Keeping Active: Maintenance of physical activity after exercise programmes for older adults.

Kendrick D[1] (MD, MFPH), Orton E[1] (PhD, FFPH), Lafond N[1] (MPhil, MSc), Audsley S[1] (MRes, MSc), Maula A[1] (MPH, MRCGP), Morris R[2] (PhD, MSc), Vedhara K[1] (PhD, BA), Iliffe S[3] (FRCP, FRCGP).

[1] School of Medicine, Division of Primary Care, Tower Building, University Park, Nottingham, NG7 2RD, UK.

[2] School of Social and Community Medicine, University of Bristol, Office 3.05, Canynge Hall, 39 Whatley Road, Bristol BS8 2PS

[3] Research Department of Primary Care and Population Health, UCL, Royal Free campus, Rowland Hill St, London NW3 2PF, UK.

Correspondence to: Professor Denise Kendrick

(ORCID ID orcid.org/0000-0003-3603-6542)

E mail: denise.kendrick@nottingham.ac.uk

Tel: 0115 8466914

Acknowledgements:

We would like to thank the patients and practices that took part in our study.

Declaration of interest: DK, EO, NL, AM and KV are employed by, and SA is a PhD student at the University of Nottingham which received research grant funding to undertake this research.

Word count: 3000

Abstract word count: 253

Abstract

Objectives

To explore factors associated with maintenance of moderate-to-vigorous physical activity (MVPA) in community-dwelling adults aged ≥65 years after completing a 24-week exercise programme.

Study design

Cohort study nested within a randomised controlled trial evaluating group and home-based exercise programmes for older people in England.

Methods

MVPA levels and factors potentially associated with physical activity (PA) were self-reported at recruitment, 6, 12, 18 and 24 months post exercise programme. Multilevel logistic regression estimated odds ratios for achieving target MVPA level (150 minutes/week) 6-24 months after exercise programmes ended.

Results

Older people (OR per year increase: 0.89, 95%CI 0.86, 0.93) and women (OR 0.47, 95%CI 0.33, 0.67) were less likely to achieve target MVPA. Those physically active at recruitment (OR 11.28, 95%CI 7.95, 16.01), with wider social networks (OR per unit increase in Lubben Social Network Scale: 1.06, 95%CI 1.03, 1.10) and performing more sit-to-stands in 30 seconds (OR for quartile 3 compared to quartile 1: 1.87, 95%CI 1.12, 3.10) were more likely to achieve target MVPA. Negative exercise expectations increased the odds of achieving target MVPA, but only amongst the less active at recruitment (OR per unit increase in Outcome and Expectation for Exercise Negative Subscale: 1.90, 95%CI 1.39, 2.60). Associations did not differ significantly across the follow-up period.

Conclusion

A range of factors are associated with maintenance of PA 6-24 months after exercise programmes. Factors are not more strongly associated with shorter versus longer term PA maintenance. Commissioners and providers should consider targeting maintenance interventions to those least likely to maintain PA.

Keywords: Older people; exercise promotion; physical activity

Introduction

Physical activity (PA) reduces the risk of cardiovascular disease, type 2 diabetes, osteoporosis, falls, hip fractures, certain cancers, and all-cause mortality (1-3) and improves musculoskeletal pain (4). Promoting PA in older people could prevent functional decline, frailty, falls and fractures (5). Current PA recommendations are 150 minutes of moderately vigorous physical activity (MVPA) per week, including activities that improve muscle strength and balance, and reduced sedentary behaviour.(6) However, physical inactivity among the older population is widespread(7) and although exercise programmes can be effective in increasing PA in older people (8), many do not maintain PA levels at the end of such programmes (9). Understanding which factors are associated with continuation of PA is important when designing, implementing and commissioning interventions that seek to foster long-term increases in PA.

There is some evidence about what works to maintain PA. A systematic review in 2008 reported "booster" interventions (e.g. including mailed reminders, phone calls, email, internet or group sessions) were effective, but which interventions were most effective was unclear (10). A systematic review in 2009 recommended interventions to maintain PA amongst older people should emphasise satisfaction with PA achievements, increase self-efficacy to maintain PA, encourage positive mood and intentions, remove barriers to PA maintenance, enhance the physical environment for PA and help older people develop coping plans(11).

In terms of factors associated with PA maintenance, the 2009 review (11) found mixed evidence for the effect of age and gender, whilst a 2011 systematic review (12) found moderate evidence that younger age and male gender were positively associated with PA. However, many studies explored only a limited number of factors and the evidence was of low quality.. A third review from 2013 (13), suggests beliefs about capabilities and motivation and goals are among factors with the strongest associations with PA maintenance. An RCT of a six months PA intervention with older adults in the USA suggested social support, affect, and exercise frequency influenced self-efficacy at the end of the intervention, and self-efficacy was related to PA at 6- and 18-months follow-up (14). Further follow-up of this cohort showed older adults with higher levels of PA, more positive affect, and higher self-efficacy at year 2 were more likely to continue to be active at year 5 (15). All three reviews called for further studies exploring factors associated with PA maintenance in older people due to inconsistent findings or low quality evidence. (11-13) Two of the reviews defined PA maintenance as regular exercising or PA for ≥6 months after exercise programmes had ceased or in

those who had increased their PA level on their own (11, 13). It was unclear in third review the extent to which studies reported maintenance of PA beyond the end of exercise programmes.(12) Given this, it is important to explore factors associated with longer term maintenance of PA after the end of exercise programmes.

Our ProAct 65+ trial of PA promotion in people aged 65 and over, showed the 24-week Falls Management Exercise programme (FaME) increased self-reported PA for at least 12 months after the end of the programme and reduced falls (16). Unlike many trials, outcome data was collected for 24 months after the end of the exercise programme and a large number of factors that may be associated with PA maintenance were measured. This paper explores factors associated with maintenance of PA up to 24 months after the end of the exercise programmes and whether factors are associated with shorter or longer term PA maintenance. Such data can be used to inform the commissioning and provision of, community exercise programmes aiming to secure sustained active lifestyles in older people.

