



Positive Action: the feasibility of using exercise to improve the health of older drug users

Carol Beynon, Amy Luxton, Tim Cable, Peter Angell, Scott Robinson, Liverpool John Moores University.

Mark Gabbay, Lucy Frith, University of Liverpool.

Adrian Taylor, University of Exeter.

Rhiannon Whitaker, Lu Zou, North Wales Organisation for Randomised Trials in Health.

Dave Holland, Sharon Holland.

Background

In Cheshire and Merseyside the number of older drug users (defined as aged 40 and over¹) in drug treatment services has increased from 750 in 1998² to 6,500 in 2010/11 (data available from the Public Health Observatories). These older drug users often experience considerable health challenges including circulatory, liver and lung problems, cancer and mental health conditions.³⁻⁶

Participation in regular moderate physical activity has considerable health benefits⁷ and a review of the literature identified nine studies that had evaluated the use of physical activity as an intervention to improve the health or reduce substance use of drug users.⁸⁻¹⁶ All nine studies reported some positive findings and called for further investigation into the use of exercise as an adjunct to traditional drug treatment. We found no study which evaluated the impact of exercise on the health and wellbeing of older drug users.

The current focus of UK drug policy is recovery and a key element of this is wellbeing.¹⁷ People with a long history of heroin use have often been in and out of treatment many times¹⁴ and so it is useful to consider different ways to improve their health and wellbeing, including through the use of exercise. However, whether older drug users in the UK can be encouraged to participate in physical activity and whether participation brings about any health benefits is currently unknown. The aims of this pilot project were: 1) to ascertain if we could identify 20 older drug users who would be willing to participate in physical activity, and 2) to assess the feasibility of using physical activity as an intervention to improve health and wellbeing. We also aimed to measure changes in health and wellbeing although this was a secondary aim as the study was a pilot with a small sample size.

Methods

Participants and recruitment

Older drug users were recruited through Service User Representatives and key workers at Liverpool Addaction Shared Care service. People were eligible to take part if they were aged over 40 and were actively using illicit drugs and/or were in contact with a drug service. Potential participants received an information sheet and a reply form on which to send their contact details and GP name and address to the research team. The research team sought permission from participants' GPs for their patients to take part.

The exercise intervention

To support participation, patients were given a bus pass, sports clothing and a two month gym membership at Lifestyles gyms which are operated by Liverpool City Council. Participants all had a gym induction with a gym instructor and all were given a programme of gym based activities. Participants were asked to attend the gym at least twice a week for eight weeks and their attendance at the gym was recorded in three ways: their membership swipe card, the key which is used to operate gym equipment and verbally to the research team.

Tools and measurements

Participants were asked to attend Liverpool John Moores University Sports Science facilities so that a number of measurements could be made; they were asked to attend the university before and after they had participated in their exercise programme so that changes in health outcomes could be ascertained. These included an assessment of resting blood pressure, resting heart rate and self reported wellbeing using the EQ-5D-3L health questionnaire.¹⁸ Mean arterial pressure was calculated as follows: [(systolic pressure – diastolic pressure * 0.3333) + diastolic pressure]. The EQ-5D-3L measures self-reported health on five domains: physical mobility, self care, performance of usual activities, pain/discomfort, and anxiety/depression. Respondents score each domain by reporting whether they are experiencing none, some, or extreme problems; these domains are combined to produce a single index using a validated algorithm.¹⁹ In addition, the EQ-5D-3L health questionnaire asks respondents to rate their health on a visual analogue scale from 0 (worst imaginable health state) to 100 (best imaginable health state) on the day of questioning.¹⁸ Participants were also asked to take part in a Balke test which involves walking on a treadmill of gradually increasing incline; data on time to fatigue and heart rate are used to calculate metabolic equivalents (METs), an indication of fitness level and a short structured interview.

Qualitative data was also collected from the exercise referral instructors once the pilot was finished. Instructors were invited to take part in a short, semi-structured, topic-guided interview which occurred in May 2012 and was conducted over the telephone. Interviews were recorded and lasted on average 15 minutes. The interview topic guide explored key issues raised by the pilot such as: their views of working with this client group; feasibility issues; their suggestions for what worked well and what could be improved; and their perceptions of being involved in the pilot such as their thoughts on the information and support they received from the research team. Each instructor was also given the opportunity to add additional information or elaborate on issues they felt were important.

Data analysis

Paired t tests were used to compare means before and after participants took part in the exercise programme. Participants who did not complete tests post intervention were not included in this analysis. Analysis of covariance (ANCOVA) was used to explore factors which may affect changes in any of the health measures.

