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**Step Challenge: The Use of Pedometers & Dietary Advice on the Activity  
and Fitness Level of a Group of Adults with a Learning Disability**

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## **Step Challenge: ‘The Use of Pedometers and Dietary Advice on the Activity and Fitness Level of a Group of Adults with a Learning Disability’**

Jessica Adams, Marian Emly

### **Abstract**

Eight service-users who were regular gym attendees were identified to participate in this project. Baseline fitness assessments were completed and pedometers issued. Individualised dietary advice was offered and accepted by six participants. Data recording of number of daily steps of each participant was completed over eight-nine weeks with regular rewards handed out for achievement and effort. Fitness assessments were repeated at five and nine weeks.

### **Results**

Average weight loss = 2.9 kg  
Average waist measurement loss = 1.9”  
Average baseline weekly number of steps = 14,606  
A 57% increase of steps from week 1 to week 8-9.

### **Conclusions**

The audit has demonstrated the value of using a pedometer to increase activity levels outside the gym with this population. The positive changes seen in fitness assessment figures correlate with the use of the pedometer. The results of the combination of increase in physical activity with dietary advice are inconclusive.

### **Recommendations**

- Continued use of pedometers with a support network and reward system.
- A body fat percentage calculation as an additional baseline assessment figure.
- A longer audit for dietary changes to be fully implemented.

**Keywords:** Pedometer, Learning Disability, Fitness, Obesity, Activity

The Leeds Physiotherapy Service for People with Learning Disability set up a weekly physiotherapy-run gym fitness session at a local leisure centre in 2002. This self-referral provision attempted to address the problem of health inequalities and barriers to physical activity experienced by adults with a learning disability in Leeds. Each attendee was allowed a settling-in period to learn about the gym equipment, and how to use it safely. During this period each attendee completed a baseline fitness assessment. An individual fitness programme was devised for each participant and monitored by the Physiotherapist leading the sessions.

A 6 month audit of the gym fitness programme conducted in 2006 showed the value of exercise and targeted nutritional advice for this population. Based on

these recommendations, it was decided to conduct a further audit in 2007 looking at the use of pedometers and dietary advice on the level of activity and fitness in a group of adults who regularly attended the fitness sessions at the local leisure centre.

## **Background**

The Healthcare Commission (2005) highlighted recent research conducted at the University of Lancaster around healthcare inequalities and inconsistencies for people with learning disability. People with a learning disability are at a higher risk of obesity, eat less well and take less exercise than the general population. The Disability Rights Commission (2006) published figures from a health survey in Wales, identifying that 35% of people with learning disability are obese compared with 22% of the general population.

The positive effects of exercise on cardio-respiratory fitness, levels of obesity and mental health are well documented. Kyle et al (2004) found that physical activity is able to limit weight gain and fat mass in both men and women. Melzer et al. (2004) reported that regular activity has an impact on lowering blood pressure.

A systematic review by Penado and Dahn (2005) examined a prospective observational study highlighting the effects of physical activity on systolic blood pressure reducing the risks of diabetes-related complications and death with type 2 Diabetes, a common disease amongst learning disability individuals. It additionally highlighted the evidence on physical activity preventing the development of type 2 Diabetes. They also reported on the positive effects of physical activity to improve mood and reduce symptoms of depression and anxiety.

The Department of Health (2005) has recommended a physical activity plan ('Choosing Health: making healthy choices easier, 2005') for everyone to promote health.

However, people with learning disability experience barriers to physical activity, including transport needs, staff support ratios, financial resources and unclear policy guidelines for day and residential day services (Messent et al., 1998a, 1998b, 1999). These barriers impact negatively on general fitness and obesity levels.

## **Context**

In order to instigate change in cardio-respiratory fitness and obesity in people with learning disabilities, it is first necessary to identify the physical activity levels in their day-to-day life. The 2006 audit recommended the use of a pedometer; a tool that measures the amount of steps you take, to achieve this end.

'Walking the way to health' (Walking the Way to Health (WHI) 2008) suggests the use of a pedometer as a way to capture the daily number of steps completed, hence the amount of physical activity undertaken by a participant. Walking, particularly, is a more useful measure to capture activity in the learning disability population compared to the general population due to the barriers learning disabled adults face with other activities such as running and cycling.

Promoting walking as a simple way to increase physical activity is outlined in 'Healthy Weight, Healthy lives: A Cross-Government strategy for England' (Cross-Government Obesity Unit, Department of Health and Department of Children, Schools and Families, 2008). The 'Walking into Health' campaign is aiming to get a third of England walking at least 1,000 more steps daily by 2012.

The British Heart Foundation has further recommended 10,000 steps to increase fitness levels (BHF, 2007). Tudor-Locke and Bassett (2004) report that older people and those living with chronic conditions only take 3,500-5,500 a day. This was important to remember when identifying daily targets for the participants with learning disability.

