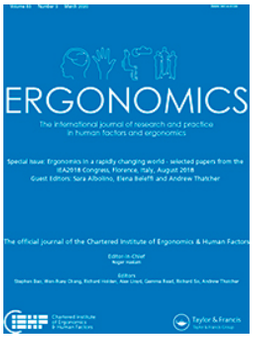

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ARTICLE

Process evaluation of a tailored workplace intervention designed to promote sustainable working in a rapidly changing world

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ABSTRACT

Increasing numbers of people are employed in sedentary occupations, spending large amounts of time sitting at work which is detrimental to health and wellbeing. Evidence-based guidance is required to intervene to reduce sedentary behaviour, encourage physical activity and promote sustainable working. This article presents a process evaluation of a successful workplace intervention Walking Works Wonders, shown to be effective in improving health, job satisfaction and motivation (Haslam et al. 2018). In this qualitative process evaluation employees reported an increased awareness of their sedentary time and they particularly valued the monitoring of activity using pedometers. They described changes to their working and leisure time activity to accumulate more steps. Participants reported improved physiological and psychological health outcomes, improved working relations with colleagues, changes in dietary behaviour and involving their families in physical activity. The results highlight elements of the intervention that encouraged healthy and more sustainable working practices.

Practitioner summary: This study provides the employees' perspective on the effective elements of a workplace intervention which encouraged physical activity and reduced sitting time. The results offer valuable insights for practitioners aiming to develop interventions to improve health and facilitate more sustainable working practices in a rapidly changing world of work.

Abbreviations: BMI: body mass index; PDF: portable document format

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Process evaluation; workplace intervention; physical activity; sedentary behaviour

Introduction

By 2020 over a third of the UK workforce will be aged over 50 (Department of Work and Pensions 2013). The increasing age of the workforce presents opportunities and challenges for governments, employers and health professionals, but also for individual employees and their families. In a recent overview of European legislation and research concerning older workers, it was concluded that the working environment is an ideal platform to carry out initiatives to promote active and healthy ageing (Mucci et al. 2019). It is now essential to facilitate sustainable working and extend working lives by promoting health in the workplace. The ageing workforce creates a demand for research to support evidence-based policy and practice promoting and maintaining the health, quality of life and employability of the workforce in a rapidly changing world.

Economic advances and industrial innovation have resulted in large numbers of people employed within sedentary occupations and data suggests that workers spend more time sitting at work than they do sleeping at night (Kazi et al. 2014). Sedentary behaviour is a major risk factor for a range of chronic diseases and is associated with an increased risk of premature mortality (Biswas et al. 2015; Wilmot et al. 2012). It is estimated to cost the National Health Service at least £450 M per year and places a great burden on society (Public Health England 2016). Sedentary behaviour contributes to the annual economic cost of sickness and worklessness (unemployment due to ill health), which is estimated to be over £100 billion (Black 2008). Graham, Dugdill, and Cable (2005) have called for a closer partnership working, involving training for general practitioners to promote physical activity and

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refer patients to exercise referrals schemes. Sedentary behaviour represents a major public health issue and there is a pressing need for new research exploring how jobs can be designed to incorporate physical activity, balance physical and mental demands and promote productivity, health and wellbeing (Straker and Mathiassen 2009; Haslam 2017; Jones, Haslam, and Haslam 2017).

The workplace is an ideal arena for delivering health education and intervening to promote healthy lifestyle change. The Working Late research programme investigated the policy issues associated with later life working and developed interventions and design solutions to promote health, productivity and quality of working life. The Walking Works Wonders intervention was developed as part of the Working Late research programme. Walking Works Wonders is designed to increase physical activity and reduce sedentary behaviour at work. Walking Works Wonders involves tailoring health information according to employee's readiness to change. This approach is based on the Stage of Change Model (Prochaska and DiClemente 1982, 1983) which was originally developed within the context of smoking cessation. The approach recognises that when attempting to motivate behaviour change, success is greater when interventions align with recipients' attitudes and beliefs.