Methods

Setting and participants

This paper presents findings from a cohort study nested within a 3-arm cluster randomised controlled trial in which general practices in London, Nottingham and Derby were randomised to treatment arms. Full details of trial methods are given in the published protocol(17). Briefly, the 3 arms were group exercise classes (24-week Falls Management Exercise Programme (FaME, home exercise (24-week OTAGO exercise programme (OEP)) and usual care. The FaME programme comprised a one hour-long postural stability instructor delivered group exercise class in a local community centre for ≤15 participants, and two 30 minute home exercise sessions (instruction booklet based on the OEP) per week for 24 weeks. Participants were advised to walk at least twice per week for up to 30 minutes at a moderate pace. The programme included leg muscle strengthening and balance retraining that progressed in difficulty, progressive trunk and arm muscle strengthening, bone loading, endurance (including walking) and flexibility training, functional floor skills and adapted Tai Chi. Group exercises included retraining of getting up from, and down to, the floor (using a backward chaining approach) and floor exercises to improve balance, trunk and lower body strength and flexibility and coping strategies, to reduce the risk of complications resulting from a long lie. The exercise programmes provided information about local exercise opportunities to all participants at the end of the intervention period, but did not include other interventions aimed at

maintaining PA beyond the end of the programme. Participants were aged ≥65 years, independently mobile and physically able to take part in a group exercise class. Exclusion criteria included ≥ 3 falls in the previous year, unstable clinical conditions, unable to follow instructions about exercise safely, receiving palliative care or already exercising at or above the target level (≥ 150 minutes of MVPA per week).

Data collection

Participants completed questionnaires at recruitment, immediately post intervention and at 6, 12, 18 and 24 months after the end of the intervention. Questionnaires asked about the following exposures: socio-demographic details; co-morbidities and medications; and used validated tools to measure confidence in balance (ConfBal scale(18)); confidence in carrying out a range of basic activities of daily living without falling (Falls Efficacy Scale-International (Short-FES-I)(19)); positive and negative outcomes and expectations for exercise (OEE +/-)(20); quality of life (Older People's QoL Questionnaire (OPQOL)(21-23) and SF-12(24)).; social network (brief Lubben Social Network scale(25)); perceived social support (Multidimensional Scale of Perceived Social Support (MSPSS)(26)) and falls risk (Falls Risk Assessment Tool (FRAT)(27)). The outcome for this study was MVPA, measured using the Community Healthy Activities Model Program for Seniors (CHAMPS) questionnaire (28) at recruitment and all follow-up time points. Supplementary table 1 describes these tools.

Statistical analysis

The analysis presented in this paper explored associations between factors measured at recruitment and reaching the target MVPA at 6, 12, 18 or 24 months after the end of the intervention (hereafter referred to as "at follow-up"). The sample for this analysis comprised 731 participants who had MVPA data for at least one follow-up time point. The variables listed above, plus trial arm and reaching MVPA target at recruitment, were considered as potential factors associated with reaching MVPA target at follow-up. Variables are described using frequencies and percentages for categorical data and means and standard deviations (SDs) or medians and interquartile ranges as appropriate for normally distributed continuous data.

Univariate associations between exposure variables and the binary variable for reaching MVPA target at follow-up were assessed using multilevel logistic regression with observations at level 1 and participants at level 2 to account for multiple observations per participant. Clustering by general practice was accounted for using robust standard errors. Correlations between variables were

assessed and were found to be > |0.5| for (a) ConfBal and FES-I and (b) number of medications which was correlated with both the number of comorbidities and the FRAT. ConfBal was excluded from the modelling as it had higher correlations with other variables than FES-I. The number of medications was excluded from modelling as this is included within the FRAT.

We used the model building approach described by Collett.(29) Variables with a p-value of <0.2 on univariate analysis were entered in one block into a multivariable model. In order that we could explore if variables were associated with short or longer term achievement of the MVPA target, a time variable (6, 12, 18 and 24 months) was included in all models. Variables with a p-value of ≥0.05 were removed in order of least significance first based on the Wald test, until no more variables could be removed because all those remaining in the model had a p-value of<0.05. Those that had been removed were then reassessed for inclusion and were retained in the model only if the Wald p-value was <0.05. Interactions between the other variables in the model and (a) time, (b) age, (c) gender and (d) meeting MVPA target at recruitment were assessed by separately adding interaction terms to the multivariable model with significance tested by Wald tests with a p value of <0.01 taken as significant. We explored interactions with time to assess whether factors were associated with shorter or longer term PA maintenance. The choice of other interactions to explore was informed by the literature (30, 31) and an ongoing qualitative study by the authors exploring PA maintenance amongst older people. Models were checked by plotting residual values and by assessing robustness to excluding observations with large values (> |2.5|).

Trial registration

ClinicalTrials.gov (NCT00726531) and ISRCTN (ISRCTN43453770).

Results

A total of 731 participants had MVPA data for at least one time point between 6 and 24 months after the end of the intervention and formed the sample for analysis. The flow of participants through the study up to the primary endpoint (12 months) has been published (available at: http://www.ncbi.nlm.nih.gov/pubmed/25098959, page 31)(32). Participant characteristics are shown in table 1. The median age was 72 years, 64% were female, 48% had attended college or university, 45% had been in managerial or professional occupations and 92% were not working. The median number of comorbidities was 2, the median number of medications was 3, the median FRAT score was 1 and 43% met the MVPA target at recruitment.

[insert table 1 here]

The numbers and percentages reaching the MVPA target over time for each exercise programme and for the usual care group is shown in table 2. Figure 1 shows only the FaME exercise programme showed an increase in MVPA target achievement (42% at recruitment; 54% at the end of the FaME programme; 48% 24 months after the end of the programme).

[insert table2 and figure 1 here]

Univariate associations between factors and reaching MVPA target at follow-up are shown in tables 3 and 4. Trial arm, ethnic group, socio-economic status, smoking and the mental component of the SF12 score had p values above 0.2 and were not considered for inclusion in the multivariable model.

[insert tables 3 and 4 here]

Multivariable associations between factors and reaching the MVPA target at follow-up are shown in table 5. Older people (OR for 1 year increase in age: 0.89, 95%CI 0.86, 0.93) and women (OR 0.47, 95%CI 0.33, 0.67) had a significantly reduced odds of achieving MVPA target at follow-up. Those achieving MVPA target at recruitment (OR 11.28, 95%CI 7.95, 16.01), those with wider social networks (OR for 1 unit increase in Lubben Social Network Scale: 1.06, 95%CI 1.03, 1.10), those able to perform more sit to stands in 30 seconds (OR for quartile 3 compared to quartile 1: 1.87, 95%CI 1.12, 3.10) and those with more negative exercise expectations (OR for 1 unit increase in OEE Negative Subscale: 1.51, 95%CI 1.11, 2.05) had a significantly greater odds of achieving MVPA target at follow-up. The only significant interaction was between MVPA measured at recruitment and negative exercise expectations (p=0.007). In those who were less active at recruitment (not meeting MVPA target) negative exercise expectations were associated with a significantly increased odds of achieving MVPA target at follow up (OR 1.90, 95%CI 1.39, 2.60); but no significant association was found between negative exercise expectations and achieving MVPA target (OR 1.10, 95%CI 0.73, 1.65) in those more active at recruitment (achieving MVPA target). There were no significant interactions between any factors in the model and time, suggesting none of the factors were more strongly associated with longer rather than shorter term achievement of MVPA target. Models were robust to excluding observations with large residual values.

