery of such interventions in practice, being accessible to all employees (rather than targeted to the most sedentary). Many studies have reported a longer intervention period, although it has been suggested that interventions of less than 8 weeks duration may be equally as effective as those lasting up to 15 weeks, with additional benefits accrued only after 15 weeks (Kang et al. 2009). Although we do not have objective data relating to health behaviour change, feedback from our participants suggests that 6 weeks was acceptable to participants, with a general view that a longer intervention period would not have been well accepted.

Conclusion

Pedometer-based interventions designed to encourage walking can feasibly be delivered among health care employees in a multi-site hospital setting. Such interventions attract employees of all ages, tenure and occupations, although the greatest number of participants come from sedentary job roles or the nursing and AHP, and more than half describe themselves as overweight or obese. Many of those who take part already meet recommended levels of physical activity, though not all, and participants report benefits irrespective of their level of physical activity at the outset. Participants find the competitive, team-based element to the activity motivating, coupled with increased awareness of personal physical activity levels from recording their activity and the ability to set personal and team goals. Attitudes of health care employees are predominantly positive towards pedometer interventions; many participants place value on health-related activities offered by their employer that fit flexibly around work schedules and assist them in making lifestyle changes.

Acknowledgements

The authors would like to thank the Nottingham University Hospitals NHS Trust Health and Wellbeing team for delivery of the intervention; in particular, Steph Knowles, Eleanor Bennett and Christine Woolley, and Dr Paul Leighton for support with evaluation processes.

References

Behrens, T. K., L. Domina, and G. M. Fletcher. 2007. "Evaluation of an Employer-Sponsored Pedometer-Based Physical Activity Program." Perceptual and Motor Skills 105 (3 Pt 1): 968–976. doi:10.2466/PMS.105.7.968-978.

Blake, H., and S. Lloyd. 2008. "Influencing Organisational Change in the NHS: Lessons
Learned from Workplace Wellness Initiatives in Practice." Quality in Primary Care 16
(6): 449–455. doi:10.1177/1757913913489611.

Blake, H., S. Malik, P. K. H. Mo, and C. Pisano. 2011. "Do as I Say, but Not as I Do':Are Next Generation Nurses Role Models for Health?" Perspectives in Public Health 131(5): 231–239. doi:10.1177/1757913911402547.

Blake, H., P. K. H. Mo, S. Lee, and M. E. Batt. 2012. "Health in the NHS: Lifestyle Behaviours of Hospital Employees." Perspectives in Public Health 132 (5): 213 – 215. doi:10.1177/1757913912457309.

Blake, H., L. S. Suggs, L. Aguirre, R. Tennyson, D. Zhou, and M. E. Batt. 2013a. "Technology- Based Intervention to Promote Physical Activity in a UK Healthcare Workplace in June-Sept 2012." European Journal of Public Health 23 (suppl. 1): 134. http://eurpub.oxfordjournals.org/ content/eurpub/23/suppl_1/local/complete-issue.pdf Blake, H., D. Zhou, and M. E. Batt. 2013. "Five-Year Workplace Wellness Intervention in the NHS." Perspectives in Public Health 133 (5): 262–271. doi:10:1177/1757913913489611.

Borg, J., D. Merom, and C. Rissel. 2010. "Staff Walking Program: A Quasi-Experimental Trial of Maintenance Newsletters to Maintain Walking Following a Pedometer Program." Health Promotion Journal of Australia 21 (1): 26–32. doi:10.1186/1472-6963-8-169.

Braun, V., and V. Clarke. 2006. "Using Thematic Analysis in Psychology." Qualitative Research in Psychology 3 (2): 77–101. ISSN 1478-0887.

Burton, N. W., A. Walsh, and W. J. Brown. 2008. "It just Doesn't Speak to Me: Mid-Aged Men's Reactions to '10,000 Steps a Day'." Health Promotion Journal of Australia 9 (1): 52 – 59. doi:10. 1017/HE08052.

Chan, C. B., D. A. J. Ryan, and C. Tudor-Locke. 2004. "Health Benefits of a Pedometer-Based Physical Activity Intervention in Sedentary Workers." Preventive Medicine 39 (6): 1215–1222. doi:10.1016/j.ypmed.2004.04.053.

Clemes, S. A., S. O'Connell, L. M. Rogan, and P. L. Griffiths. 2010. "Evaluation of a Commercially Available Pedometer Used to Promote Physical Activity as Part of a National Programme." British Journal of Sports Medicine 44 (16): 1178–1183. doi:10.1136/bjsm.2009.061085.

DH (Department of Health). 2004. Choosing Health: Making Healthy Choices Easier. London, UK: The Stationary Office.

DH (Department of Health). 2009. NHS Health and Wellbeing Review: Interim Report. London, UK: The Stationary Office.