Walking Works Wonders was developed through extensive user engagement, with employees, managers and representatives from occupational health. Ten different work sites across the UK participated in the study. A large private sector telecommunications organisation selected 8 of its work sites, while a medium size public sector local authority involved both of its work sites. The worksites were allocated to 1 of 3 conditions: staged intervention, standard intervention or control group (to ensure that no cross-contamination of the material was possible between employees). In the staged (tailored) condition the health information was tailored according to recipients' readiness for change. Individuals considering increasing their levels of physical activity (contemplation/preparation) were provided with leaflets describing the benefits of physical activity and offering practical tips to increase daily levels of walking. Those not thinking about increasing their physical activity levels (pre-contemplation) were targeted with leaflets containing awareness raising information about the risks of inactivity. In the standard condition, participants received leaflets which offered generic physical activity advice already available via health promotion organisations. Those in the control group received no intervention material.

Employees were encouraged to participate with the offer of a free pedometer and feedback from an independent health assessment. Participants completed a questionnaire and undertook physiological and psychological measurements at six monthly intervals. The physiological measurements included: height, weight and body composition, blood pressure and resting heart rate. The intervention is described in detail by Kazi (2013), Kazi et al. (2018) and Haslam et al. (2018).

Haslam et al. (2018) conducted an evaluation of Walking Works Wonders over the intervention period (12 months) and a further 12 months follow-up. The impact of the tailored approach was investigated by comparing tailored interventions with standard conditions and control groups in a 24-month longitudinal study in the 10 worksites. Employees who received either a standard or tailored intervention demonstrated significantly higher self-reported workability and improved organisational commitment, job motivation, job satisfaction, and a reduction in intention to quit the organisation. The tailored interventions significantly reduced BMI and waist circumference compared to standard and control conditions. The results demonstrated that health interventions designed to increase physical activity and reduce sedentary behaviour are likely to be more effective where the information is tailored to employees' readiness to change.

Following the implementation of the Walking Works Wonders intervention a qualitative process evaluation (involving individual interviews) was conducted to investigate employee experiences of participating in the intervention. Behaviour change interventions are complex and often focus on recipients' physical and social environments and a process evaluation provides valuable information on the depth and breadth of intervention implementation and adherence (Young et al. 2008). Outputs from intervention research usually focus on quantitative results of the intervention and may neglect the factors related to the intervention process itself. The UK's Medical Research Council's guidance on evaluating complex interventions recommends qualitative approaches to measure recipient acceptability (Moore et al. 2015). Process evaluations provide feedback on the key elements of any intervention and specifically participant identified elements associated with positive outcomes (Devine et al. 2012). The aim of this study was to identify the elements of the intervention that encouraged positive behaviour change in a variety of workplace settings.

Method

Interview schedule development

To develop the semi-structured interview schedule, the aims of the intervention research were first outlined to ensure the questions reflected evaluating these factors, which helped to identify topics of discussion and the types of questions that should be included. The first draft of the interview schedule was reviewed by three academics experienced in qualitative research. The interview schedule was assessed for question phrasing and structure and a number of minor revisions were made in response to the verbal feedback received.

Sampling

This phase of the research aimed to recruit employees who participated in the workplace activity intervention described in Haslam et al (2018). Participants recruited for the interviews included workers who were allocated to the standard ($n = 34$) and staged ($n = 22$) intervention groups. The research employed a convenience sampling technique for the interviews and the employees self-selected themselves to participate.

Procedure

Participants were recruited via an additional question that was added to the introduction of the questionnaire during the data collection period of the mid-intervention health screening assessments. This question asked participants if they were interested in taking part in an interview study to discuss the activity intervention and any impact the intervention had on their lifestyle. Participants were selected based on the timing of the end of intervention revisits so that interviews could be conducted in person, whether the participant was from a site where the intervention was delivered (because those in the control group were not part of any specific intervention and therefore would have limited feedback) and the availability of participants themselves. The researchers were confident that data saturation would be reached after fifty interviews, as it is estimated that data saturation is achieved after 30 interviews in qualitative research (Marshall et al. 2013).