Using a pedometer to measure baseline activity has been evidenced by numerous studies. A systematic review published in 2007 'Using Pedometers to Increase Physical Activity and Improve Health' (Bravata et al, 2007) suggested the use of a pedometer is associated with significant increases in physical activity and significant decreases in body mass index and blood pressure.

### **Aims and Objectives**

The audit sought to assess and measure the following for a learning disability group:

- The value of using a pedometer to increase activity levels outside the gym.
- Any changes in fitness assessment figures as a result of the use of the pedometer and increases in activity levels.
- The value of specialist dietary advice alongside the use of the pedometer in improving fitness assessment figures.

### **Method**

This was a small sample, within a time limited project which was used to assess the value of pedometer use and specialist dietary advice with adults with learning disability.

In October 2007, eight service-users who were ambulant regular gym fitness attendees were identified to participate in this project.

They were identified as the people:-

- Least likely to lose the pedometer.
- Most likely to co-operate (to want to take part).
- In need of changes to be made to activity levels/fitness assessment figures.

One participant had hypothyroidism and was taking thyroxin which had not resulted in any weight loss prior to the start of the challenge. One participant had insulin-dependent diabetes and three other participants suffered with asthma. See Table 1 for participant profile.

**Table 1 – Participant Profile**

Part'ant	Sex	Age	Initial weight (Kg)	Dietary Goal	Support Network	Day service
1	Female	45	81	Current diet acceptable	Lives in group home	No
2	Female	36	86	Dietary advice not accepted	Lives with carer	Yes
3	Female	58	49	Dietary advice not accepted	Lives with sister	No
4	Male	57	115	Ensure portions of starchy carbs the same size each day	Lives alone	Yes
5	Female	43	80	Switch to semi-skimmed milk. Swap sandwich at supper for fruit	Lives with Mum and Sister	Yes
6	Female	29	111.6	Current diet acceptable	Lives in group home	Yes
7	Female	37	98	Daily breakfast. Drink more fluids. Swap sugar drinks for diet versions.	Lives alone	No
8	Female	45	68	Current diet acceptable	Lives in group home	Yes

Baseline fitness assessments were completed on all participants as part of the 1<sup>st</sup> Phase of preparation. The fitness measurements used were weight (Kg), BMI, Waist measurement (Inches), Blood pressure, resting respiratory rate and resting heart rate. This phase of preparation was completed in four weeks and also included:

- A reward system devised of certificates, keyrings, pens, flasks and medals to encourage compliance with the project.
- A contract signed by Home Carers and Day Service staff who agreed to support the service-user with the daily use of the pedometer and accurate daily recording of number of steps. This was done by completing home visits and/or day centre visits showing the equipment/rewards and paperwork.
- The provision of a T-shirt for all service users to show they were part of the challenge.
- All participants were asked at the home visit if they would like dietetic input as part of the project. Six participants agreed and were given a food diary to record their dietary intake in one week.

The 2<sup>nd</sup> Phase involved the issue of the pedometers on their attendance to the gym over a two-week period. Pedometers were attached to the participant via an elastic band that fitted around their waist to ensure the pedometers did not fall off. Waist measurements of participants were taken at the initial home visit.

The data recording of baseline number of steps of each service-user/participant was then completed over a two-week period where weekly targets were set.

Completed food diaries were passed onto the Dietician who then visited each of the six participants at home to complete an assessment and set a dietary goal as appropriate. This was completed over a two-week period.

During the initial three-week period, activity levels of each participant outside the gym fitness session were identified. Advice was issued as to where activity levels could be increased.

Fitness assessments were completed again at five weeks and nine weeks. A celebratory gathering where prizes were distributed for successful increases in levels of activity took place after all results were gathered.

## Concerns

Our initial concerns for the success of the challenge were as follows:-

- Possibility of losing Pedometer
- Forgetting to put the Pedometer on each morning and to record the total at night and then remembering to reset it
- Ability to position the pedometer to record accurately the number of steps being taken
- Non-attendance at the gym to monitor the participant
- Christmas fell in the middle of the project therefore we anticipated decreased compliance/decreased physical activity and increased calorie intake.

## Results

Of the eight participants, one was lost to non-attendance and one to other circumstances. Of the remaining six, the average weight loss was 2.9 kg. The average waist measurement loss was 1.9". The average baseline weekly number of steps was 14,606. The average final week number of steps was 22,929.

**Table 2 - Fitness Assessment Results**

Participant	Weight Loss (KG)	Waist measurement loss (inches)	Other fitness measurement improvement	Weekly average of number of steps at week 8-9
1	5	3"	Blood pressure down from 146/88 to 119/82	29,210
2	6	0"	Resting HR down 13 BPM	31,212
3	1	2"	Respiratory rate down 2 breaths per minute	37,172
4	1	3½"	Nil	11,065
5	1	2"	Nil	13,309
6	2.6	1"	Nil	15,610

## Discussion

There was a 57% increase in the number of steps from week one to week eight-nine. This could be attributed to the high level of participant compliance with the pedometer use, which the reward system may have directly contributed to. Additionally, over the eight-nine week period the accuracy of the recording seemed to improve.