Dishman, R. K., D. M. DeJoy, M. G. Wilson, and R. J. Vandenberg. 2009. "Move to Improve: A Randomized Workplace Trial to Increase Physical Activity." American Journal of Preventive Medicine 36 (2): 133–141. doi:10.1016/j.amepre.2008.09.038.

Eakin, E. G., K. Mummery, M. M. Reeves, S. P. Lawler, G. Schofield, A. J. Marshall,

and W. J. Brown. 2007. "Correlates of Pedometer Use: Results from a Community-Based Physical Activity Intervention Trial (10,000 Steps Rockhampton)." International Journal of Behavioural Nutrition and Physical Activity 4 (1): 31. doi:10.1186/1479-5868-4-31.

Edmunds, S., D. Stephenson, and A. Clow. 2013. "The Effects of a Physical Activity Intervention on Employees in Small and Medium Enterprises: A Mixed Methods Study." Work 46 (1): 39–49. doi:10.3233/WOR-121523.

Esposito, E. M., and J. J. Fitzpatrick. 2011. "Calling Nurses to Exercise as Role Models for Their Patients." Science Daily, Science News; August 30: 2011.

Freak-Poli, R. L., R. Wolfe, H. Walls, K Backholer, and A. Peeters. 2011. "Participant Characteristics Associated with Greater Reductions in Waist Circumference during a Four- Month, Pedometer-Based, Workplace Health Program." BMC Public Health 11 (1): 824. doi:10.1186/1471-2458-11-824.

Ham, S. A., J. Kruger, and C. Tudor-Locke. 2009. "Participation by US Adults in Sports, Exercise, and Recreational Physical Activities." Journal of Physical Activity and Health 6 (1): 6–14. PMID: 19211953.

Hess, I., J. Borg, and C. Rissel. 2011. "Workplace Nutrition and Physical Activity Promotion at Liverpool Hospital." Health Promotion Journal of Australia 22 (1): 44–50.

Hunt, K., C. McCann, C. M. Gray, N. Mutrie, and S. Wyke. 2013. "You've Got to Walk Before You Run': Positive Evaluations of a Walking Program as Part of a Gender-Sensitized, Weight- Management Program Delivered to Men through Professional Football Clubs." Health Psychology 32 (1): 57–65. doi:10.1037/a0029537.

Kang, M., S. J. Marshall, T. V. Barreira, and J. O. Lee. 2009. "Effect of Pedometer-Based Physical Activity Interventions: A Meta-Analysis." Research Quarterly for Exercise and Sport 80 (3): 648–655. doi:10.1080/02701367.2009.1-599604.

Lauzon, N., C. B. Chan, A. M. Myers, and C. Tudor-Locke. 2008. "Participant Experiences in a Workplace Pedometer-Based Physical Activity Program." Journal of Physical Activity and Health 5 (5): 675–687.

LeCheminant, J. D., J. D. Smith, N. K. Covington, T. Hardin-Renschen, and T. Heden. 2011. "Pedometer Use in University Freshmen: A Randomized Controlled Pilot Study." American Journal of Health Behaviour 35 (6): 777–784. PMID: 22251768.

Malik, S., H. Blake, and M. E. Batt. 2011. "How Healthy Are Our Nurses? New and Registered Nurses Compared." British Journal of Nursing 20 (8): 489–496. doi:10.12968/bjon.2011.20.8. 489.

Malik, S. H., H. Blake, and L. S. Suggs. 2014. "A Systematic Review of Workplace Health Promotion Interventions for Increasing Physical Activity." British Journal of Health Psychology 19 (1): 149–180. doi:10.1111/bjhp.12052.

Marcus, B. H., V. C. Selby, R. S. Niaura, and J. S. Rossi. 1992. "Self-Efficacy and the Stages of Exercise Behavior Change." Research Quarterly in Exercise and Sport 63 (1): 60–66. doi:10.1080/02701367.1992.10607557.

Marcus, B. H., and L. R. Simkin. 1994. "The Transtheoretical Model: Applications to Exercise Behaviour." Medicine and Science in Sports and Exercise 26 (11): 1400–1404. doi:10.1249/00005768-199411000-00016.

Miller, R., and W. Brown. 2004. "Steps and Sitting in a Working Population." International Journal of Behavioural Medicine 11 (4): 219–224. doi:10.1207/s15327558ijbm1104_5.

Miller, R., W. J. Brown and, and C. Tudor-Locke. 2006. "But What about Swimming and Cycling? How to 'Count' Non-Ambulatory Activity When Using Pedometers to Assess Physical Activity." Journal of Physical Activity and Health 3: 257–266.

Musto, A., K. Jacobs, M. Nash, G. DelRossi, and A. Perry. 2010. "The Effects of an Incremental Approach to 10,000 Steps/Day on Metabolic Syndrome Components in Sedentary Overweight Women." Journal of Physical Activity and Health 7 (6): 737–745. PMID: 21088304. Puig-Ribera, A., J. McKenna, N. Gilson, and W. J. Brown. 2008. "Change in Work Day Step Counts, Wellbeing and Job Performance in Catalan University Employees: A Randomised Controlled Trial." Promotion and Education 15 (4): 11–16. doi:10.1177/1025382308097693.