Before each interview discussion commenced, the participants were verbally briefed about the nature of the research and informed the discussions would be audio recorded for transcription and analysis. Participants were reassured that any data used would be represented in an anonymised fashion. All employees provided verbal consent to participate in the interview. Three interviewers who had previous experience in qualitative research and who were involved in the data collection process during the intervention conducted the interviews. No incentive was offered to the participants. The interviews took place during the end of intervention health assessments. Interviews were conducted either in person during the periods of the health assessment revisits or over the telephone.

Data management and analysis

The audio-recorded interviews were transcribed verbatim and were analysed simultaneously using thematic analysis by the sorting of material into emergent themes using the method described by Knodel (1993). This method includes stages to identify key themes from the discussions that contributed to a framework of overall themes. First, it is predicted that recollections from interview data are likely to be selective and partial, so one of the researchers became familiar with the data by reading the transcripts and studying observational notes. Secondly, conceptual observations about the data were made. This included noting down recurrent themes, summaries, explanations and responses to the questions posed by the researchers so that a thematic framework could be developed. Thirdly, similar themes and codes from all interview transcripts were clustered together and indexed. Finally, meaningful conclusions from the overall themes and clusters were interpreted at which the key objectives of the qualitative analysis were addressed (Kazi 2013).

The reliability of this analysis was ensured through a systematic review of the data by other members of the research team. The findings are fully summarised along with anonymous quotes to illustrate the theme being described. In total, a set of five key overall themes emerged from these analyses exploring: the recruitment and health screening process; learning points from the intervention; impact on health-related behaviours; individual developments; and feedback related to the intervention themes.

Results

Participant characteristics

Fifty-six individual interviews were conducted with participants where the workplace intervention was delivered. Forty participants were males and 16 participants were females. Table 1 displays the sample

characteristics from the participants and their corresponding site locations. The age of the sample was between 28–61 years old. Table 2 highlights the themes and sub-themes extracted from the interviews.

Theme 1: intervention recruitment

All employees were asked what attracted them to participate in the intervention. Some stated they were relatively active already and simply wanted to receive an objective measurement of their health outcomes compared to the general population. Other participants reported that they knew they were unhealthy, unfit or overweight but wanted to change this, so health screenings over a period of time provided them with an opportunity to measure where they were at the beginning and assess if any improvements had been made:

> I knew I was desperately out of shape when I started … So when this came along I thought it would be pretty good to actually see what stage I am at and what difference something slightly more organised will make because I was very, very out of shape.

Some employees reported that they had existing health issues and were aware they needed to change their health-related behaviour and be more active. Others discussed a history of ill-health conditions that were common in their family, which they wanted to defend against:

> Around 6 months before [the health screening] I had a general check up at the doctor and one of the things that came back was that my cholesterol was a bit on the high side. I have got a family history of heart problems – my mother died at an early age and my brother died when he was 51 … I wasn't really exercising much, I do not really do sport.

Participants stated the low impact nature of walking was attractive as this meant employees with low

Table 1. Interviewee characteristics according to the site locations.

	Males	Females	Total per site
Edinburgh	2	1	3
Grafton	2	3	5
Ipswich	25	5	30
Liverpool	–	2	2
London	11	4	15
Newcastle	–	1	1
Total	40	16	56

Table 2. Themes extracted from the process evaluation with employees.

Themes	Summary of themes
Intervention recruitment	Reason for attending • Objective measure of health status • Wanted to be healthier • Free health screening and pedometer Feedback from health screening • Professional and comprehensive measures • Body composition analyser outputs commended
Intervention education	• Increased awareness of lack of physical activity • Health screenings highlighted health problems or risk of health problems • Informing participants of the benefits of regular walking • Intervention demonstrated how effective walking was for improving health • Pedometers are useful to motivate individuals to be more active
Impact on health-related behaviours	• Greater awareness of sitting time accumulated at work • Re-arranging daily routines to include opportunities for walking during the working day • Behavioural changes to increase incidental activities • Social benefits due to improved communication and team-based challenges at work • Increase in vigorous activities • Improvements in diet • Family involvement in physical activity
Individual developments	• Employees felt healthier as they lost weight • Employees noticed improvements in existing health conditions • Fitness levels increased • Participants reported feeling more relaxed
Intervention feedback	• Participants appreciated the email updates and posters • The communication made them feel part of a larger programme and inspired them to be more active • Posters with factual information regarding step counts and energy value of foods helped participants make healthy lifestyle changes • Participants suggested embedding themed poster information within emails or making the information accessible via the website • Improve input method for step counts on the website and provide more detailed options with a variety of outputs

fitness levels were able to join in, compared to any strenuous gym-based exercise initiatives. Some of the male respondents reported the free health screening provided them with an opportunity to have a health check and get physical activity advice which they would not have visited their GP for. Finally, the offer of a free pedometer was also reported as an attractive component to the recruitment strategy for this intervention:

