

Walking for Wellbeing in the Community: evaluating the transfer into practice of a research-led walking intervention.

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Abstract

Background: Given the well established health benefits of attaining regular physical activity and the low take-up of such across the adult population of developing nations, a research priority is developing feasible and measurable strategies for supporting individuals to increase their activity levels to at least meet the level recommended to be beneficial to health. In Scotland and the wider United Kingdom, increasing attention has been placed on health inequalities in recent years, therefore such strategies must be concerned with achieving effectiveness across the population.

Introduction: Moving from simply testing efficacy to also assessing effectiveness of a public health intervention presents new challenges to researchers. Walking for Wellbeing represents the latest phase in the development of a physical activity intervention which consists of pedometer, graduated walking programme and physical activity consultation. This phase is concerned with implementing the intervention among six community and workplace groups and evaluating the potential for fuller translation into practice.

Methods: A mixed-methods approach was developed to provide data on a variety of outcome and process measures.

Results: Adherence to the evaluation of the intervention was encouraging for a pilot, given that the evaluative side placed more demand on participants than the intervention itself if implemented alone would have. Over half of the programme participants ranked in the most deprived quintile of the Scottish Index of Multiple Deprivation. Mean increases in step-count in intervention group in comparison to the control was just short of the 3000/steps/day target. Participants reported many benefits of the programme with the overriding barrier to implementation and adherence being technical functionality and usability considerations with regard to the pedometer model used.

Conclusions: Walking for Wellbeing can achieve significant increases in walking activity among inactive adults, including those within traditionally hard to reach populations. Implementation of this intervention is feasible and worthwhile in various settings. Development of an improved pedometer model, ideally with functionality tailored to the requirements of the intervention, would increase adherence, and enhance the viability of implementation in more settings, allowing the benefits of the programme to be obtained by an increased proportion of the population.

Author Biographies

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Chris has a background in community research and development working on projects aimed at fostering more beneficial uses of urban greenspace and woodland. For the past year he has been tasked with investigating the potential for *Walking for Wellbeing* to be translated into practice among community and workplace groups.

Chloe McAdam

Chloe is SPARColl's Project Coordinator. She has a PhD in Medical Sociology from the University of Glasgow. SPARColl's main research focuses on increasing physical activity levels via walking based interventions. Chloe has a particular research interest in how features of neighbourhoods may help people to achieve a physically active lifestyle.

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Claire is a Lecturer in Human Movement Sciences in the School of Psychological Sciences and Health at the University of Strathclyde and Assistant Director of SPARColl.

Having completed a PhD in the measurement of cardiorespiratory fitness in frail, older adults she has a particular interest in the activity levels of older people.

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Nanette is Professor of Exercise and Sport Psychology at the University of Strathclyde and is also a Visiting Professor at the Medical Research Council's Social and Public Health Sciences Unit. Nanette is Director of SPARColl and has varied research interests within the realm of physical activity, particularly it's effects on mental health.

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Introduction

The link between poor health and lack of attainment of physical activity at the population level is well established (O'Donovan et al., 2010, Warburton et al., 2006). In recent years the true extent of widening health inequalities drawn along geographic and socio-economic lines, as well as the difficulties faced in tackling these, has also become apparent (Shaw et al., 2005). It is vital therefore that the research agenda be concerned with meeting the challenge of identifying feasible and measurable strategies and interventions that support individuals throughout the population to increase their physical activity levels. Central to this objective is the successful translation of research findings into widespread real world practice (Eakin et al., 2005).

The development of any public health intervention from conception through to widespread implementation requires progression through a developmental continuum comprising distinct stages of development and refinement of the intervention. This has been conceptualised as a framework in the most recent Medical Research Council Guidance on the Development and Evaluation of Complex Interventions, which also stresses the necessity of including *process* alongside *outcome* measures in evaluating interventions, and by others such as in Nutbeam's Stages of Research and Evaluation for Public Health Interventions (Craig et al., 2008, Nutbeam and Boxall, 2008)

The latest physical activity policy document from the UK Government's Department for Health *Let's Get Moving- A New Physical Activity Care Pathway for the NHS*, advocates a primary care based intervention that draws on motivational interviewing to influence behaviour change (Bull and Milton, 2010). A detailed process evaluation was undertaken on trials of the intervention that were conducted in six GP practices in London. Thus, the importance of feasibility testing, in informing the nationwide rollout of the programme, is emphasised. The difficulty of assessing the true impact of community based interventions when delivery groups have limited resources is highlighted in the five year review of Scotland's national Physical Activity Strategy - *Let's Make Scotland more Active – Five Year Review* (NHS Health Scotland, 2009). It is clear that there is an important role for academics to fulfil in supporting the evaluation of community based interventions, as well as developing the evidence that informs their design. Indeed the necessity of this role is only heightened when considering those interventions that have the potential to reach deepest and most ubiquitously into the population.

Walking for Wellbeing (WfW) is an evidence based intervention, that includes as a component, physical activity consultations, which while distinct from and intended for use with individuals further along the spectrum of exercise contemplation, are somewhat akin to motivational interviews. Walking has long been regarded as the most accessible form of physical activity and small bouts of walking of between 30 – 60 minutes duration are most likely to be successful in

enticing a greater proportion of inactive individuals to become active (Ogilvie et al., 2007, Hillsdon et al., 1995). WfW is currently at an earlier stage of development to Let's Get Moving and the present study investigates the feasibility of implementing the programme in community settings.

WfW indeed represents the latest stage in the development of a walking programme intervention and builds on previous work undertaken by the Scottish Physical Activity Research Collaboration (SPARColl) that included the early problem definition and intervention design phases – essentially these were informed by a systematic review – followed by a Randomised Control Trial (Ogilvie et al., 2007, Fitzsimons et al., 2008). The RCT was known as Walking for Wellbeing in the West to reflect the geographical location, in the west of Glasgow, of the community from which the sample population participating in it were drawn. Results from the RCT included a mean increase in step-count of 2600 and significant changes in mood/positive affect at 12 weeks (Baker et al., 2008a).