Notes taken through participant interviews were scrutinised and responses were grouped. For the instructor interviews, transcript data were grouped into broad themes and a form of interpretative coding was used. The validity of the different interpretations and suggested relationships between these core themes was explored and tested against the data using the constant comparative method²⁰ and accounting for deviant cases.²¹

Ethics

Liverpool John Moores Research Ethics Committee gave the study ethical approval.

Results

We received 26 applications from potential participants and obtained GP consent forms for 25 of these. We were able to contact 22 of these potential participants. Of the five remaining people one was too unwell to participate, one had obtained a gym membership elsewhere and the research team failed to contact the remaining three on the contact details they had provided. We arranged 17 gym inductions (five females and 12 males) and 14 people started exercising post induction. The mean age of participants was 46.1 years (range 40.5 to 60.7).

Attendance

Attendance data from three different methods did not always tally. In general verbal reports tended to overestimate attendance. Attendance data from the membership card and key were date stamped and did not always match so were combined to give an overall objective assessment of attendance. Table 1 provides attendance details (using combined key and membership data) for the 17 people involved in the study. The mean weeks of attendance for the 17 participants was 4.8 (range 0 to 8) and the mean number of gym attendances was 6.8 (range 0 to 24).

Table 1: Gym attendances by participant

| Participant ID | Number of weeks attended* | Total number of attendances | Reason for terminating contact |
|----------------|---------------------------|-----------------------------|---|
| 9 | 0 | 0 | Never started |
| 12 | 0 | 0 | Never started |
| 20 | 0 | 0 | Never started |
| 17 | 1 | 1 | Went into residential drug detoxification |
| 19 | 2 | 4 | Dropped out |
| 5 | 3 | 3 | Dropped out |
| 1 | 5 | 9 | Exercise exacerbated COPD |
| 13 | 6 | 2 | Experienced problems with leg ulcers and was admitted to hospital |
| 4 | 6 | 4 | Dropped out |
| 18 | 6 | 7 | Exercised in week 6, then ill. Keen to continue |
| 6 | 6 | 10 | Exercised in week 6. Missed weeks 7 and 8 because mother ill and could not attend gym due to caring responsibilities |
| 3 | 7 | 5 | Exercised in week 7. Father developed serious illness and could not attend gym due to caring responsibilities. Keen to continue |
| 14 | 8 | 7 | Not applicable |
| 10 | 8 | 9 | Not applicable |
| 15 | 8 | 14 | Not applicable |
| 8 | 8 | 16 | Not applicable |
| 2 | 8 | 24 | Not applicable |

*Refers to the final week the person exercised. If a person exercised in weeks one and four, this value would be four.

Health outcomes

Eight participants returned for post intervention testing. Four participants did not attend the follow up testing session but completed the EQ-5D-3L and interview over the phone. There was no significant difference comparing baseline and post intervention measures but non-significant beneficial changes were observed in systolic pressure, diastolic pressure, mean arterial pressure, heart rate, METs and general wellbeing measured on the visual analogue scale (Table 2).

Table 2: Differences in baseline and follow up measures

| Variables | No. pairs | Baseline Mean (SD) | Post-exercise Mean (SD) | Difference* (95% CIs) | Paired t (sig) |
|------------------------|-----------|--------------------|-------------------------|-----------------------|----------------|
| Systolic | 8 | 136.6 (15.5) | 133.6 (13.3) | -3.0 (-14.6, 8.6) | -0.61 (0.56) |
| Diastolic | 8 | 83.6 (9.4) | 80.8 (7.4) | -2.9 (-7.2, 1.4) | -1.59 (0.16) |
| Mean arterial pressure | 8 | 101.3 (9.5) | 98.4 (6.8) | -2.9 (-7.4, 1.5) | -1.56 (0.16) |
| Heart rate | 8 | 85.8 (10.5) | 82.1 (14.9) | -3.6 (-13.9, 6.7) | -0.83 (0.43) |
| METs | 8 | 12.4 (2.4) | 12.5 (3.5) | 0.1 (-2.6, 2.7) | 0.05 (0.96) |
| EQ5D index | 12 | 0.8 (0.2) | 0.8 (0.2) | -0.0 (-0.1, 0.0) | -0.65 (0.53) |
| EQ5D VAS | 12 | 65.0 (25.2) | 73.8 (19.3) | 8.8 (-6.5, 24.0) | 1.27 (0.23) |

*Negative indicates reduction in value at follow up.

The changes on each health measure were then tested separately against the remaining six factors listed in Table 3 (i.e. age, height, weight, amount of exercise in past week, number of gym attendances and number of weeks of attendance). Height significantly influenced diastolic pressure ($p=0.03$) and therefore mean arterial pressure ($p=0.05$). Weight and the number of weeks of attendance had considerable effects on METs ($p=0.04$ and $p=0.03$ respectively). Age and the number of attendances are potential factors affecting METs changes ($p=0.07$ and $p=0.07$ respectively).

