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Medway Working Age Group (MWAG) & Exercise Project

Progress Report 28.04.2017

Introduction

The Parkinson's Disease (PD) exercise class that was set-up at St Mary's Island Community Centre (SMICC) was a joint venture between The Medway Working Age Group and the School of Sport and Exercise Sciences (SSES) at the University of Kent, with the help of grant funding from Parkinson's Equip (PE). The first session took place on 04.10.2016, so the venture has been running for just over 6 months. Initially there were 15 participants who were tested on a number of health and functional parameters, with additional measures performed before the end of 2016. There are now 24 names on the class list of people with PD, some who reside beyond the geographical boundaries of Medway. The session is supervised by Dr Steve Meadows, a lecturer from SSES and Roisin Sullivan, who is a pulmonary and stroke rehabilitation professional, and recent graduate from SSES. Assistance during the session is provided by current undergraduate and postgraduate students from a variety of courses run by SSES, who volunteer to help at the session. This has provided a rather unique situation where there is a high ratio of instructor / assistant instructors to participant ratio (approximately 1:2). This does fluctuate on a weekly basis, depending on attendance by participants and availability of volunteers, but regular attendance by volunteers is encouraged to promote rapport with class participants and a team approach to session delivery. The session is currently running at capacity for the physical space - officially a waiting list is now in operation. Recruitment and retention have not been an issue (so far). Two participants dropped out due to finding the group environment unsuitable for their personal needs. As can be seen from Figure 1, the general profile has seen a gradual increase in attendance over the last 6 months. The mean attendance each week is 16 participants, but has varied on a range of 9 – 23 participants.

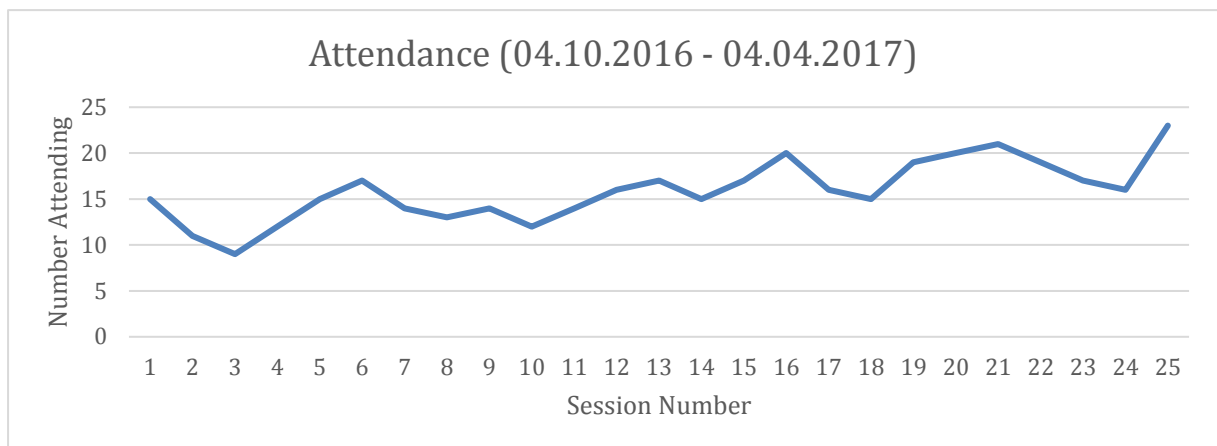


Figure 1. Attendance Profile at SMICC PD Exercise Class

Data Evaluation

As explained in my recent email (20.04.2017) we commenced data collection from session 1. This helps to support SSES involvement and provides a robust means of evaluating the effectiveness of the venture. It also facilitates a contribution to the current debate about the role of exercise in the chronic management of PD, most recently at a workshop organised by Parkinson’s UK in London on 21.04.2017. The key points emphasised in this meeting about the specific recommendations for exercise in PD were:

1. Introduce it early in diagnosis.
2. Intensity sufficient to promote neuroplasticity.
3. Complexity – engage the body and mind in multi-tasking exercise.
4. Rewarding – i.e. enjoyment will promote repetition and adherence.

I had a meeting with the PD nurse at Medway Maritime Hospital before the exercise session commenced, so she is aware of its existence and can refer newly diagnosed patients; combined with the collaboration with MWAG, this covers recommendation 1. The exercises included in the session at SMICC runs from 1830-1930 hours on a Tuesday evening and is a circuit-based session with emphasis on magnitude and speed of movement, multi-limb movement (multi-tasking), use of voice and cognitive challenge in exercise execution. A perceived exertion of effort for the session is reported from each participant at the end to ensure they are working hard enough. This covers recommendation 2 and 3. As far as recommendation 4 is concerned, people vote with their feet – attendance has gradually increased and nobody has been lost due to boredom or disliking the session (see Figure 1).

Table 1 below shows some ‘hard data’ from the health and functional tests performed on participants. We are still trying to complete the third assessment (Measurement #3), so this is not a complete data set, but I hope it gives you an idea of the tangible health benefits. The two ‘Comment’ columns in the table

provide a brief evaluation of the criteria being measured. All values shown are mean group values.

We use standard tests in measurements. The 6-minute Walk Test requires participants to walk as far as they can in 6-minutes, so this provides an indication of walking speed and addresses symptoms like bradykinesia. The Timed Up & Go requires the participant to stand up, walk across a level surface for 3 metres, turn, walk back and sit down. This measures leg strength, balance and speed. 1 Minute Sit-to-stands is the number of repetitions of sit-to-stands that can be performed in 1 minute and measures strength endurance of the leg muscles. Grip strength provides a surrogate measure of upper limb muscle power, but also indicates symmetry between the left and right upper limb.