This latest phase of development, identified as WfW, has identified different real world contexts for implementation and evaluation of the intervention. A range of data collection techniques have been undertaken within a multi-method approach which will provide qualitative as well as quantitative information. Analysis will then allow the researchers to determine not only the outcomes of the intervention in the new settings, but also provide an understanding of challenges and barriers to, as well as facilitators of, implementation. These will include feasibility and process aspects as well as external factors affecting participant adherence and logistical delivery considerations.

The RIPPLE study team as posited by Oakley and colleagues who argue that inclusion of process evaluation measures within RCT's can improve the science of research into Public Health Interventions (Oakley et al., 2006). Achieving the synthesis of developing delivery plans concurrent with rigorous evaluation, and attempting therefore, to bridge the gap between delivery in community settings and academia as we are attempting to achieve in this case, is certainly not without challenges. Further heightening the challenging nature of the present study is the targeted nature of recruitment that has been guided towards engaging with individuals considered to be the more relatively deprived of society. As there is particular interest in gauging any effect implementation of an intervention may have on inequalities, and a prominent agenda in Scotland, and indeed the rest of the UK, of attempting to minimise rather than widen such inequalities, the value and justification of making efforts to reach out to underserved communities – where health and wellbeing indicators compare unfavourably with national averages – with this phase of the intervention's development is obvious (Smith, 2007, Harrington et al., 2009). Various authors such as Trayers & Lawlor and Shaw *et al*, raise concerns with regard to the reach of an intervention often contributing to a widening of inequalities in cases in which recruitment typically doesn't succeed in engaging with those communities who experience greater social distance and are traditionally hard to reach (Trayers and Lawlor, 2007, Shaw et al., 2005).

This paper presents the rationale, study design and some preliminary findings of the WfW phase, examining the strategy for progression along the developmental continuum into a phase concerned with replication and dissemination, moving indeed, towards potential widespread implementation of the intervention. Occurrence of studies focussing on this phase of development are less frequent in the literature on physical activity promotion, though it is argued could be of the greatest impact in terms of translating research findings into practice (Campbell et al., 2000). A study on the implementation of a programme named Fit for Life Steps that worked in underprivileged communities in the rural Mississippi delta area assessed the viability of using Community Based Participatory Research methods in assessing the implementation of a six month duration walking intervention among a targeted population of African American Women. A key recommendation arising from this work is that investment of time in relationship and capacity building between university, government and community partners is of paramount importance with regards to the success or otherwise of this approach (Zoellner et al., 2007).

At this stage in the development of WfW the research team have engaged with 6 targeted community based delivery partners. In order to meet the challenge of adequately resourcing the implementation as well as achieving meaningful evaluation, a variety of qualitative measures that inform a rigorous and detailed *process evaluation* have been devised and are applied in addition to some outcome measures, reduced in number from those that were used in the preceding RCT.

Process evaluation is highlighted by several authors as being of immense importance in measuring effectiveness of interventions and providing insight as to factors that mitigate or catalyse success or failure of the intended impact, be they factors that are intrinsic or extrinsic to the intervention itself. It is theorised that by investing time and resources in process evaluation, and moving on from looking primarily for a definitive yes or no answer regarding the efficacy of an intervention, successful impacts can be furthered and greater value and return on investment can ultimately be obtained (Campbell et al., 2000). It is difficult to ascertain a clear definition for process evaluation as it is by nature responsive to any given field or type of intervention in which it is utilised. In the case of this study it is useful to think of it as 'a set of activities directed at assessing progress in program implementation' (Steckler and Linnan, 2002). In particular it is broadly concerned with identifying; issues that affect participant's adherence to the intervention, considerations for resources and logistics of implementation, quality of materials produced, model fidelity and differences in delivery of the intervention between sites.

The RE-Aim framework provides further guidance on producing robust findings from evaluation measures when seeking to navigate the path between research and practice (Glasgow et al., 1999). It is recommended as a template for investigation and presentation of findings in attempting to progress from efficacy to effectiveness research as is the case in the present study (Glasgow et al., 2003). Each of the headings within the framework; Reach, Effectiveness, Adoption, Implementation and Maintenance, are paid heed to within each distinct phase or specific study undertaken as development progresses along the continuum as well as in an overarching sense throughout the whole process of developing and translating an intervention such as WWW/WfW into practice.

Aim

To move from testing simply the efficacy, to assessing the effectiveness of the Walking for Wellbeing intervention in real world settings. To provide learning and insight as to facilitators and barriers to implementation, both intrinsic and extrinsic to the intervention.

Methods

Components of the Intervention

Participants in groups assigned to the maximal intervention received a 30 minute physical activity consultation. The transtheoretical model of behaviour change was used as a theoretical framework for the consultation and followed recommended guidelines. This consultation focused on uptake of physical activity, discussion of barriers and formation of goals incorporating the walking programme. It is akin to a traditional motivational interview although in this case more deliberation will be focused on walking and it is entered into on the premise that the recipient has already entered at least the contemplation stage on the transtheoretical model (Lowther et al., 2002). This approach has previously been used to show successful physical activity behaviour change (Kirk et al., 2004). Ordinarily it has been delivered on a one-to-one basis by a trained professional. In this case it is being delivered by each group's gatekeeper, where feasible, or by another individual trained by SPARColl. As part of this study SPARColl have devised and delivered bespoke training to 15 individuals. Another aspect in which the consultations in this community based study have differed from the norm is that they have been delivered in group settings. A major element of the evaluation will focus on determining the effectiveness of these consultations and understanding how realistic it is to expect beneficial outcomes when delivered in practice in this manner.

Each participant was also given an individualised 12 week walking programme and a pedometer. The aim of the walking programme was for participants to increase their average daily step count by 3,000 steps above their baseline value on at least five days of the week by week 6 and maintain this to week 12. The 3,000 steps value is based on the assumption that an adult walking at a moderate pace takes 100 steps/minute (1,000 steps/10 minutes). An increase of 3,000 steps/day would correspond to an increase of approximately 30 minutes of moderate physical activity, i.e. the physical activity recommendation for adults. A graduated approach comprising stepped targets is used to build towards the ultimate aim of attaining an increase of 3000 steps on 5 days of the week (Table 1).