Table 3: ANCOVA test results of demographic covariates and attendance data on the changes of each of the health measures separately

| Variables | Age | Height | Weight | Exercise in past week | Number of attendances | Number of weeks |
|------------------------|------|--------|--------|-----------------------|-----------------------|-----------------|
| Systolic | 0.06 | 0.52 | 0.74 | 0.82 | 0.45 | 0.78 |
| Diastolic | 1.00 | 0.03* | 0.54 | 0.49 | 1 | 0.15 |
| Mean arterial pressure | 0.15 | 0.05* | 0.92 | 0.81 | 0.52 | 0.54 |
| Heart rate | 0.16 | 0.26 | 0.97 | 0.84 | 0.16 | 0.70 |
| METs | 0.07 | 1.00 | 0.04* | 0.76 | 0.07 | 0.03* |
| EQ5D index | 0.35 | 0.40 | 0.86 | 0.74 | 0.35 | 0.97 |
| EQ5D VAS | 0.40 | 0.25 | 0.49 | 0.53 | 0.40 | 0.96 |

* significant at 5% significance level

Interviews with participants

Participants gave a range of reasons for taking part in the project. Fifteen said they wanted to improve their health and fitness or because they felt that exercise would help with an underlying health condition such as chronic obstructive pulmonary disease. Other reasons included: to lose weight, to initiate a healthier lifestyle, to socialise, to fill time, to do something new, to increase self esteem, to improve quality of life, to provide a break from caring responsibilities and as a gateway back into sports. Four participants expressed fears about exercising; these fears were: lacking motivation, concern about the perception of other gym attendees towards them, the possibility of underlying medical conditions being exacerbated or limiting exercise participation.

Post intervention, participants were asked specifically if they felt participating in exercise had had a positive impact on their health and wellbeing and 11 of the 12 participants who were interviewed said they felt fitter and/or healthier. The remaining participant felt she had overdone it in the gym which had exacerbated breathing difficulties. Other positive benefits described by participants included: mixing with others, overcoming self consciousness, improving confidence and self esteem, relieving stress, reason to get up and out of the house, eating more healthily and reducing smoking. Two people found the gym

intimidating. A number of participants stated they would like to take part in other activities outside the gym such as Zumba classes, yoga, Pilates, outdoor activities, boxing training, football, swimming and running. In general participants felt well supported by the gym instructors, although on further questioning, the level of support varied considerably; some reported that their instructor actively sought them out in order to review their exercise programme, while others said they had little contact post induction.

All those who took part in the follow up interview, including those who had dropped out of the intervention, stated they would like to continue to participate in physical activity. All participants said that they found the Balke test acceptable.

Interviews with exercise referral instructors

Three female and four male instructors were interviewed and most had been instructing for over ten years. In general, instructors said they had no difficulty working with these participants and stressed the importance of treating them like any other GP referral client so they were not ‘singled out’ and stigmatised for being drug users. One instructor was initially apprehensive because he was unsure whether or not the participant was actively using drugs. Some instructors felt that these participants were actually fitter than the average GP referral client and one instructor reported particularly good progress for one participant: *‘his fitness levels shot up and he’s not even eating unhealthy food now and it makes him feel a lot more better in himself.’* However, two other instructors felt their clients were not ready and suggested the need for better screening in order to ascertain the reasons for this. All instructors were keen to take on more clients of this nature.

Instructors said that inductions lasted between 40 and 60 minutes; participants discussed their aspirations for the programme. Drug use and diet were discussed by some instructors. Clients exercised when they wished so post induction contact with an instructor varied from frequently to none at all. One instructor said he was disappointed not to have had more contact while another commented: *‘the more interaction the better.’*

When asked what could be improved, there was disagreement with how the programme should operate. One instructor felt one-to-one support was best because he believed that this group of clients were often self-conscious and group work could result in them being ‘singled out’ by other gym attendees. A second instructor disagreed, advocating group work or a buddy system so they were not exercising alone or a more formal programme of activities with goal setting and weekly assessment and generally more support. Asking what the clients themselves wanted in terms of how the programme was organised was also suggested. Instructors mentioned that participants were not always using their keys to operate the gym equipment, were going to other gyms where the exercise data would not be recorded or they were using another person’s key.