> It just seemed like a really good opportunity to get free blood pressure tests … and the free pedometer appealed, and I am one of those who stuck it out I am still wearing it today.

Participants discussed the process of the actual health screenings and their experiences with the data collection procedures. Employees reported they felt comfortable during the collection of the physiological measures and that all the results were clearly explained to them. Generally, the feedback from the employees was that the health screenings were more detailed and comprehensive than they had expected:

> They [researchers] helped me understand exactly what the measurements meant, because it is one thing just telling me your BMI is this much without telling me what it means in real terms … It gives you the basics about where you are, what you can improve, what might be an issue. So, it was a nice sensible level of information.

Feedback with regards to the output of the body composition analyser was extremely positive, with some participants reporting their surprise at the variety and quality of information it provided:

> It was quite relaxing and also quite interesting … When he did the hydration bit where you walk around with your socks off, that was the extra part really, it was something I did not expect, I did not think you could measure that kind of thing … I thought, wow! That was a life changer for me as well because I have been drinking more water.

Theme 2: intervention education

The interviewees discussed the large amounts of information available explaining the beneficial impact of regular physical activity and exercise on health. With this in mind, participants reported the intervention did not really provide them with any significant new information about the health effects of physical activity. However, the intervention did highlight the number of activities individuals were doing:

> What it has done has made me a bit more conscious about being active and doing more walking … I was getting 5000 steps a day but now I am getting off two stops earlier at the train and walking in and I make a point of going out at lunch time rather than staying at my desk. So I have got my numbers up to about 9000 now.

However, there were participants who had concerns about their health status raised during health screenings because abnormal levels of blood pressure were discovered. These participants reported the impact it had on their lives as they learned about their health condition:

> The blood pressure, I have got to be honest, and I think just because it was so extreme. I just generally thought some days you are feeling a bit, you know, under pressure and stressed. And I never really thought it would affect my blood pressure, so that was quite a shock to be honest but an understandable shock, because with the way my life was at the time I thought maybe that was an extra factor. So yeah I mean that was interesting for me even though it was not what I wanted to hear. I did have to go on blood pressure tablets eventually.

Employees were encouraged not to focus simply on body weight, but rather to consider other physiological measures as indicators of their health and fitness, such as fat percentage and resting heart rate. Participants reported the intervention demonstrated how effective walking was for their health, and some participants were surprised to experience genuine health benefits from regular walking:

> There were one or two things you do provide that the health centres and hospitals do not. Things like the proportion of fat and muscle so that was quite useful because one of the things I found was that I had put on weight but I have actually lost fat and gained muscle, so the walking is having some effect.

When discussing the impact of the pedometers, participants described how the pedometer increased their awareness of walking activity and step count levels. Some participants were surprised at the number of daily steps they were accumulating:

> I did not realise how low my physical activity was during some days, particularly when I am working really hard, I would just be sitting at a desk and doing very few steps.

In addition to increasing their awareness, participants reported the pedometer was an excellent motivator that encouraged them to increase their step counts whenever possible. Furthermore, having 10,000 steps per day to aim for provided employees with an actual target they could focus on trying to achieve. Participants provided numerous examples of how the

pedometer influenced their activity building behaviours during the day:

> When I made a bit more effort in the day time then it [step count] would be fairly high, almost double the number of steps … it [pedometer] was a great encouragement to make you go out and perhaps take a walk at lunchtime.