Table 1/ Weekly Goals in the Walking for Wellbeing Intervention

Time-point	Goal
Week 1	To walk an extra 1,500 steps (from baseline value) on at least 3 days of the week
Week 2	To walk an extra 1,500 steps (from baseline value) on at least 3 days of the week
Week 3	To walk an extra 1,500 steps (from baseline value) on at least 5 days of the week
Week 4	To walk an extra 1,500 steps (from baseline value) on at least 5 days of the week
Week 5	To walk an extra 3,000 steps (from baseline value) on at least 3 days of the week
Week 6	To walk an extra 3,000 steps (from baseline value) on at least 3 days of the week
Week 7	To walk an extra 3,000 steps (from baseline value) on at least 5 days of the week
Week 8	To walk an extra 3,000 steps (from baseline value) on at least 5 days of the week
Weeks 9–12	To maintain walking levels using the week 7 goal

Participants in groups assigned to the minimal intervention received only the 12-week walking programme and pedometer at baseline. Groups assigned to No.3 - 12 week waiting list were requested not to amend their current physical activity levels. At 12-weeks all three groups had received the full maximal intervention by delivering the component/s that those in cohorts 2 and 3 had not yet received.

The average daily baseline step-count of each participant was calculated by wearing a pedometer for 6 days, which included at least one weekend day, and calculating the average

Recruitment Process

A total of six walking groups were recruited to the core intervention. Three were community based groups and three workplace based. It was decided that it was within the scope of the present study to investigate the intervention's processes within these two broadly distinct environments.

Recruitment of participant groups was undertaken between September and December 2009. To this end the lead researcher produced publicity information which was used to raise the profile of WfW through relevant conferences and newsletters. Of importance in the early stages was engagement with key stakeholders at national and regional levels who advertised the opportunity to take part through their networks and provided advice. Direct contact was then made with individual groups and relationships developed with a key contact/gatekeeper in each. By attending one of the weekly walks held by each group the lead researcher, in tandem with each gatekeeper, then assessed the disposition of the majority of the group to the idea of taking part in the WfW intervention. With cognition of the health inequalities agenda the final decision on which of the candidate groups would take part was based on selecting those who were based in locations that fell within a data zone that registered within the most deprived quintile on the Scottish Index of Multiple Deprivation (SIMD). The SIMD is the official measure of relative area based deprivation in Scotland and is based on 37 deprivation indicators across 7 domains: current income, employment, housing, health, education, skills and training, and geographical access to services and telecommunications. These measures are used to split the country into data zones of between 500 and 1000 people, which are then ranked from the most deprived (1) to least deprived (6505) on the overall SIMD index.

Study Design and Randomisation

The study follows a stepped wedge approach to the intervention. The stepped wedge design allows control variables to be compared whilst ensuring that all participants have had the opportunity to receive the full intervention during the study (Brown and Lilford, 2006). Each of the six groups were randomly assigned to one of three cohort arms as follows:-

- Waiting list control - usual practice for 12 weeks followed by maximal intervention.
- Minimal intervention - pedometers and walking programme for 12 weeks. Receive Physical Activity Consultation at 12 weeks.
- Maximal intervention - pedometers and walking programme for 12 weeks plus Physical Activity Consultation at baseline.

Randomisation was carried out by group with one community group and one workplace group allocated to of the above cohorts. Randomisation was not feasible at the individual level since the nature of implementation was through working with groups.

Evaluation Methodology

Outcome Measures

- *6-day step count.*
Mean daily step-count was measured over 6 days at baseline, with follow-up at 12 weeks and 24 weeks. Participants wore a sealed pedometer at baseline and 24 weeks. 12-week data for the maximal and minimal cohorts will, in effect, be provided as a by-product of the intervention itself as participants will be monitoring their step-counts at this stage. The waiting list control group wore sealed pedometers at this stage as they embark on the intervention proper.
- *Questionnaire booklet.*
The questionnaire booklet is composed of 2 questionnaires based on elements of the approach inherent in the Transtheoretical Model of behaviour change; Stage of Change (Loughlan and Mutrie, 1995) and Self-efficacy (Marcus et al., 1992). Mood is assessed using the Positive and Negative Affect Schedule (PANAS) (Watson et al., 1988). Self-report physical activity over the previous 7 days is assessed using the International Physical Activity Questionnaire (IPAQ) (Craig et al., 2003). The questionnaire booklet will be applied at the same intervals as the step-count measures are taken i.e. baseline, 12-weeks and 24-weeks. Demographic Data will also be captured.

Demographic Data

Included within the initial questionnaire booklet are questions that ask participants to share information including their date of birth, gender, postcode and estimated annual household income. Collecting postcode data allows the each participant's neighbourhood to be placed on the Scottish Index of Multiple Deprivation. Collecting household income data enabled the research team to monitor how typical or reflective of their postcode area individual project participants are in relation to their position on the SIMD range. This allows assessment of the reach into target demographic groups of this implementation of WfW.

Evaluation of Intervention Processes

- *Step-count diaries including open-ended questions.*
Completion was optional in that non-completion did not result in exclusion from continued participation in the study but participants were asked to submit the diaries to the research team upon completion of the 12-week programme. As well as any responses given to the open ended questions, the rate of apparent use of the diaries in itself provided evidence as to the usefulness of these as part of the intervention. They are not a necessary component of the intervention itself since participants could conceivably complete the intervention by visually monitoring their step-counts rather than keeping written records of it.
- *Video recording and expert appraisal of selection of Physical Activity Consultations.*
This allowed assessment of the viability of the training and transferability of knowledge in delivery of PA Consultations that has been provided to gatekeepers by SPARColl. Group consultations, which are more feasible in the real world settings, have been delivered

whereas in WWW one-to-one consultations were used. Examination of the video's by the research team and independent experts allows appraisal of delivery in this format. Revised consultation pro-formas and materials have been generated for this purpose by the lead researcher. This evaluative method has provided learning as to any improvements that could be made in this newly evolved method of delivery of PA consultations..