[insert table 5 here]

Discussion

Main findings

Our study has shown a range of factors are associated with meeting MVPA target between 6 and 24 months after the end of exercise programmes and that none of these factors were more strongly associated with longer rather than shorter term achievement of MVPA target. Older people and women had a reduced odds of reaching MVPA target at follow up, whilst those reaching MVPA target at recruitment, those with wider social networks, and those able to do more sits to stands in 30 seconds had a greater odds of reaching MVPA target at 6-24 months follow-up. More negative expectations of exercise outcomes were associated with increased odds of reaching MVPA target at 6-24 months follow-up, but only amongst those less active at recruitment. Our findings showed PA at recruitment had, by far, the strongest association with PA maintenance.

Strengths and limitations

Strengths of this study include the use of a large sample of community dwelling older people, collection of data on a wide range of characteristics including demographic, medical, psychological, functional and social factors, the longitudinal design and measurement of PA 6 monthly up to 24 months after the end of the exercise interventions.

Our study population had an average age of 73 years, and was predominantly female, white, with a high level of education and higher socioeconomic status. As PA declines rapidly above the age of 75 years and varies by gender and socio-economic deprivation (7) our findings may not be generalisable to the general older population. Our study population appears similar to the general population in terms of PA at recruitment, and given the mean age of our study population, this is probably similar to the 2016 Health Survey for England which found 55% aged 65-74 years and 30% aged 75+ met MVPA recommendations.(7)

Our study used self-reported PA which may overestimate actual PA(33, 34), but self-reported activity predicts functional ability 3–5 years later(35) and long term all-cause mortality(36), making it a useful outcome measure. Several social-cognitive factors not measured in our study such as self-efficacy, behavioural control, behavioural intentions and goals have been found to be associated with PA in older adults(11, 31). Our study did measure falls self-efficacy and found, on univariate analysis, that those more concerned about falling were significantly less likely to maintain PA, although this did not remain significant in the multivariable analysis. However, previous studies suggest socio-demographic, medical factors and functional ability are more strongly associated with

PA in older adults than social-cognitive factors (37, 38). A range of environmental factors have also been found to be associated with PA, including pedestrian infrastructure, safety, access to amenities, aesthetics and environmental conditions(11, 39) and these were not measured in our study.

Comparisons with the current literature

Although previous reviews mainly included studies with shorter follow-up periods than ours, they did find some evidence supporting our findings for age and gender(11, 12) and "a convincing positive association" between baseline PA and PA maintenance, consistent with our findings.(11) Our finding that PA at recruitment had the strongest association with PA maintenance in older people is also consistent with previous work (40) which highlights the importance of PA prior to old age and the need to promote and maintain PA across the life-course.

Studies within the 2009 review also found physical fitness was associated with PA maintenance, consistent with our association between lower limb strength (measured with 30 second sit to stands) and PA maintenance. Only one study in the review reported on social networks, finding results similar to ours. The review failed to find convincing evidence that outcome expectations were associated with PA maintenance but better evidence that realisation of exercise outcomes were associated with PA maintenance. This is consistent with our finding that negative expectations were associated with PA, but only amongst the less active, possibly because these have more to gain from PA programmes than the more active.(6)

Most of the studies in the 2009 (11) and 2011 (12) reviews explored fewer factors potentially associated with PA maintenance than our study and did not measure baseline PA or report on its moderating effect on other factors associated with PA.

Implications for research and practice

More research is needed exploring a wider range of factors associated with longer term maintenance of PA in older people and the mechanisms by which the factors we found operate to maintain PA. Further research is also required to explore the utility of these factors in predicting PA maintenance at an individual level to further inform the design and targeting of exercise programmes for older people.

Commissioners in the NHS and in local government currently funding community-based PA programmes may wish to characterise those who are less likely to maintain PA levels achieved,

beyond the end of their programmes. Our study suggests that to optimise benefits PA maintenance programmes should target older women, those with narrower social networks, those with poorer lower limb strength, and less active older adults with negative expectations of exercise.

Opportunities and support for staying active, as well as interest, motivation and ability to undertake PA will change as people age. It may be unrealistic to expect a 24 week exercise programme to continue to meet an older person's PA needs and result in PA maintenance over many years, long after the programme has ended. In addition, strength and balance programmes, such as FaME, do require specialist workforce for delivery and relatively small class sizes (10-14 adults). Therefore, alternative approaches for enhancing and sustaining PA may need to be offered that transition participants onto less specialist community-based programmes such as Tai Chi.

Our study focussed on community-based exercise referral programmes. These are likely to have limited impact on increasing PA in older people on a population level. Other strategies will also be required including community wide campaigns, other individually tailored health behaviour change programmes, social support interventions, increasing access to places for PA coupled with information provision, urban design, and policy on land use, travel and transport.(41)

Funding

This article presents independent research funded by the National Institute for Health Research (NIHR) School for Primary Care Research. Grant Reference Number: 264. The funding source and sponsor had no role in study design, collection, analysis or interpretation of data, writing the report or in the decision to submit for publication.

Ethical approval

Ethical approval was obtained from Nottingham Research Ethics Committee 2 (08/H0408/72).

References

1. Department of Health. Choosing activity: a physical activity action plan. London: Department of Health, 2005.
2. Gregg EW, Pereira MA, Caspersen CJ. Physical activity, falls, and fractures among older adults: a review of the epidemiologic evidence. J Am Geriatr Soc. 2000;48(8):883-93. Epub 2000/09/01.
3. Blair SN, Kampert JB, Kohl HW, 3rd, Barlow CE, Macera CA, Paffenbarger RS, Jr., et al. Influences of cardiorespiratory fitness and other precursors on cardiovascular disease and all-cause mortality in men and women. JAMA. 1996;276(3):205-10. Epub 1996/07/17.