Theme 3: impact on health-related behaviours

Participants discussed the effects of the intervention on any health-related behaviours and they reported several changes at work and at home. One of the major outcomes reported was the impact on sitting time at work. Participants stated they began to notice the large amounts of sitting time that was being accumulated at work. This realisation led to changes in physical activity behaviours during work time:

> What I noticed was the routine I had did not allow time for enough walking so I had to change a few things. Like I actually get to work earlier now because I live quite far away and there is no option for walking to work. So I get to work half an hour earlier and go for a 15 minute walk before I start and then a little walk at lunch time.

Many participants reported the intervention made them more aware of the value of incidental physical activity opportunities such as stair climbing. Moreover, the daily step count recommendations acted as a target for them to reach, which focussed their thoughts on doing more walking:

> I am more likely to walk a bit further to the loo or something like that, rather than go to the closest one so you know, it has made me more aware of actually you have got to walk so many steps in a day. You get this mental image that 10,000 steps is something you should be aiming for in a day so the encouragement is there to try and reach that target.

Interviewees also discussed the positive social impact of the intervention at work because, in some teams where there were a number of employees participating, individuals started to compare daily step count figures and introduced a more competitive element between themselves. Furthermore, one example provided by a participating line manager highlighted improved team communication:

> If I am working at a call centre, instead of finding a desk and sitting down and answering my emails and using the phone, I will actually just walk round the site so I get to speak to people face to face which I think is a better way to communicate with people anyway. And then I am more visual, I am more available, I am more approachable to my members.

Some participants reported that the intervention increased other leisure-time physical activity behaviours, such as cycling and running. Others suggested they did not feel a need to participate in additional vigorous type activities because walking was already having a beneficial impact on their health:

> I feel like I do not have to go do energetic physical exercise. I do not feel like I ought to go for a run, because I am walking … because actually I do not particularly enjoy running.

Most participants reported the intervention did not have a major impact on their nutrition because they did not smoke, their alcohol intake was reasonable and they felt their diet was sensible. A few participants reported becoming more aware of the poor aspects of their diet and implementing changes that they thought would benefit them:

> I have stopped eating things like cakes and chocolate, and I did not eat many crisps before but I do not eat any now, I have really just replaced them … I have completely stopped eating chocolate, and I have replaced it with fruit, so that is where the main changes have taken place.

In terms of home life, several participants reported the intervention had a significant impact on the activity levels of other family members, such as spouses and children, who would regularly join the participant for a walk:

> My wife is now keen to try and join me … we try to do an evening walk, so we will go out for about a mile and a half every evening for a nice long walk. We find that relaxing between us, a chance to chat, away from the home environment anything is good.

Participants even reported investing in additional pedometers for their family members so that step counts could be recorded together and everybody had something to motivate them:

> I bought my husband one [pedometer], and my mother one, and my husband and I are like in competition now! And my mother was finding she was not doing very many steps … but then one day she wore it to a Well Woman clinic at the local GP surgery, and she walked there and she walked back, and she got 7000 steps, and when she told them what she was doing she got a big pat on the back and told to keep going!

Theme 4: individual developments

Participants reported experiencing clear physiological improvements after losing significant amounts of weight during the intervention period:

> Well I really feel it and those who also know me say that I look much fitter than I used to be a few months ago … and they are quite surprised by it and when they ask I just say its walking … Because I lost 6 kg in the last 6 months so yes I really feel different.

As well as improvements in weight and body shape, participants discussed how the increase in walking made them feel healthier and fitter:

> My knees used to play up a lot, I used to get a lot more cramp on my calves and it felt like there was no movement in my joints. But it feels like they are a lot more flexible now. My knee joints feel like I can walk and walk and keep walking. Before I used to struggle a lot, so it is helpful.

In addition to physiological benefits, some participants highlighted the psychological benefits they experienced from increasing their levels of walking. Participants reported they generally felt more relaxed and less stressed after some level of activity, and they discussed how this impacted on their work performance:

> I feel more relaxed. I find the walk, or being out of the office, very relaxing rather than just sitting down, eating and thinking … It is quite nice when you go for a walk because you are able to think things through … Walking at lunch time just sort of makes you feel a bit more upbeat and more mentally agile I would say, in the afternoons.