- *Semi-structured (walking) interviews at weeks 3 and 9.*
A researcher visited participant groups and undertook interviews in conversation with project participants. Depending on local factors these either took place whilst the group were engaged on a led walk or indoors. They were typically carried out on a one-to-one basis but on occasion two or three participants were spoken to as part of the same recorded conversation.
- *Intervention Processes Monitoring Form.*
The lead researcher kept a simple record of the various inputs and which agent enacted each input in each of the six settings where the intervention was implemented. To some degree this varied from setting to setting. This record will is then extended by adding a new column in which is input suggestions for which agent could most feasibly take responsibility in future, more widespread implementation. This is useful as in this phase of the development of the intervention there will be a number of actions and resources that are provided by SPARColl. It is envisaged that in future rollout some of these actions and resources would need to be provided by participant groups themselves and some from alternative sources.
- *Post-Intervention Focus Group Workshop with gatekeepers and stakeholders.*
This workshop took the format of a group discussion with a view to gaining more detailed feedback from group facilitators on issues regarding further future rollout of the intervention. Much of the content of this workshop revolved around exploration of themes that have arisen from earlier research phases. Through open discussion participants are invited to verify, clarify or expand on some of the key findings with which they were presented.
- *Research Diary/ Field Notes.*
This was formed from a simple note of contacts, references and rationale behind decisions made at key stages and enabled, for example, the project team to identify and monitor key partnerships in the delivery of the project. It was completed electronically by a researcher, updated periodically and securely stored on a PC.

Summary of Key Findings

Participant Demographics

The six groups (3 community based, 3 workplace based) comprised a total of 47 participants (Table 2). The vast majority, 43 in total, were female, which is generally reflective of the typical make up of walking for health groups. The project successfully engaged with a wide age range of participants 22 yrs to 79 yrs $M=45$, $SD 13$. Over half of the participants, 56%, were drawn from the most deprived quintile of the SIMD. The community groups provided over three quarters of such participants, 22 individuals, compared with 5 from the workplace groups.

Table 2/ Participant No. and SIMD Ranking

	No. of Programme Participants	No. of Programme Participants in Most Deprived SIMD Quintile
Community Groups	27	22
Workplace Groups	20	5
Total	47	27

Of the 47 participants who embarked on the programme at the outset a total of 22, just under half, provided data at the 12-week stage. A breakdown of these in terms of workplace or community setting and SIMD ranking is provided in Table 3.

Table 3/ Participant Adherence

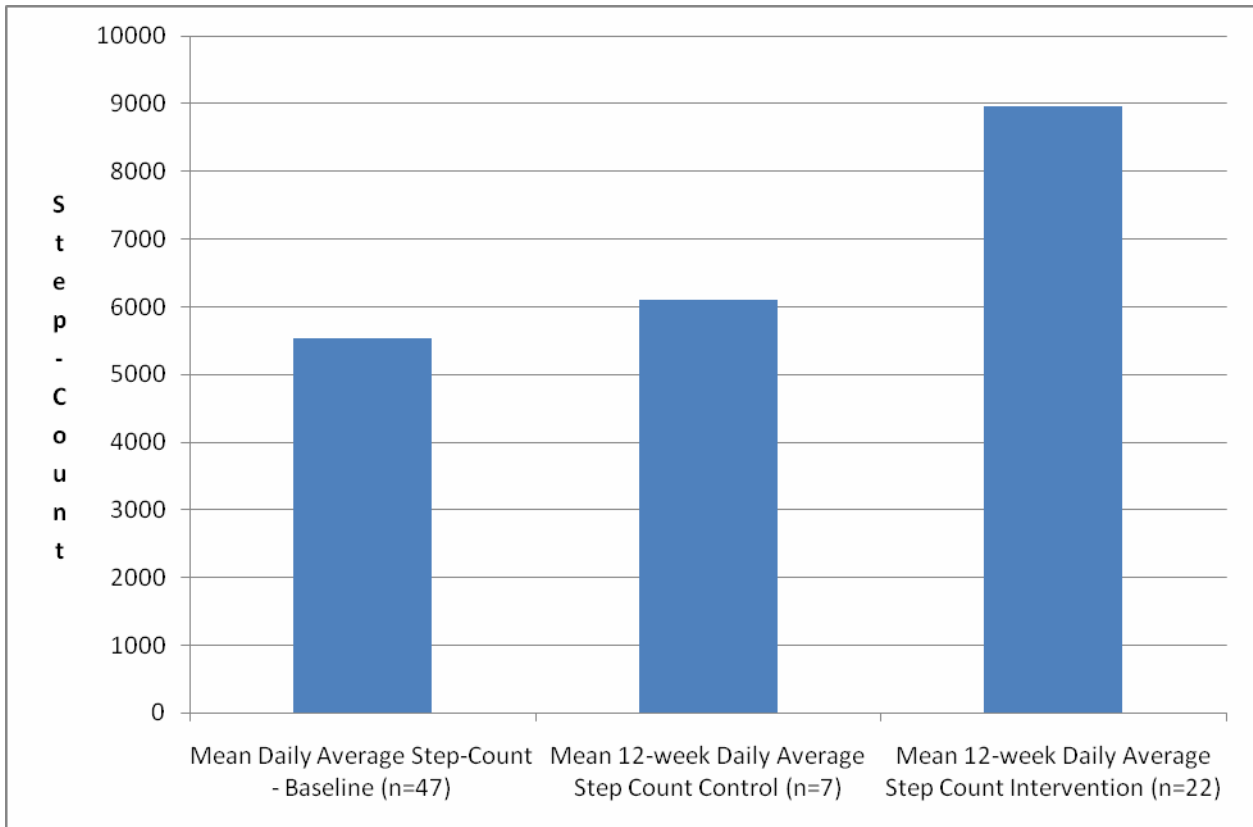
	No. of Participants Recorded at Completion of 12-week Programme	No. at 12-weeks from most Deprived SIMD Quintile
Community Groups	11	9
Workplace Groups	11	4
Total	22	13

Step-Count Data

The project managed to attract a largely inactive, in terms of baseline step-count, cohort of participants. This was encouraging given the project was unable to specifically target such a population in terms of exclusion criteria. As the primary goal of the study was evaluation of processes of implementation this meant that pre-existing walking groups were engaged with at the group level rather than individuals.