4. O'Connor SR, Tully MA, Ryan B, Bleakley CM, Baxter GD, Bradley JM, et al. Walking Exercise for Chronic Musculoskeletal Pain: Systematic Review and Meta-Analysis. Arch Phys Med Rehabil. 2015;96(4):724-34.e3.
5. McClure R, Turner C, Peel N, Spinks A, Eakin E, Hughes K. Population-based interventions for the prevention of fall-related injuries in older people. Cochrane Database Syst Rev. 2005(1):CD004441. Epub 2005/01/28.
6. Department of Health. Start Active, Stay Active: CMO guidelines for physical activity. London: 2011.
7. NHS Digital. Health Survey for England, 2016. Available from https://digital.nhs.uk/catalogue/PUB30169.
8. Olanrewaju O, Kelly S, Cowan A, Brayne C, Lafortune L. Physical Activity in Community Dwelling Older People: A Systematic Review of Reviews of Interventions and Context. PLoS ONE. 2016;11(12):e0168614. Epub 2016/12/21.
9. Chao D, Foy CG, Farmer D. Exercise adherence among older adults: challenges and strategies. Control Clin Trials. 2000;21(5 Suppl):212S-7S. Epub 2000/10/06.
10. Müller-Riemenschneider F, Reinhold T, Nocon M, Willich SN. Long-term effectiveness of interventions promoting physical activity: A systematic review. Prev Med. 2008;47(4):354-68.
11. van Stralen MM, De Vries H, Mudde AN, Bolman C, Lechner L. Determinants of initiation and maintenance of physical activity among older adults: a literature review. Health Psychology Review. 2009;3(2):147-207.
12. Koeneman MA, Verheijden MW, Chinapaw MJ, Hopman-Rock M. Determinants of physical activity and exercise in healthy older adults: a systematic review. The international journal of behavioral nutrition and physical activity. 2011;8:142. Epub 2011/12/30.
13. Amireault S, Godin G, Vézina-Im L-A. Determinants of physical activity maintenance: a systematic review and meta-analyses. Health Psychology Review. 2013;7(1):55-91.
14. McAuley E, Jerome GJ, Elavsky S, Marquez DX, Ramsey SN. Predicting long-term maintenance of physical activity in older adults. Prev Med. 2003;37(2):110-8. Epub 2003/07/12.
15. McAuley E, Morris KS, Motl RW, Hu L, Konopack JF, Elavsky S. Long-term follow-up of physical activity behavior in older adults. Health Psychol. 2007;26(3):375-80. Epub 2007/05/16.
16. Iliffe S, Kendrick D, Morris R, Griffin M, Haworth D, Carpenter H, et al. Promoting physical activity in older people in general practice: ProAct65+ cluster randomised controlled trial. Br J Gen Pract. 2015;65(640):e731-8. Epub 2015/10/27.
17. Iliffe S, Kendrick D, Morris RC, Skelton D, Gage H, Dinan S, et al. Multi-centre cluster randomised trial comparing a community group exercise programme with home based exercise with usual care for people aged 65 and over in primary care: protocol of the ProAct 65+ trial. Trials. 2010;11(1):6.
18. Simpson JM, Worsfold C, Hawke J. Balance Confidence in Elderly People the CONFbal Scale. Age Ageing. 1998;27(suppl_2):57-b-.
19. Kempen GIJM, Yardley L, Van Haastregt JCM, Zijlstra GAR, Beyer N, Hauer K, et al. The Short FES-I: a shortened version of the falls efficacy scale-international to assess fear of falling. Age Ageing. 2008;37(1):45-50.
20. Resnick B. Reliability and validity of the Outcome Expectations for Exercise Scale-2. J Aging Phys Act. 2005;13(4):382-94. Epub 2005/11/23.
21. Bowling A, Banister D, Sutton S, Evans O, Windsor J. A multidimensional model of the quality of life in older age. Aging & mental health. 2002;6(4):355-71. Epub 2002/11/12.
22. Bowling A, Gabriel Z, Dykes J, Dowding LM, Evans O, Fleissig A, et al. Let's Ask Them: A National Survey of Definitions of Quality of Life and Its Enhancement among People Aged 65 and Over. The International Journal of Aging and Human Development. 2003;56(4):269-306.
23. Bowling A, Gabriel Z. An Integrational Model of Quality of Life in Older Age. Results from the ESRC/MRC HSRC Quality of Life Survey in Britain. Social Indicators Research. 2004;69(1):1-36.