Theme 5: intervention feedback

The employees were asked for feedback about the activity themes that were included in the intervention (e.g. stair climbing, Walking Lunch, etc.), including the themed posters that were sent via email. The emails acted as reminders to inform staff of the activities taking place in the work site and the interviewees stated that receiving the emails made them feel part of a larger programme, which encouraged them to continue:

> One of the posters I did print out and put up near our little block of desks, as a reminder for me and others who are taking part … it was the one that told you how many steps were related to a sedentary lifestyle, an active lifestyle.

Participants highlighted that they felt the frequency of the emails was appropriate, and they often arrived at a time when the enthusiasm to continue was at a low point. Therefore, receiving an email with activity information increased motivation and inspired participants to be more active:

> I think the reminder emails are about the right frequency … I think it was good to every now and again get that little prompt that said this is a good idea because as I could have predicted that I did start to tail off in terms of what I was trying to do, then I would get another email which would prompt me to start again.

Participants discussed how useful the posters were at giving them information that would alter their behaviours. They also highlighted that there is a lot of information already available about health behaviours, so the best posters were those that contained facts and figures where each individual could compare to their own lifestyles:

> I thought it was quite good where for example they explained this many steps equates to the number of calories that you get from a slice of bread and things like that, you really start thinking before you eat something. It also talked about going up and down stairs and like I said sometimes I go from the basement to the 13th floor just to burn some calories.

Some participants reported that they did not always open and view every poster that was emailed to them. This was because the information posters were sent as attached Portable Document Format (.pdf) files and employees did not have enough time to open and read these files. Participants suggested that if the information was embedded in the email, they were more likely to read it. Other interviewees suggested the information should have also been available on the intervention website to improve access. This would also increase the variety of content on the website:

> The way that we currently use coms inside the company is almost like a newspaper but with headlines, and then if you want the information you click through, and you actually go onto a website … What I found, is that whenever I get something, no matter where it is from, if it comes in kind of an attachment … I do not read it with as much attention.

Participants also reported they wanted variety and more detailed outputs from the intervention website, with step count information viewable in graphs that could be edited to view weekly, monthly or even quarterly results:

> It [website] gives you your average, but over the entire period of walking so far and it would be helpful to have a 3 month rolling average, or a monthly rolling average. Because I started very low, it brings it right down … Also, if the [actual] average figure was given, those people who were below average might think, "I will just do a bit more and then I can be average", and then the average would go up.

Discussion

The purpose of this process evaluation was to identify aspects of the Walking Works Wonders intervention that participants found useful and effective to help them change their health-related behaviours. The study also aimed to highlight aspects of the intervention which could be used to inform future workplace health interventions. This study adds to the growing body of evidence that the workplace is an important arena for targeting effective health interventions. Large numbers of people can be targeted via workplace interventions and research shows that work is now a major contributor to sedentary behaviour (Kazi et al. 2014). The workplace could be considered a primary setting in the fight to combat chronic health problems caused by sedentary job roles and increased sitting times (Straker and Mathiassen 2009; Haslam 2017; Jones, Haslam, and Haslam 2017).

One of the key findings was that the results of the health screening assessments had a significant impact on participants' lifestyle and activity behaviours. The results demonstrated the health screenings provided outputs that motivated employees to change their behaviours. Even before any intervention material was delivered, the baseline health screening assessment provided participants with feedback about their health status. This is an important finding because intervention studies often discuss the process of the intervention and assume any outputs were a result of the intervention itself. In this research, the health screening assessments were data collection methods for the researchers at the various time-points. However, participants in the control intervention group also provided data through health screenings, and the results presented by Haslam et al. (2018) did not demonstrate many positive changes in this group. This demonstrates that despite participants' perceptions about the health screenings in this process evaluation, the actual physical activity intervention and promotion materials may have made the difference between the intervention groups. Nevertheless, the health screening assessments could be a good motivational tool to provide the initial stimulus for behaviour change, whereas the actual intervention and associated materials can provide the information required for action.