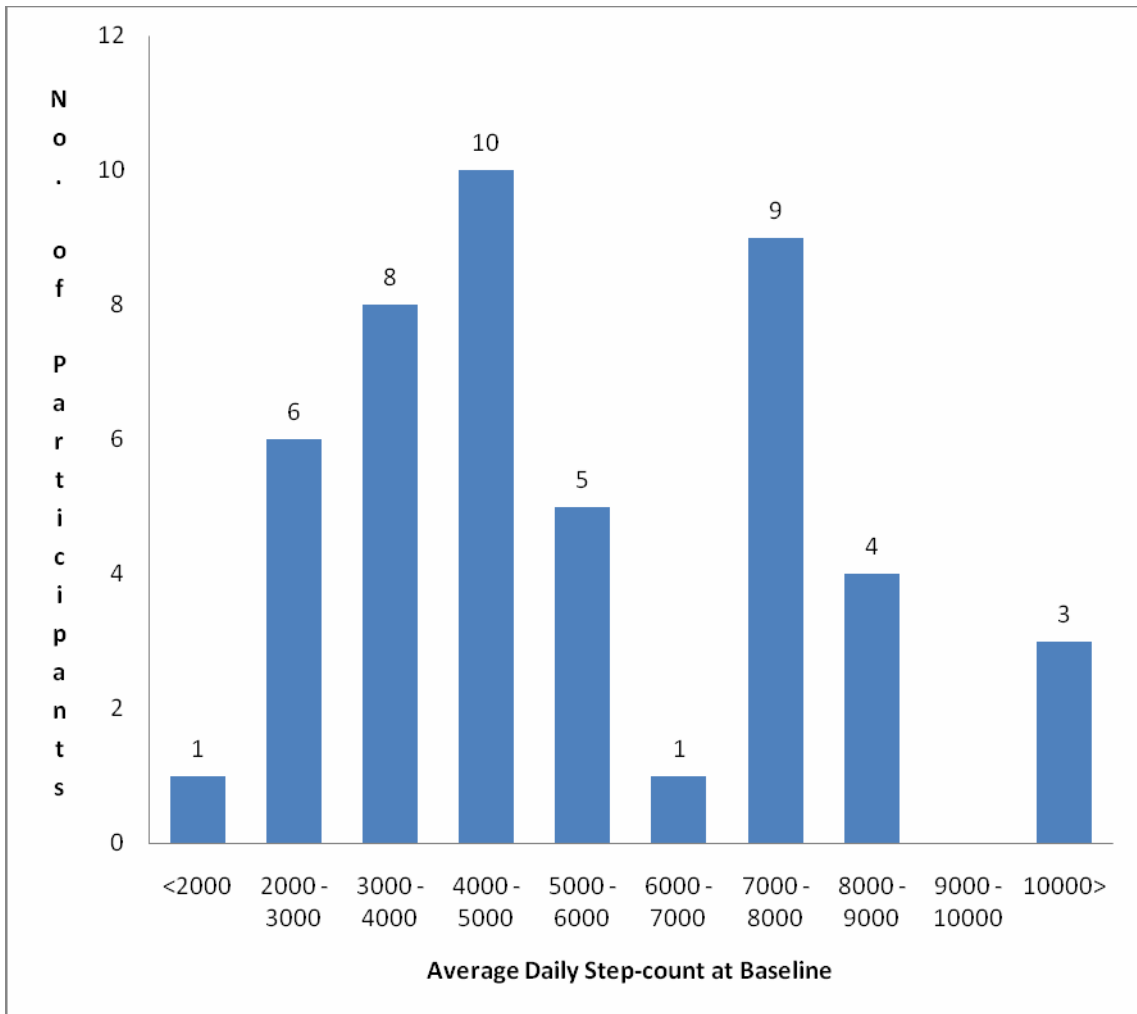
The mean daily average baseline step-count for the 47 participants initially engaged with was 5527, which would be considered to be inactive (Tudor-Locke C. and Bassett Jr. D.R., 2004). Of the 22 participants who completed the 12-week programme the mean daily average step-count at baseline was slightly higher at 5839. In comparison to the 12-week control group (n=7) the mean increase among these participants at 12-weeks was significantly greater by 2861 steps/day, just short of the 3000 steps/day target (Figure 1). This suggests that for those participants who completed the programme the intervention was successful in meeting its goals

Figure 1/ Mean Daily Average Step-counts Baseline & 12 week follow-up Control vs. Intervention



The mean increase in step-count recorded between baseline and project completion is reflected in histograms displaying participant distribution in terms of their average daily step-counts at baseline and 12-weeks (Figures 2-4).

Figure 2/ Participants Step-count Distribution at Baseline



The distribution pattern of average daily step-counts at baseline for completing participants, i.e. the 22 participants who provided data at the 12 week stage, is displayed in Figure 3. Figure 4 displays how this distribution has changed at the 12-week stage upon programme completion.