24. Ware J, Jr., Kosinski M, Keller SD. A 12-Item Short-Form Health Survey: construction of scales and preliminary tests of reliability and validity. Med Care. 1996;34(3):220-33. Epub 1996/03/01.
25. Lubben J, Blozik E, Gillmann G, Iliffe S, von Renteln Kruse W, Beck JC, et al. Performance of an Abbreviated Version of the Lubben Social Network Scale Among Three European Community-Dwelling Older Adult Populations. The Gerontologist. 2006;46(4):503-13.
26. Zimet GD, Dahlem NW, Zimet SG, Farley GK. The Multidimensional Scale of Perceived Social Support. Journal of Personality Assessment. 1988;52(1):30-41.
27. Nandy S, Parsons S, Cryer C, Underwood M, Rashbrook E, Carter YH, et al. Development and preliminary examination of the predictive validity of the Falls Risk Assessment Tool (FRAT) for use in Primary care. Journal of Public Health. 2004;26(2):138-43.
28. Stewart AL, Mills KM, Sepsis PG, King AC, McLellan BY, Roitz K, et al. Evaluation of CHAMPS, a physical activity promotion program for older adults. Annals of behavioral medicine : a publication of the Society of Behavioral Medicine. 1997;19(4):353-61. Epub 1998/08/26.
29. Collett D. Modelling survival data in medical research. 2nd ed. Boca Raton, Florida: Chapman and Hall/CRC; 2003.
30. DiPietro L. Physical Activity in AgingChanges in Patterns and Their Relationship to Health and Function. The Journals of Gerontology: Series A. 2001;56(suppl_2):13-22.
31. Young MD, Plotnikoff RC, Collins CE, Callister R, Morgan PJ. Social cognitive theory and physical activity: a systematic review and meta-analysis. Obes Rev. 2014;15(12):983-95. Epub 2014/11/28.
32. Iliffe S, Kendrick D, Morris R, Masud T, Gage H, Skelton D, et al. Multicentre cluster randomised trial comparing a community group exercise programme and home-based exercise with usual care for people aged 65 years and over in primary care. Health Technol Assess. 2014;18(49).
33. Dyrstad SM, Hansen BH, Holme IM, Anderssen SA. Comparison of self-reported versus accelerometer-measured physical activity. Med Sci Sports Exerc. 2014;46(1):99-106. Epub 2013/06/25.
34. Adams SA, Matthews CE, Ebbeling CB, Moore CG, Cunningham JE, Fulton J, et al. The effect of social desirability and social approval on self-reports of physical activity. Am J Epidemiol. 2005;161(4):389-98. Epub 2005/02/05.
35. Young DR, Masaki KH, Curb JD. Associations of physical activity with performance-based and self-reported physical functioning in older men: the Honolulu Heart Program. j Am Geriatr Soc. 1995;43(8):845-54. Epub 1995/08/01.
36. Eaton CB, Medalie JH, Flocke SA, Zyzanski SJ, Yaari S, Goldbourt U. Self-reported physical activity predicts long-term coronary heart disease and all-cause mortalities. Twenty-one-year follow-up of the Israeli Ischemic Heart Disease Study. Archives of family medicine. 1995;4(4):323-9. Epub 1995/04/01.
37. Mesters I, Wahl S, Van Keulen HM. Socio-demographic, medical and social-cognitive correlates of physical activity behavior among older adults (45-70 years): a cross-sectional study. BMC public health. 2014;14:647. Epub 2014/06/27.
38. Gretebeck KA, Black DR, Blue CL, Glickman LT, Huston SA, Gretebeck RJ. Physical activity and function in older adults: theory of planned behavior. Am J Health Behav. 2007;31(2):203-14. Epub 2007/02/03.
39. Moran M, Van Cauwenberg J, Hercky-Linnewiel R, Cerin E, Deforche B, Plaut P. Understanding the relationships between the physical environment and physical activity in older adults: a systematic review of qualitative studies. The international journal of behavioral nutrition and physical activity. 2014;11:79. Epub 2014/07/19.
40. Hirvensalo M, Lintunen T. Life-course perspective for physical activity and sports participation. European Review of Aging and Physical Activity. 2011;8(1):13-22.
41. Centers for Disease Control and Prevention. Strategies to Prevent Obesity and Other Chronic Diseases: The CDC Guide to Strategies to Increase Physical Activity in the Community. Atlanta: U.S. Department of Health and Human Services, 2011.

Table(s)

Table 1. Characteristics of study participants at recruitment

Characteristic	Frequency (%) n=731
Trial arm: Usual care FaME OEP	[0] 271 (37.1) 227 (31.1) 233 (31.9)
Gender: Male Female	[0] 267 (36.5) 464 (63.5)
Ethnicity White Non-white	[14] 633 (88.3) 84 (11.7)
Lives alone No Yes	[4] 474 (65.2) 253 (34.8)
Education: Primary/secondary school College/University	[11] 372 (51.7) 348 (48.3)
Socio-economic status: Managerial and professional occupations Intermediate occupations Routine, manual occupations, never worked and long-term unemployed	[31] 314 (44.9) 206 (29.4) 180 (25.7)
Income (£): ≤12000 12001 to 20000 20001 to 30000 30001 to 45000 >45000	[88] 183 (28.5) 187 (29.1) 152 (23.6) 71 (11.0) 50 (7.8)
Employment: Full/part-time employment Not working	[7] 56 (7.7) 668 (92.3)
Smoking status: Current smoker Ex-smoker Never smoker	[2] 34 (4.7) 299 (41.0) 396 (54.3)
≥ 150 minutes moderate-vigorous physical activity at recruitment No Yes	[40] 392 (56.7) 299 (43.3)
	Mean (SD) or median (IQR)
Age Median (IQR) Mean (SD)	[0] 72 (68, 76) 72.5 (5.8)
BMI Mean (SD)	[22] 26.5 (4.7)
Number of comorbidities Median (IQR) Mean (SD)	[1] 2 (1, 3) 1.7 (1.6)
Number of medications	[5]

Median (IQR) Mean (SD)	3 (1, 6) 3.7 (3.1)
Confidence in balance (ConfBal; range 10-30) Median (IQR) Mean (SD)	[56] 10 (10, 13) 11.9 (3.2)
Falls efficacy (short FES-I; range 7-28) Median (IQR) Mean (SD)	[49] 7 (7,9) 8.7 (3.5)
Older people's quality of life (OPQoL; range 33-165) Mean (SD)	[130] 131.5 (12.9)
Lubben Social Network Scale (LSNS; range 0-30) Mean (SD)	[57] 16.4 (5.6)
Multidimensional Scale of Perceived Social Support (MSPSS; range 12-84) Median (IQR) Mean (SD)	[100] 70 (59, 79) 66.6 (15.9)
Falls risk assessment tool (FRAT; range 1-5) Median (IQR) Mean (SD)	[5] 1 (0, 1) 0.9 (0.9)
12-item Short Form Health Survey (physical; range 0-100) Mean (SD)	[3] 39.0 (5.2)
12-item Short Form Health Survey (mental; range 0-100) Mean (SD)	[2] 49.9 (5.5)
30 second sit to stands Mean (SD)	[8] 10.7 (3.2)
Functional reach (cm) Mean (SD)	[18] 26.1 (7.2)
Timed Up and Go Test (seconds) Median (IQR) Mean (SD)	[50] 9.4 (8.1, 11.0) 10.4 (5.6)
Romberg static balance test (range 0-28) Median (IQR) Mean (SD)	[1] 22 (18, 26) 21.5 (5.5)
Outcome and Expectation for Exercise (positive; range 1-5) Median (IQR) Mean (SD)]	[75] 3.9 (3.6, 4.2) 3.9 (0.6)
Outcome and Expectation for Exercise (negative; range 1-5) Median (IQR) Mean (SD)	[85] 4 .0 (3.5, 4.5) 4.0 (4.0)

Where data are not normally distributed and are described with medians and interquartile ranges, means and standard deviations are also presented for ease of interpretation.

[ ] missing values

FaME: Falls Management Exercise Programme

OEP: Otago Exercise Programme

Table 2. Number and percentage of participants achieving the moderate-to vigorous physical activity target, over time, by exercise group (row percentages).