Despite the widely available information on physical activity and its related health benefits, employees were still surprised to experience such significant health benefits from simply increasing their walking levels. Walking is an activity that is accessible to most people and provides a low level of risk to individuals (Hootman 2007). The biggest impact on actual behaviours from this intervention was an increase in incidental type activity behaviours. The premise of the intervention was not to stimulate people into vigorous activities but rather to encourage employees to think about the time they spent being sedentary and to break this time up with more physical activity. Even though some employees increased activities such as running and cycling, most individuals focussed on increasing walking activities and reducing sedentary time. Therefore, focussing on the incidental accumulation of walking behaviours allows for a more sustainable lifestyle change that may be more effective in the long-term. Furthermore, interventions that promote walking require no training and no special equipment, which means the distribution of information material can safely target large numbers of people.

The results demonstrate that the intervention increased participants' awareness of the amount of time they were sedentary at work. The findings also support the use of pedometers as motivators of physical activity. Participants were previously unaware of how inactive they were, and individuals needed to be shown their levels of inactivity in order to stimulate a change. The findings from this study suggest that given the target recommendation of 10,000 steps per day, the pedometers provided a way for individuals to measure their step counts and motivated them to reach those targets.

The present study has provided an insight into the important features of an activity intervention. The website enabled large numbers of employees to engage in the intervention and online interventions are more cost-effective than printed materials when targeting large numbers of people. However, information available via these electronic methods should be tailored and offer participants detailed feedback. Participants reported the level of information received was of a high quality which was important to secure their engagement. Some participants made changes to their diet even though the focus of the intervention was physical activity. The impact of the intervention spread beyond the workplace as participants involved their spouses and families in activity behaviours outside of work hours. Some participants reported improved communication with colleagues and some enjoyed the competition between colleagues with regards to daily step counts. During work time, breaks that included time for walking resulted in participants feeling more relaxed, and in some instances helped to solve work-related problems.

A strength of this research was that it provided an opportunity for an in-depth investigation into the experiences of employees who participated in the intervention research. A limitation relates to the self-selected nature of the sample. It is reasonable to assume employees who nominated themselves to participate were those who were fully engaged with the research and saw positive health improvements during the course of the intervention. Participants who saw little or no improvements may have not requested to participate in an interview. Furthermore, the interviews were only carried out with individuals who returned for the additional health screening assessments, as this was part of the recruitment process for this phase of the research. Obtaining feedback from participants who did not return may have added a useful component to this evaluation.

The interviews were offered to all participants in the standard and staged intervention groups. They were not offered to participants in the control group because they did not receive intervention material. However, it may have been interesting to see if the health screening assessments had any impact on participants' lifestyle and compare differences between the intervention groups. In addition, feedbacks from both the standard and staged intervention groups were not separated because the intervention schedule and material they received was essentially the same. The only difference between the groups was the original activity information delivered to each participant at the beginning of the intervention, which was tailored according to their stage of change.

The study provides insight into the key elements that employees found helpful when participating in a workplace intervention designed to reduce sedentary behaviour and improve health at work. Employees reported an increased awareness of sedentary time, proactive monitoring of activity using pedometers and behavioural changes to accumulate more steps and increase walking levels. Participants also reported improved physiological and psychological health outcomes, improved relations with colleagues, changes in dietary behaviour and involving their families in physical activity. The study has highlighted areas that may help inform future interventions targeted at the sedentary workforce. Sedentary behaviour represents a major public health issue and the discipline of Ergonomics is well placed to tackle this challenge by investigating how jobs and workplaces can be designed to integrate physical activity and promote healthy and sustainable work in a rapidly changing workplace.

In a rapidly changing world, with times of global economic uncertainty, investments in workplace health promotion may not be a high priority for industry. Mucci et al. (2016) conducted a systematic review exploring the relationship between the 2007–2008 economic crisis and health, which showed that economic crisis was an important stressor that had a negative impact on workers' health. Giorgi et al. (2015) examined the impact of fear of the economic crisis on mental health. Through structural equation modelling, the authors found that social support and job stress mediated the relationship between fear of economic crisis and employee health. These studies clearly demonstrate that workers' health is negatively impacted during periods of economic uncertainty. In a rapidly changing world, effective workplace health initiatives are more important than ever to counteract such negative effects and to promote worker engagement and sustainable healthy working.

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