Figure 3/ Completing Participants Step-count Distribution at Baseline

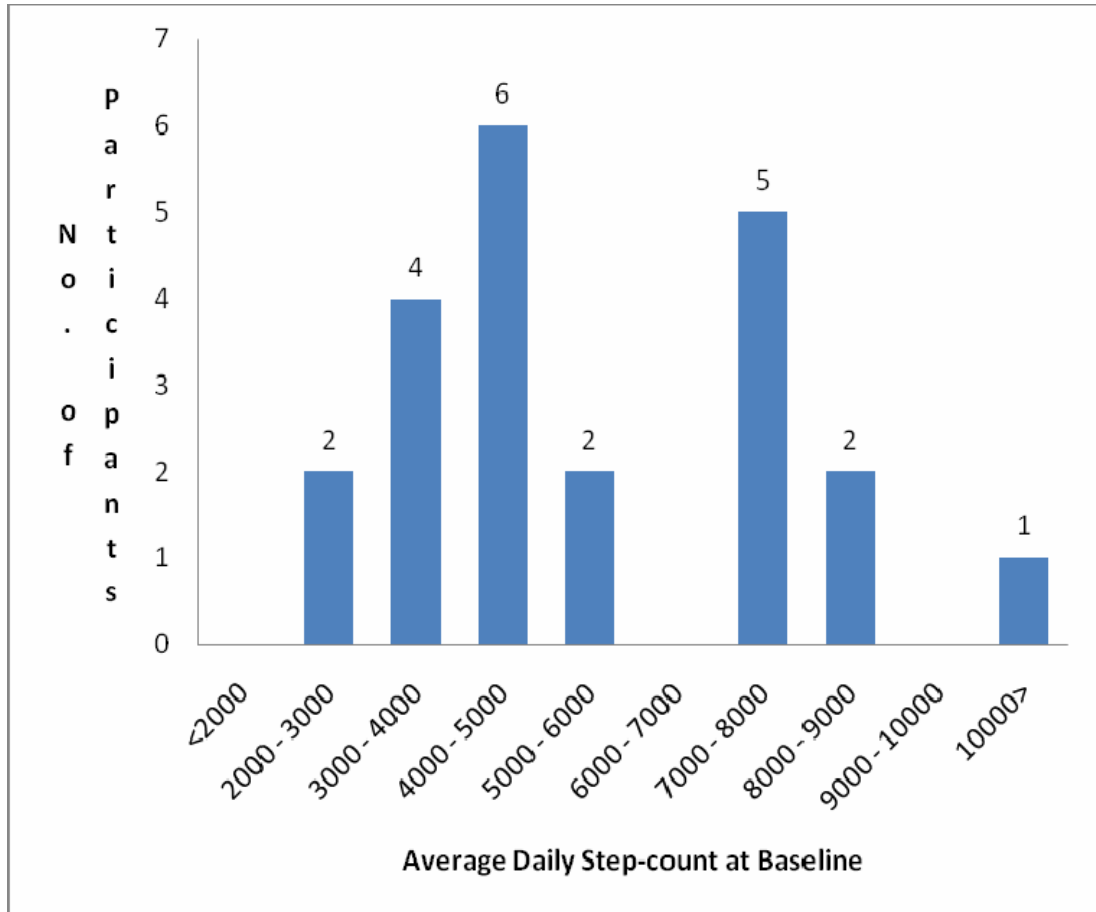
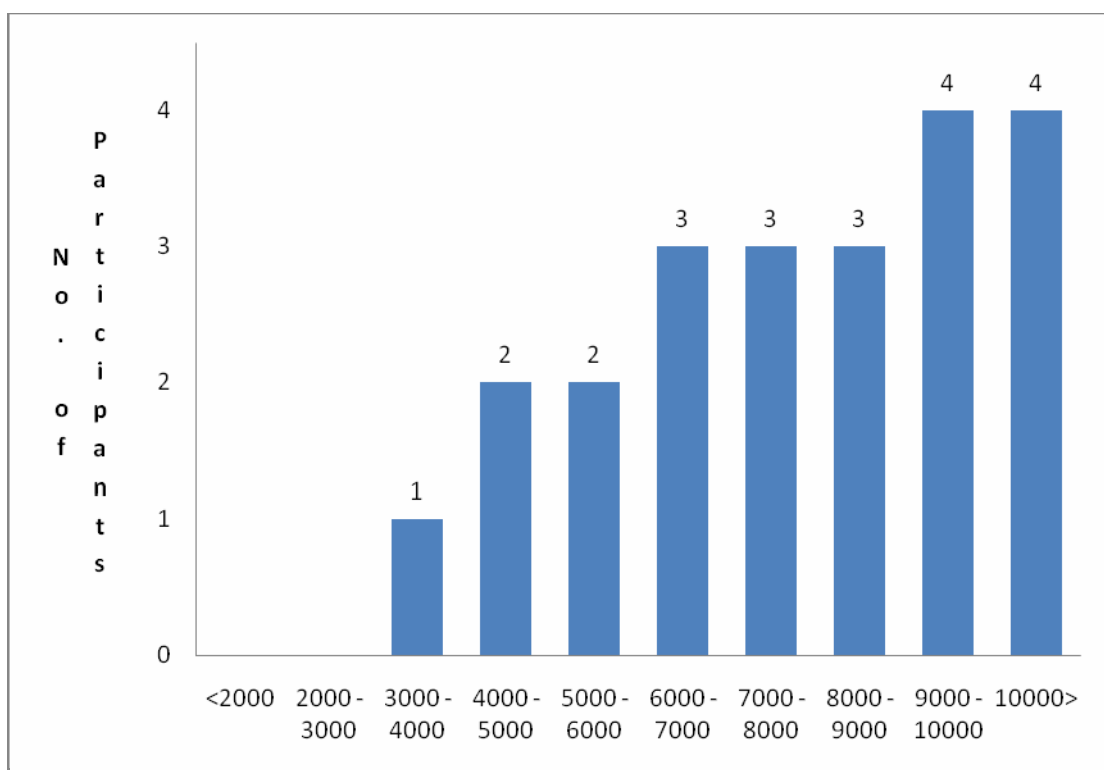


Figure 4/ Completing Participants Step-count Distribution at 12-weeks



Affect (PANAS)

A significant impact on positive affect was found between baseline and the 12-week stage. A paired t-test found a significant increase in positive affect for those participants completing the 12-week programme baseline ($M = 29.41$ $SD = 8.7$ ($n=22$), 12-weeks $M = 33.61$ $SD = 7.4$ ($n=22$) $p = 0.0007$. This corroborates results from the original RCT (Baker et al., 2008a).

Most Common Participant Perceived Facilitators of Intervention

A strong theme emerging from the range of qualitative data gathered recognises the value of pedometers as a motivational tool. Many of the participants who successfully completed the programme found the novelty of recording their step-counts and using the pedometers as a visual cue, on a daily basis, helpful in facilitating their adherence to the intervention. Some typical quotes are provided below. This corroborates much evidence already in existence in the literature which indicates pedometers can be a useful tool as a component of an intervention (Baker et al., 2008b, Bassett et al., 2000).