Discussion

This study investigated the feasibility of using exercise referral to improve the health and wellbeing of drug users aged 40 and over and we show it was possible to identify older drug users willing to take part. Only one GP did not respond to the research team and the GPs that did respond all gave consent for their

patients to participate in the project. In general, instructors found no problems working with this client group and were happy to continue to work with older drug users. Of the 22 potential participants, 17 gym inductions could be organised; the research team could not contact three of these people using the contact details they provided. Of the 17 people who had a gym induction, three did not exercise and it is possible that they were incentivised to contact the research team for the sports clothes and bus pass but were not interested in taking part in exercise. Better screening of potential participants is clearly necessary. Indeed the National Quality Assurance Framework (NQAF) recommends a formal assessment of readiness to change behaviour to identify people unlikely to attend the initial assessment and those likely to drop out.²² One participant had to stop participating after just one week because he went into residential rehabilitation; in a larger study we would also ask participants to tell us of any planned absences likely to affect their ability to partake and would exclude anyone whose commitments precluded engagement with the study over the full duration.

Five people attended the gym in week eight and these five had relatively high total attendances (Table 1). The mean weeks of attendance for the 17 participants was 4.8 (range 0 to 8) and the mean number of gym attendances was 6.8 (range 0 to 24). Attendance tended to fluctuate with people missing weeks. The main reasons for non-attendance were illness and caring responsibilities. Interruptions in attendance may reduce motivation²³ but we did observe some participants re-attending after a few weeks absence. Due to the fluctuating nature of attendance, it is not possible to conclude that all participants not exercising in week eight had dropped out permanently (Table 1). In an ad hoc discussion with the research team the participant with the highest attendance suggested that attendance could be encouraged using incentives such as additional sports kit for reaching pre-defined milestones. Incentives have been used successfully in a previous study on the effectiveness of physical activity for drug users¹³ and will be considered in a larger study.

Evaluations of exercise referral schemes have frequently failed to use objective measures to record attendance and levels of activity and there have been calls to use leisure centre data to facilitate this.^{24 25} In this pilot study we collected data on attendance in three different ways and compared these: membership swipe cards, keys used to work the gym equipment and verbal feedback from participants. In general, verbal reports tended to overstate the number of times that participants attended the gym. Data from both the key and membership cards were date stamped and these did not always tally. It is clear from this study that participants did not always swipe their membership cards on entering the gym and could not always use their keys to operate gym equipment.

We used physiological measures to evaluate changes in health status. As this was a pilot study with a small sample size, we were not aiming to identify significant differences, but rather to test the acceptability of our research methods. All participants found the Balke test acceptable showing its utility for a larger study. Reductions in systolic, diastolic and mean arterial pressure and heart rate were observed for the eight participants for whom baseline and follow up data were collected. General wellbeing also improved. Furthermore, ANCOVA analysis showed a significant effect of weeks of attendance on improvements in fitness (METs). Qualitative feedback showed that 11 of the 12 participants who were interviewed said they felt fitter. Furthermore two said they had started eating more healthily and two said they were smoking fewer cigarettes. It will be important to capture such changes in a larger study.

The role of the exercise professional is central to successful outcomes and is crucial in maintaining people's motivation and adherence. Supervision, support and structure are powerful motivators and relationships with staff help to develop self esteem and satisfaction.^{24 26-28} Supervised exercise referral programmes have better results than non-supervised programmes although they incur additional cost,²⁹ while monitoring and reviewing progress helps to increase motivation and prevent drop out.²⁶ Exercise accompanied by psychosocial, theory driven, motivational activities is more effective than exercise alone.²⁵^{30 31} In general participants felt well supported and knew staff were on hand if needed but the level of support varied considerably between instructors. Three participants specifically commented that they liked the flexibility of being able to exercise when they wished but others would have welcomed more support and may have benefited from a more formal programme of activities and assessment. Both increased supervision and the inclusion of motivational activities will be considered further for inclusion in a larger study. All participants that took part in the follow up interview stated that they had enjoyed taking part. However not all participants enjoyed the gym environment and would have liked to participate in other activities.

There is a recognised need to increase the evidence base for the long term effectiveness of exercise referral schemes for particular patient groups and using rigorous research designs. This pilot study has enabled us to evaluate the practicalities of developing an exercise intervention for older drug users. We show it is possible to recruit older drug users and that some attended regularly but factors to reduce attrition and increase attendance, such as screening, motivational activities, enhanced support and offering a wider range of activities will all be considered for a larger study. The observed positive changes in health measures, particularly the association between attendance and increased fitness suggests that further investigation of exercise to improve the health of older drug users is warranted.

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Centre for Public Health
Research Directorate
Faculty of Health and Applied Social Sciences
Liverpool John Moores University
2nd Floor, Henry Cotton Campus
15-21 Webster Street
Liverpool
L3 2ET

Telephone: 0151 231 4451

E-mail: c.m.beynon@ljmu.ac.uk

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