Speck, R. M., R. K. Hill, N. P. Pronk, M. P. Becker, and K. H. Schmitz. 2010. "Assessment and Outcomes of Healthpartners 10,000 Steps(r) Program in an Academic Work Site." Health Promotion Practice 11 (5): 741–750. doi:10.1177/1524839908330745.

Tamers, S. L., S. A. Beresford, A. D. Cheadle, Y. Zheng, S. K. Bishop, and B.
Thompson. 2011. "The Association between Worksite Social Support, Diet, Physical Activity and Body Mass Index." Preventive Medicine 53 (1-2): 53–56.
doi:10.1016/j.ypmed.2011.04.012.

Tudor-Locke, C., S. B. Sisson, S. M. Lee, C. L. Craig, R. C. Plotnikoff, and A. Bauman.2006. "Evaluation of Quality of Commercial Pedometers." [Article in English, French]Canadian Journal of Public Health 97 (Suppl 1): S10-5–S10-6.

Wallmann, B., H. Spittaels, I. De bourdeaudhuij, and I. Froboese. 2012. "The Perception of the Neighborhood Environment Changes After Participation in a Pedometer Based Community Intervention." International Journal of Behavioural Nutrition and Physical Activity 9 (1): 33. doi:10.1186/1479-5868-9-33.

World Health Organisation (WHO) and World Economic Forum (WEF). 2008. Preventing Non- Communicable Diseases in the Workplace through Diet and Physical Activity – WHO/World Economic Forum Report of a Joint Event (No. NLM classification: WA 400), Geneva, Switzerland: World Health Organization (WHO).

Characteristic	n (%)		
Gender	n = 283		
Female	266 (94)		
Male	17 (6)		
Education	n = 283		
No qualifications	6 (2.1)		
Secondary education or higher	277 (97.9)		
Occupational group	n = 279		
Administrative/clerical/management	105 (37.6)		
Allied health professional	68 (24.4)		
Nursing	55 (19.7)		
Science and professional	30 (10.8)		
Technician	7 (2.5)		
Maintenance	3 (1.1)		
Medical	6 (2.2)		
Ancillary	5 (1.8)		
Work status	n = 285		
Full-time	215 (75.4)		
Part-time	70 (24.6)		
Shifts	n = 282		
Shift worker	34 (12.1)		
Not shift worker	248 (87.9)		
BMI	n = 258		
Underweight	9 (3.5)		
Healthy weight	115 (44.6)		
Overweight	82 (31.8)		
Obese	52 (20.2)		
Do you take part in 30 min of moderate physical activity	n = 281		
on most days of the week?			
No and I do not intend to in the next 6 months	11 (3.9)		
No but I intend to in the next 6 months	20 (7.1)		
No but I used to (over 6 months ago)	32 (11.4)		
No but I intend to in the next month	28 (10)		
Yes but for less than 6 months	40 (14.2)		
Yes and for more than 6 months	150 (53.4)		
	range, mean, sd		
Length of employment at trust	n = 276		
	Range 3-444 months		
	mean 134.26, sd 111.09		
Age	n = 272		
-	Range 21-70 years		
	mean 42.57, SD 10.12		

Table 1. Demographic and health characteristics of participants.

SD, standard deviation.

	n (%)
Strategy adopted $(n = 289)$	
Climbing the stairs instead of using the lift	194 (67.1)
Walking for recreation (not travel)	183 (63.3)
Walking to talk to a colleague (rather than using telephone/email)	98 (33.9)
Walking to or from work	97 (33.6)
Parking further away or getting off the bus a stop early	88 (30.4)
Jogging/running	69 (23.9)
Moving around while on the telephone	61 (21.1)
Structured exercise classes	39 (13.5)
Social Support $(n = 291)$	
Encouragement from colleagues	162 (55.7)
Encouragement from friends	52 (17.9)
Encouragement from family	43 (14.8)
Received no encouragement	42 (14.4)
Motivating factor for participation $(n = 291)$	
Feeling part of a team and setting team goals	144 (49.5)
Being part of a competition/wanting to win	113 (38.8)
Recording personal scores and setting personal goals	152 (52.2)
Having the opportunity offered by the employer	51 (17.5)
Fitted with long-term plans for increasing physical activity	45 (15.5)
Barriers to engagement $(n = 291)$	
Lack of time or too busy	66 (22.7)
Broken/lost pedometer	45 (15.5)
Too tired	32 (11)
Poor health/injury	27 (9.3)
I am already active enough	13 (4.5)
Team members dropped out	12 (4.1)
Lack of motivation	11 (3.8)
Did not enjoy the programme	4 (1.4)
Do not think increasing physical activity is important	0 (0)

Table 2. S	strategies to increase	physical	activity, motivating	factors and barriers	to engagement.
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