"Yeah, it's been good. Some days I am doing more steps, now, but I'm not actually going out of my way to do more steps – it just kind of happens.....It's interesting to see how much more I can do on a day."

"wearing the pedometer all the time made me very conscious of how much walking that I was doing, and maybe I wasn't doing as much as what the wee targets were suggesting, but I was still consciously making an effort to do a bit more."

"It's become quite addictive – how many steps have I done so far? You know, open it up and having a look."

"I was quite surprised at how little I was actually doing at the beginning. I would have thought I was doing more. So that was a bit of an eye opener."

Some participants reported social support as being important in helping them adhere to the programme. This transpired in two distinct forms, either support and encouragement from family and friends who would become interested in the individuals participation in the programme...

"I've got my kids involved in it, my brother, my nephew, nieces – whenever we're out, they always go, 'Have you got your pedometer on?' Make sure when we're walking yeah."

"We went a walk down the old burn, I hadn't been down there since I was wee, so it was really nice and moving actually, I wasn't expecting that I'd just never have thought of going back down there if I wasn't doing this programme"

"We go to the duck pond with the children to feed the ducks, walk up to Sainsbury's if it's, you know, just a few things to buy..... you know, instead of the car, we walk."

or within participant groups who would find that they enjoyed talking amongst themselves and comparing and contrasting each others progress. This was more prevalent within the workplace

groups, who spent more together as a group, as they worked together every day rather than the community groups who typically would meet weekly, as exemplified by the following comment.

"we all have a great laugh in here egging each other on and checking how much each other is doing. That's a great benefit I think it helps keep us going with it"

Most Common Participant Perceived Challenges to Intervention Effectiveness

The overriding barrier to successful implementation that must be addressed in order to facilitate successful future rollout is technical considerations with regard to the pedometers usability and functionality. A plethora of comments regarding this was put forth by several participants both those dropping out of the programme and some who completed it.

"I had a couple of problems with the pedometer, and it didn't register – and there was one day, it had been a public holiday, and I had been out with my family and I'd walked for miles – but at the end of the day, it said a hundred and twenty odd steps or something, and I thought I was going to start crying because I knew I'd walked loads and loads – and I think that had kind of disillusioned me. But a few times, sort of things like that had happened and it kind of put me off a wee bit."

"One second it's two thousand and the next second it's three thousand five hundred – so something was wrong with that."

"I noticed, one day, I had been out in my car, and it clocked up something like ten thousand steps and I had been driving"

"But things like going with my husband to the golf course and just walking round with him and things like that – I was absolutely gutted last week when I came back and went, opened my pedometer to see how many steps I'd done and it was just blank. I don't know if the battery had ran out in it or whatever, so I was gutted."

Interviewer: Has the little battery symbol been flashing before that, had you noticed?

I hadn't noticed it flash, no."

"It just died and that whole day, I had worked hard and I went like that, I was raging..... I was going to sling it. I was raging."

Conclusions

It is clear that the Walking for Wellbeing programme can bring benefits to individuals who are pre-motivated to increase their physical activity levels. Implementation can be effective in both workplace and community settings and amongst previously inactive individuals, and those from traditionally hard to reach populations. The learning from this evaluation will be useful in facilitating future implementation and encouraging the investment of resources necessary for optimal rollout.

Before any future implementation is undertaken overriding consideration must be given to options that could lead to a more reliable pedometer model being sourced or developed as a complementary feature of the intervention. Development of an improved pedometer model, ideally with functionality tailored to the requirements of the intervention, would increase adherence, and enhance the viability of implementation in more settings, allowing the benefits of the programme to be obtained by an increased proportion of the population.

Analysis of process measure data is ongoing alongside that of 24-week outcome measures. Itemised lists of actions/resources necessary for publication and suggested agents as potential enactors of these will be produced alongside cost/benefit analyses. Fuller results will be submitted for publication in academic journals in due course. Specific dissemination materials will also be distributed directly to stakeholders in the field by early 2011. (Bull and Milton, 2010)