Exercise group	At trial recruitment N=691	At end of intervention N=644	6 months post intervention N=631	12 months post intervention N=600	18 months post intervention N=581	24 months post intervention N=561
Usual care	108 (42.4)	102 (41.8)	107 (44.2)	84 (37.8)	81 (36.7)	87 (41.2)
FaME	89 (41.8)	110 (54.5)	79 (40.5)	95 (49.2)	89 (49.2)	85 (47.8)
OEP	102 (45.7)	91 (46.0)	85 (43.8)	79 (42.7)	78 (43.6)	74 (43.0)
Total	299 (43.3)	303 (47.1)	271 (42.9)	258 (43.0)	248 (42.7)	246 (43.9)

Table 3. Associations between categorical factors and achievement of physical activity target between 6 and 24 months after the end of the intervention and univariate odds ratios (row percentages)

Characteristics	6 months post intervention		12 months post intervention		18 months post intervention		24 months post intervention		Univariate odds ratio (95%CI) across all time points
	No (%)	Yes (%)	No (%)	Yes (%)	No (%)	Yes (%)	No (%)	Yes (%)	
Trial arm:									P=0.23
Usual care	135 (55.8)	107 (44.2)	138 (62.2)	84 (37.8)	140 (63.4)	81 (36.7)	124 (58.8)	87 (41.2)	1.00
FaME	116 (59.5)	79 (40.5)	98 (50.8)	95 (49.2)	92 (50.8)	89 (49.2)	93 (52.3)	85 (47.8)	1.67 (0.92, 3.05)
OEP	109 (56.2)	85 (43.8)	106 (57.3)	79 (42.7)	101 (56.4)	78 (43.6)	98 (57.0)	74 (43.0)	1.27 (0.68, 2.37)
Gender:									P<0.001
Male	108 (47.2)	121 (52.8)	99 (44.8)	122 (55.2)	101 (47.2)	113 (52.8)	87 (43.5)	113 (56.5)	1.00
Female	252 (62.7)	150 (37.3)	243 (64.1)	136 (35.9)	232 (63.2)	135 (36.8)	228 (63.2)	133 (36.8)	0.27 (0.18, 0.40)
Ethnicity									P=0.36
Non-white	43 (59.7)	29 (40.3)	36 (58.1)	26 (41.9)	42 (65.6)	22 (34.4)	30 (52.6)	27 (47.4)	1.00
White	312 (56.7)	238 (43.3)	303 (56.9)	230 (43.2)	286 (56.3)	222 (43.7)	279 (56.3)	217 (43.8)	1.35 (0.71, 2.58)
Lives alone									P<0.001
No	219 (53.3)	192 (46.7)	208 (53.3)	182 (46.7)	201 (52.9)	179 (47.1)	190 (50.9)	183 (49.1)	1.00
Yes	140 (64.2)	78 (35.8)	132 (64.1)	74 (35.9)	130 (65.7)	68 (34.3)	124 (66.7)	62 (33.3)	0.37 (0.23, 0.61)
Education:									P=0.17
Primary/secondary school	189 (59.8)	127 (40.2)	177 (59.0)	123 (41.0)	181 (61.6)	113 (38.4)	172 (59.5)	117 (40.5)	1.00
College/University	163 (53.4)	142 (46.6)	160 (55.2)	130 (44.8)	145 (52.4)	132 (47.7)	138 (52.5)	125 (47.5)	1.45 (0.85, 2.45)
Socio-economic status:									P=0.56
Managerial and professional occupations	151 (55.9)	119 (44.1)	138 (54.1)	117 (45.9)	138 (57.5)	102 (42.5)	124 (52.8)	111 (47.2)	1.00
Intermediate occupations	105 (59.0)	73 (41.0)	105 (60.7)	68 (39.3)	101 (57.1)	76 (42.9)	99 (59.6)	67 (40.4)	0.77 (0.48, 1.25)
Routine, manual occupations, never worked and long-	92 (57.9)	67 (42.1)	86 (58.9)	60 (41.1)	81 (57.5)	60 (42.6)	81 (58.7)	57 (41.3)	0.87 (0.48, 1.58)

term unemployed									
Smoking status									P=0.30
Current smoker	19 (59.5)	13 (40.6)	16 (55.2)	13 (44.8)	17 (58.6)	12 (41.4)	15 (60.0)	10 (40.0)	1.00
Ex-smoker	143 (54.2)	121 (45.8)	138 (55.2)	112 (44.8)	124 (54.6)	103 (45.4)	119 (52.9)	106 (47.1)	1.39 (0.46, 4.24)
Never smoked	197 (59.2)	136 (40.8)	187 (58.6)	132 (41.4)	191 (59.1)	132 (40.9)	181 (58.6)	128 (41.4)	0.97 (0.32, 2.92)
Annual household income (£)									P=0.06
<12000	99 (63.5)	57 (36.5)	96 (63.2)	56 (36.8)	98 (68.1)	46 (31.9)	86 (63.7)	49 (36.3)	1.00
12001-20000	94 (57.0)	71 (43.0)	91 (58.7)	64 (41.3)	89 (61.4)	56 (38.6)	82 (57.8)	60 (42.3)	1.71 (0.85, 3.45)
20001-30000	70 (53.0)	62 (47.0)	62 (49.2)	64 (50.8)	53 (43.1)	70 (56.9)	54 (45.0)	66 (55.0)	3.40 (1.44, 8.03)
30001-45000	29 (50.9)	28 (49.1)	32 (54.2)	27 (45.8)	31 (50.8)	30 (49.2)	31 (57.4)	23 (42.6)	2.69 (0.95, 7.60)
>45000	24 (55.8)	19 (44.2)	19 (52.8)	17 (47.2)	19 (48.7)	20(51.3)	24 (57.1)	18 (42.9)	2.17 (0.74, 6.38)
Employment									P=0.02
Full/part time	21 (44.7)	26 (55.3)	18 (48.7)	19 (51.4)	19 (46.3)	22 (53.7)	21 (50.0)	21 (50.0)	1.00
Not employed	337 (58.2)	242 (41.8)	320 (57.6)	236 (42.5)	310 (58.2)	223 (41.8)	291 (56.5)	224 (43.5)	0.39 (0.17, 0.88)
At least 150 minutes MVPA at recruitment									P<0.001
No	263 (76.5)	81 (23.6)	242 (77.8)	69 (22.2)	241 (76.8)	73 (23.3)	223 (76.9)	67 (23.1)	1.00
Yes	78 (30.1)	181 (69.9)	83 (31.8)	178 (68.2)	75 (30.5)	171 (69.5)	77 (31.3)	169 (68.7)	21.79 (14.30, 33.20)
Confidence in balance									P<0.001
<=10	151 (46.2)	176 (53.8)	139 (45.1)	169 (54.9)	128 (41.4)	181 (58.6)	132 (43.9)	169 (56.2)	1.00
11-13	90 (61.2)	57 (38.8)	99 (68.8)	45 (31.3)	98 (70.0)	42 (30.0)	93 (67.4)	45 (32.6)	0.20 (0.13, 0.29)
>=14	91 (79.8)	23 (20.2)	80 (73.4)	29 (26.6)	83 (81.4)	19 (18.6)	68 (78.2)	19 (21.8)	0.07 (0.03, 0.14)
Falls efficacy									P<0.001
<=10	272 (53.2)	239 (46.8)	268 (54.8)	221 (45.2)	258 (53.8)	222 (46.3)	245 (52.9)	218 (47.1)	1.00
>=11	66 (77.7)	19 (22.4)	54 (70.1)	23 (29.9)	53 (72.6)	20 (27.4)	52 (77.6)	15 (22.4)	0.16 (0.07, 0.41)
12-item Short Form Health Survey – Physical									P=0.006