Table 1. Health & Functional Capacity Data

Criteria	Pre-exercise Measurement #1 (n = 22)	Post-exercise Measurement #2 (n = 20)	Difference #1 & #2	Comment	Post-exercise Measurement #3 (n = 14)	Difference #2 & #3	Comment
Weight (kg)	85.29	81.24	- 4.05	Lost weight	82.59	+ 1.35	Slight gain
BMI (kg.m²)	28.88	28.45	- 0.43	Reduced (ideal < 25)	29.49	+ 1.04	Increased (ideal < 25)
Waist Circumference	98.88*	96.48*	- 2.4	Waist size decreased*	97.42*	+ 0.94	Slight increase*
Systolic Blood Pressure (mmHg)	137.48	124.70	-12.78	Reduced (ideal < 140)	136.21	+ 11.51	Increased (ideal < 140)
Diastolic Blood Pressure (mmHg)	82.04	78.40	- 3.64	Reduced (ideal < 90)	81.29	+ 2.89	Increased (ideal < 90)
Resting Heart Rate (bpm**)	73.87	74.47	+ 0.60	Slight increase (normal range 60 – 80)	73.29	- 1.18	Slight decrease (normal range 60 – 80)
6 Minute Walk Test (m)	426.44	428.35	+1.91	Slight increase – walked further	451.85	+ 23.50	Increased - walked further
Timed Up & Go (secs.)	9.28	7.85	- 1.43	Got quicker	8.59	+ 0.74	Slight decrease – got slower
1-Minute Sit-to-Stand (reps)	19.70	23.00	+ 3.3	Did more repetitions	24.57	+ 1.57	Did more repetitions
Grip Strength (Left) (kg)	31.37	30.95	- 0.42	Slight decrease	27.08	- 3.15	Decreased – losing strength
Grip Strength (Right) (kg)	32.06	31.69	0.37	Slight decrease	27.74	- 3.95	Decreased – losing strength

*healthy waist circumference depends on whether participant is male (<102cm) or female (<88cm)

**bpm = beats per minute

Discussion

Some measurements are subject to natural fluctuation (e.g. weight, blood pressure, and resting heart rate) in any population, but with PD there can be good days and bad days. Generally, we do not test people if they are having a bad day, but if energy levels are low, performance in things like the 6-minute walk test will be compromised. Most of the assessments are performed in the evening, so participants may not be at their physical optimum following a day at work, or performing everyday tasks. Overall, health and performance is being maintained over the last 6 months – which is a positive message for a population with PD. Whilst measurement #3 is still a work in progress (more data collection planned for 2nd May 2017), the general trends in the last 6 months are:

1. systolic and diastolic blood pressures are in normal healthy ranges;
2. ability to perform sit-to-stands is improving;
3. walking speed over 6-minutes is improving;
4. some weight loss could be encouraged to promote a healthier BMI (ideal < 25kg.m²);
5. upper limb muscle power needs to be promoted (grip strength exercises recently introduced to the exercise circuit).

Future Work (The Next 6 months)

Since January 2017 SSES have been running a research project alongside the session collecting blood samples from class participants who voluntarily opt to be a part of this parallel research work. We are investigating blood-derived neurotrophic factor (BDNF) levels in the blood pre- and post-exercise, and also levels across a time period of 3 months. The final samples were collected this week (25.04.2017). An SSES colleague, Dr Glen Davison, who is an immunologist, is now working with the project and he will be conducting the analysis on the blood samples and the perceived exertion values collected from participants at the end of each session in this BDNF project. This will help to inform the association between exercise intensity and chemical changes in the body.

This BDNF project will act as pilot data for further work which we will be planning over the summer in preparation for a PhD student who will be starting with SSES for 3 years from September 2017. The PhD is being funded by a scholarship from the University of Kent. This will extend the work further and provide other opportunities for research work and disseminating information and will certainly help to secure the long-term involvement of the University in the MWAG project.

Future Challenges (> 6 months)

1. Exploring a sustainable funding model to ensure the exercise class venture continues – this will be done in conjunction with MWAG and the Head of School for SSES.
2. Investigating other opportunities for people with PD to engage with exercise.
3. Exercise leadership – identifying suitable candidates from the SSES student community to lead exercise sessions for people with PD in Medway and surrounding areas.

Personal Reflection

From my observations of being involved in this project and running similar clinical exercise sessions, the early success of this project is down to a number of key factors:

1. Generous funding from PE.
2. An enthusiastic local advocate (Phillip Bungay) and working with a local support group / network – it makes recruitment easier.
3. Dedicated professionals to run the session (I am indebted to my colleague Roisin Sullivan for helping to support the venture and using her expertise and experience from stroke rehabilitation in the PD exercise session).
4. Labour resources from SSES students to help supervise the sessions.
5. Evaluation & research – working in partnership with a higher education institute and support from my SSES colleagues.

Final Comments

The funding provided by PE to get the project off the ground, helped secure the PhD scholarship from the University. One of the criteria was to show a track record of attracting funding – PE provided that. This venture has grown from just an exercise class for people with PD. This exercise opportunity continues, but additional research and student work experience opportunities are being built around it, which will, in time further promote an awareness of PD and the role of exercise in PD. Thank you for your early support – it provided the stimulus for so much more.

Please do not hesitate to get in touch if you have any further questions or need clarification on any of the points raised in this report. As mentioned in my last email, I am happy to answer any questions via a conference telephone call, or skype to your board meeting.

Kind regards,

Dr Steve Meadows
Lecturer, SSES, University of Kent.