References

- BAKER, G., GRAY, S., WRIGHT, A., FITZSIMONS, C., NIMMO, M., LOWRY, R., MUTRIE, N. & COLLABORATION, T. S. P. A. R. 2008a. The effect of a pedometer-based community walking intervention "Walking for Wellbeing in the West" on physical activity levels and health outcomes: a 12-week randomized controlled trial. *International Journal of Behavioral Nutrition and Physical Activity*, 5, 44.
- BAKER, G., MUTRIE, N. & LOWRY, R. 2008b. Using pedometers as motivational tools: are goals set in steps more effective than goals set in minutes for increasing walking? *International Journal of Health Promotion and Education*, 46, 21 - 26.
- BASSETT, D., CURETON, A. & AINSWORTH, B. 2000. Measurement of daily walking distance-questionnaire versus pedometer. *Medicine & Science in Sports & Exercise*, 32, 1018 - 1023.
- BROWN, C. & LILFORD, R. 2006. The stepped wedge trial design: a systematic review. *BMC Medical Research Methodology*, 6, 54.
- BULL, F. C. & MILTON, K. E. 2010. A process evaluation of a "physical activity pathway" in the primary care setting. *BMC Public Health* 10, 463.
- CAMPBELL, M., FITZPATRICK, R., HAINES, A., KINMONTH, A. L., SANDERCOCK, P., SPIEGELHALTER, D. & TYRER, P. 2000. Framework for design and evaluation of complex interventions to improve health. *BMJ*, 321, 694-696.
- CRAIG, C., MARSHALL, A., SJOSTROM, M., BAUMAN, A., BOOTH, M., AINSWORTH, B., PRATT, M., EKELUND, U., YNGVE, A., SALLIS, J., OJA, P., GROUP, I., RELIABILITY, I. & GROUP, V. S. 2003. International Physical Activity Questionnaire (IPAQ). *Med Sci Sports Exerc*, 35, 1382 - 1395.
- CRAIG, P., DIEPPE, P., MACINTYRE, S., MICHIE, S., NAZARETH, I. & PETTICREW, M. 2008. Developing and evaluating complex interventions: the new Medical Research Council guidance. *BMJ*, 337.
- EAKIN, E. G., SMITH, B. J. & BAUMAN, A. E. 2005. Evaluating the Population Health Impact of Physical Activity Interventions in Primary Care—Are We Asking the Right Questions? *Journal of Physical Activity and Health*, 2, 197-215.
- FITZSIMONS, C., BAKER, G., WRIGHT, A., NIMMO, M., WARD THOMPSON, C., LOWRY, R., MILLINGTON, C., SHAW, R., FENWICK, E., OGILVIE, D., INCHLEY, J., FOSTER, C. & MUTRIE, N. 2008. The 'Walking for Wellbeing in the West' randomised controlled trial of a pedometer-based walking programme in combination with physical activity consultation with 12 month follow-up: rationale and study design. *BMC Public Health*, 8, 259.
- GLASGOW, R., VOGT, T. & BOLES, S. 1999. Evaluating the public health impact of health promotion interventions: The RE-AIM framework. *American Journal of Public Health*, 89, 1322 - 1327.
- GLASGOW, R. E., LICHTENSTEIN, E. & MARCUS, A. C. 2003. Why Don't We See More Translation of Health Promotion Research to Practice? Rethinking the Efficacy-to-Effectiveness Transition. *Am J Public Health*, 93, 1261-1267.
- HARRINGTON, B. E., SMITH, K. E., HUNTER, D. J., MARKS, L., BLACKMAN, T. J., MCKEE, L., GREENE, A., ELLIOTT, E. & WILLIAMS, G. H. 2009. Health inequalities in England, Scotland and Wales: Stakeholders' accounts and policy compared. *Public Health*, 123, e24-e28.
- HILLSDON, M., THOROGOOD, M., ANTISS, T. & MORRIS, J. 1995. Randomised controlled trials of physical activity promotion in free living populations: a review. *Journal of Epidemiology and Community Health*, 49, 448-453.
- KIRK, A., MUTRIE, N., MACINTYRE, P. & FISHER, M. 2004. Effects of a 12-month physical activity counselling intervention on glycaemic control and on the status of cardiovascular risk factors in people with Type 2 diabetes. *Diabetologia*, 47, 821 - 832.

- LOUGHLAN, C. & MUTRIE, N. 1995. Recruitment of sedentary NHS staff for a workplace exercise programme using an adapted stages of change exercise questionnaire. *Journal of Sports Sciences*, 13, 63 - 64.
- LOWTHER, M., MUTRIE, N. & SCOTT, E. 2002. Promoting physical activity in a socially and economically deprived community: a 12 month randomized control trial of fitness assessment and exercise consultation. *Journal of Sports Science*, 20, 577 - 588.
- MARCUS, B., BANSPACH, S., LEFEBVRE, R., ROSSI, J., CARLETON, R. & ABRAMS, D. 1992. Using the stages of change model to increase the adoption of physical activity among community participants. *American Journal of Health Promotion*, 6, 424 - 429.
- NHS HEALTH SCOTLAND 2009. Five-year review of 'Let's Make Scotland More Active' – A strategy for physical activity. NHS Health Scotland.
- NUTBEAM, D. & BOXALL, A. M. 2008. What influences the transfer of research into health policy and practice? Observations from England and Australia. *Public Health*, 122, 747-753.
- O'DONOVAN, G., BLAZEVIICH, A. J., BOREHAM, C., COOPER, A. R., CRANK, H., EKELUND, U., FOX, K. R., GATELY, P., GILES-CORTI, B., GILL, J. M. R., HAMER, M., MCDERMOTT, I., MURPHY, M., MUTRIE, N., REILLY, J. J., SAXTON, J. M. & STAMATAKIS, E. 2010. The ABC of Physical Activity for Health: A consensus statement from the British Association of Sport and Exercise Sciences. *Journal of Sports Sciences*, 28, 573 - 591.
- OAKLEY, A., STRANGE, V., BONELL, C., ALLEN, E. & STEPHENSON, J. 2006. Process evaluation in randomised controlled trials of complex interventions. *BMJ*, 332, 413-416.
- OGILVIE, D., FOSTER, C. E., ROTHNIE, H., CAVILL, N., HAMILTON, V., FITZSIMONS, C. F. & MUTRIE, N. 2007. Interventions to promote walking: systematic review. *BMJ*, 334, 1204.
- SHAW, M., SMITH, G. D. & DORLING, D. 2005. Health inequalities and New Labour: how the promises compare with real progress. *BMJ*, 330, 1016-1021.
- SMITH, K. E. 2007. Health inequalities in Scotland and England: the contrasting journeys of ideas from research into policy. *Social Science & Medicine*, 64, 1438-1449.
- STECKLER, A. & LINNAN, L. 2002. *Process Evaluation for Public Health Interventions and Research.*, San Francisco, CA, Jossey-Bass.
- TRAYERS, T. & LAWLOR, D. A. 2007. Bridging the gap in health inequalities with the help of health trainers: a realistic task in hostile environments? A short report for debate. *Journal of Public Health*, 29, 218-221.
- TUDOR-LOCKE C. & BASSET JR. D.R. 2004. How Many Steps/Day Are Enough?: Preliminary Pedometer Indices for Public Health. *Sports Medicine*, 34, 1-8.
- WARBURTON, D. E. R., NICOL, C. W. & BREDIN, S. S. D. 2006. Health benefits of physical activity: the evidence. *CMAJ*, 174, 801-809.
- WATSON, D., CLARKA, L. & TELLEGEN, A. 1988. Development and validation of brief measures of positive and negative affect: the PANAS Scales. *Journal of Personality and Social Psychology*, 54, 1063 - 1070.
- ZOELLNER, J., CONNELL, C. L., SANTELL, R., FUNGWE, T., STRICKLAND, E., AVIS-WILLIAMS, A., YADRICK, K., LOFTON, K., ROWSER, M., POWERS, A., LUCAS, G. & BOGLE, M. L. 2007. Fit for Life Steps: Results of a Community Walking Intervention in the Rural Mississippi Delta. *Progress in Community Health Partnerships: Research, Education, and Action* 1, 49-60.