(quartiles) 1 (15.98-35.59) 2 (35.6-38.9) 3 (38.93-42.36) 4 (42.37-55.2)	 94 (68.6) 82 (50.6) 101 (54.9) 83 (57.2)	 43 (31.4) 80 (49.4) 83 (45.1) 62 (42.8)	 87 (65.4) 79 (54.5) 99 (57.2) 77 (52.7)	 46 (34.6) 66 (45.5) 74 (42.8) 69 (47.3)	 85 (64.9) 83 (58.5) 90 (53.9) 75 (54.4)	 46 (35.1) 59 (41.6) 77 (46.1) 63 (45.7)	 83 (68.0) 73 (51.8) 85 (52.8) 74 (55.2)	 39 (32.0) 68 (48.2) 76 (47.2) 60 (44.8)	 1.00 2.66 (1.38, 5.11) 2.55 (1.44, 4.52) 2.56 (1.22, 5.37)
12-item Short Form Health Survey – Mental <=36 >=37	 353 (57.4) 7 (50.0)	 262 (42.6) 7 (50.0)	 335 (57.5) 7 (46.7)	 248 (42.5) 8 (53.3)	 325 (57.5) 8 (57.1)	 240 (42.5) 6 (42.9)	 304 (55.9) 11 (73.3)	 240 (44.1) 4 (26.3)	P=0.88 1.00 0.91 (0.27, 3.13)
30 second sit to stands (quartiles) 1 (0-8) 2 (9-10) 3 (11-12) 4 (13-28)	 98 (74.2) 103 (59.5) 88 (52.7) 64 (42.4)	 34 (25.8) 70 (40.5) 79 (47.3) 87 (57.6)	 91 (72.2) 104 (63.0) 75 (46.6) 67 (47.5)	 35 (27.8) 61 (37.0) 86 (53.4) 74 (52.5)	 91 (78.5) 98 (63.2) 75 (47.2) 64 (44.4)	 25 (21.6) 57 (36.8) 84 (52.8) 80 (55.6)	 82 (78.9) 91 (59.9) 72 (46.5) 65 (45.5)	 22 (21.2) 61 (140.1) 83 (53.6) 78 (54.6)	P<0.001 1.00 2.98 (1.62, 5.50) 7.88 (4.17, 14.89) 10.92 (5.32, 22.42)
Timed Up and Go Test (seconds) <13.5 >=13.5	 282 (54.0) 54 (83.1)	 240 (46.0) 11 (16.9)	 274 (54.9) 45 (77.6)	 225 (45.1) 13 (22.4)	 262 (53.9) 47 (83.9)	 224 (46.1) 9 (16.1)	 249 (53.2) 46 (85.2)	 219 (46.8) 8 (14.8)	P<0.001 1.00 0.09 (0.04, 0.19)

FaME: Falls Management Exercise Programme
OEP: Otago Exercise Programme

Table 4. Associations between continuous factors and achievement of physical activity target between 6 and 24 months after the end of the intervention and univariate odds ratios

Characteristics	6 months post intervention		12 months post intervention		18 months post intervention		24 months post intervention		Univariate odds ratio across all time points (95%CI)*
	No	Yes	No	Yes	No	Yes	No	Yes	
Age Median (IQR) Mean (SD)	 73 (69, 78) 73.9 (6.2)	 70 (67, 74) 71.1 (4.9)	 72.5 (68, 77) 73.3 (5.9)	 70 (67, 75) 71.2 (5.2)	 72 (68, 77) 73.4 (5.9)	 69.5 (67, 74) 70.8 (4.9)	 72 (68, 77) 73.0 (5.9)	 70 (67, 73) 70.8 (5.2)	P<0.001 0.86 (0.82, 0.90)
BMI Mean (SD)	 26.5 (5.0)	 26.6 (4.5)	 26.4 (4.9)	 26.8 (4.8)	 27.0 (5.3)	 25.7 (4.0)	 26.8 (4.8)	 26.1 (4.6)	P=0.15 0.97 (0.92, 1.01)
Number of co-morbidities Median (IQR) Mean (SD)	 2 (1,3) 2.0 (1.7)	 2 (1,3) 1.9 (1.5)	 2 (1,3) 2.0 (1.6)	 2 (1,3) 1.9 (1.6)	 2 (1,3) 2.1 (1.7)	 2 (1,3) 1.7 (1.4)	 2 (1,3) 2.1 (1.6)	 2 (1,3) 1.7 (1.5)	P=0.04 0.84 (0.71, 0.99)
Number of medications Median (IQR) Mean (SD)	 3 (1,6) 3.9 (3.1)	 3 (1,5) 3.5 (2.9)	 3 (1,6) 3.8 (3.0)	 3 (1,5) 3.5 (3.1)	 4 (2,6) 4.0 (3.0)	 3 (1,5) 3.1 (2.9)	 4 (2,6) 4.0 (3.0)	 3 (1,4) 3.0 (2.7)	P=0.002 0.87 (0.80, 0.95)
Older people's quality of life Mean (SD)	 130.4 (12.4)	 133.5 (13.4)	 129.8 (12.50)	 134.0 (13.4)	 130.1 (13.0)	 134.1 (12.8)	 129.8 (12.8)	 134.8 (12.6)	P<0.001 1.05 (1.02, 1.07)
Lubben Social Network Scale Mean (SD)	 15.9 (5.6)	 17.2 (5.6)	 16.0 (5.7)	 16.9 (5.4)	 15.8 (5.7)	 17.2 (5.3)	 15.4 (5.6)	 17.4 (5.5)	P<0.001 1.09 (1.04, 1.14)
Multidimensional Scale of Perceived Social Support Median (IQR) Mean (SD)	 69 (57, 78) 65.9 (15.5)	 72 (60,80) 68.3 (15.7)	 69 (58, 79) 66.4 (15.9)	 71 (59, 78) 67.0 (15.5)	 69 (57, 79) 66.1 (15.9)	 72 (60, 80) 67.7 (15.6)	 70 (57, 79) 66.1 (16.0)	 71 (61, 79) 67.5 (15.8)	P=0.16 1.01 (1.00, 1.03)
Falls risk assessment tool Median (IQR) Mean (SD)	 1 (0,1) 0.9 (0.9)	 1 (0,1) 0.8 (0.8)	 1 (0,1) 0.9 (0.9)	 1 (0,1) 0.8 (0.9)	 1 (0,1) 1.0 (0.9)	 0 (0,1) 0.6 (0.8)	 1 (0,1) 1.0 (0.9)	 0 (0,1) 0.7 (0.8)	P<0.001 0.58 (0.42, 0.78)
Functional reach (cm)									P<0.001