The two participants with the most weight loss completed a high weekly average of number of steps compared to other participants. However an active participant

with the highest weekly average number of steps lost the least weight recorded in line with three other people who also lost 1kg. This individual in order to have increased her weight loss may have benefited from an increased target for her weekly steps. What is encouraging, however, is that everyone lost weight regardless of the amount.

This audit used a small sample size. Participants had different levels of home support to encourage and ensure accurate recording. Participants had different levels of self-motivation.

The accuracy of the recording is questionable in two ways:

- It is known that the pedometer is not 100% accurate
- Human error may play a part in documenting the daily number of steps

However, it is likely that any errors in these measurements would be normally distributed and therefore would not adversely affect the overall measure of trend.

The initial plan was to set a daily target but it was apparent after the first week that a daily target was unrealistic as the levels of activity on each day varied dramatically, especially when comparing the weekend to Monday to Friday. Therefore a weekly target was set which was a more realistic goal.

With Christmas and New Year falling in the middle of the project there was a significant drop in activity on the bank holidays. This will therefore have slightly decreased the average number of steps compared to other weeks.

Two participants who attended the same Day Service were unable to include any more activity in their weekly timetables. This was due to staffing and participant reluctance to change their routines. This could have decreased their potential to complete more steps and improve their fitness assessment figures. However, their timetable already included three physical activity-based sessions a week which could be argued is realistic in this participant group.

The level of similarity between each participant makes it difficult to establish the ideal number of weekly steps required to achieve a positive outcome for this group of people.

Receiving the rewards had a positive outcome on the participants' compliance with the challenge. Lifestyle changes occur when a person is either internally or externally motivated. It is recommended that a person identifies an internal motivator to be successful (Crogan, 2005). The reward system targeted the internal motivator of the participants.

## **Conclusions**

The audit has demonstrated the value of using a pedometer to increase activity levels outside the gym. One prime example is participant 2 who lost the most weight and instigated her own lifestyle change by walking instead of getting the bus to three places she visits on a weekly basis. She was so pleased with her success that she asked to continue to use the pedometer on her own. There was a marked increase in the average number of steps taken in week one compared to week eight-nine.



The audit has demonstrated changes in fitness assessment figures as a result of the use of the pedometer and increases in activity levels. The significant changes seen in fitness assessment figures correlate with the use of the pedometer. When analysing fitness assessments that were completed up to two-three years before the project started, it is clear that there were no significant changes in weight until the project started. However, different assessors using the standardised fitness assessment form could have introduced a degree of variability.

The true value of specialist dietary advice alongside the use of the pedometer in improving fitness assessment figures is unclear. The participant with the most weight loss did not accept any dietary advice. However, she may have already made dietary changes or her carer did not believe her dietary intake needed changing.

The two participants who lost the most inches off their waists (one of which also had significant weight loss) did accept dietary advice. Dietary changes often take time to implement and as this was only a short intervention the audit may not show a true picture of the influence dietary changes could have on fitness assessment figures.

There was occasional inconsistency with daily recording on the charts which may have been because the participants had forgotten to put the pedometer on and/or record it/reset it. It was highlighted by a Day Service in the first week that participants were not wearing the pedometers appropriately and a visit was made to rectify this situation. One initial concern was proved wrong when none of the participants lost their pedometer.

The support of home carers and Day Service staff enabled six participants to complete the project. The two participants who lived alone were the least successful in meeting their weekly step targets. In addition, the correlation between the two participants with the highest weekly average number of steps and the accurate recording of these with the fact they live with a specific carer and not in a group home signifies the importance of 1:1 support when completing a challenge like this.

It is apparent that the rewards were a crucial part of the success of the challenge due to the accomplishment participants appeared/reported to feel when they received a certificate or other reward. The enthusiasm of participant 2 to continue this without any rewards is also a key point. This could illustrate that we have improved the understanding of the importance of physical activity in order to be healthy in some of our subjects.

## **Recommendations**

1. The use of pedometers with people with learning disability is a useful tool to increase fitness levels and may be an aid to weight loss.
2. It is essential to have a strong support network for any individual with a learning disability provided with a pedometer in order to maintain compliance and motivation with the Step Challenge.
3. A reward system will maintain high levels of compliance and motivation with the use of the pedometer.

4. The use of the calculation of body fat percentage could be a valuable baseline assessment figure to use.
5. A longer audit to allow dietary changes to be implemented and monitored would also be recommended.
6. As a result of the findings of this audit, an obesity/lifestyle care pathway is being developed in Leeds for people with learning disabilities.

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