Mean, SD	24.8 (7.2)	27.8 (7.0)	25.3 (7.5)	27.4 (6.7)	24.9 (7.2)	28.4 (7.0)	24.7 (7.1)	28.1 (6.7)	1.16 (1.07, 1.16)
Romberg static balance test									P<0.001
Median (IQR)	21 (17,26)	24.5 (20,26)	21 (17,26)	24 (20,26)	21 (18,26)	25 (20,26)	21 (18,26)	24 (20,26)	1.15 (1.10, 1.20)
Mean (SD)	20.6 (5.9)	22.7 (4.7)	20.6 (6.0)	22.3 (4.7)	20.5 (5.8)	23.1 (4.4)	20.9 (5.7)	22.6 (4.7)	
Outcome and Expectation for Exercise (positive)									P<0.001
Median (IQR)	3.9 (3.4, 4)	4 (3.6, 4.3)	3.8 (3.4, 4)	4 (3.7, 4.3)	3.8 (3.4, 4)	4 (3.6, 4.3)	3.9 (3.4, 4.1)	4 (3.6, 4.4)	2.49 (1.72, 3.59)
Mean (SD)	3.8 (0.6)	4.0 (0.6)	3.8 (0.5)	4.0 (0.6)	3.8 (0.6)	4.0 (0.6)	3.8 (0.6)	4.0 (0.6)	
Outcome and Expectation for Exercise (negative)									P<0.001
(Median (IQR)	4 (3.5, 4.3)	4.3 (3.8, 5)	4 (3.5, 4.3)	4.3 (3.8, 5)	4 (3.5, 4.3)	4.3 (4, 5)	4 (3.5, 4.5)	4 (3.8, 5)	2.98 (2.07, 4.29)
Mean (SD)	3.8 (0.8)	4.2 (0.7)	3.9 (0.8)	4.2 (0.7)	3.8 (0.8)	4.2 (0.7)	3.9 (0.8)	4.2 (0.7)	

* OR for one unit change in variable

Where data are not normally distributed and are described with medians and interquartile ranges, means and standard deviations are also presented for ease of interpretation.

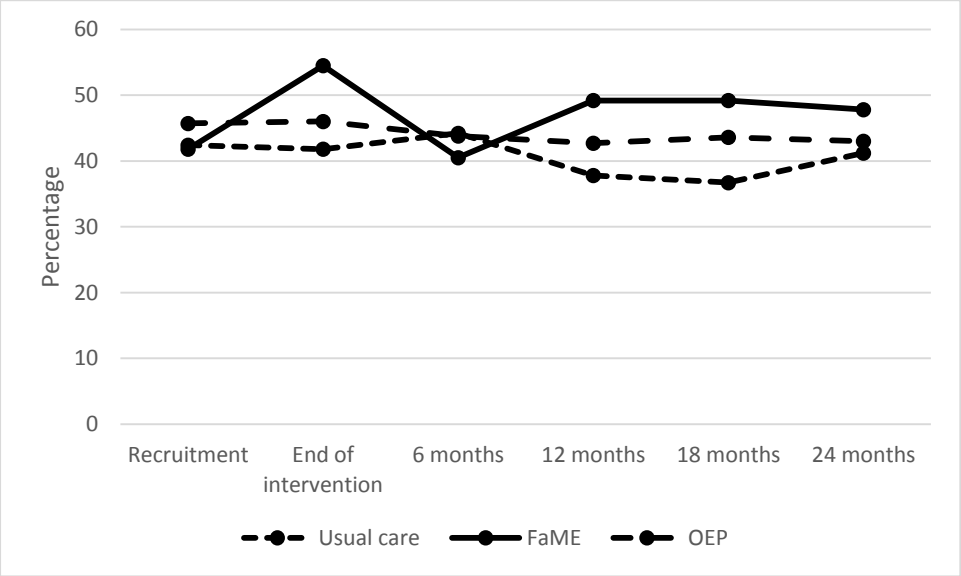
Table 5. Multivariable associations with achievement of physical activity target between 6 and 24 months after the end of the intervention (main effects only).

Characteristics	Odds ratio across all time points (95%CI)*
Time	
6 months	1.00
12 months	0.88 (0.60, 1.28)
18 months	0.88 (0.62, 1.24)
24 months	0.84 (0.61, 1.16)
Age**	0.89 (0.86, 0.93)
Male	1.00
Female	0.47 (0.33, 0.67)
At least 150 minutes MVPA at recruitment†	
No	1.00
Yes	11.28 (7.95, 16.01)
Lubben Social Network Scale**	1.06 (1.03, 1.10)
30 second sit to stands (quartiles)	
1 (0-8)	1.00
2 (9-10)	0.88 (0.52, 1.52)
3 (11-12)	1.87 (1.12, 3.10)
4 (13-28)	1.67 (0.92, 3.05)
Outcome and Expectation for Exercise (negative)**†	1.51 (1.11, 2.05)

*Mutually adjusted for all variables in model. ** OR for one unit change in variable
† Significant interaction between variables is described in the text

Figure(s)

Figure 1. Percentage meeting physical activity target (≥150 minutes moderate to vigorous activity per week) over time, by exercise group



Supplementary table 1. Validated tools used for exposure and outcome measurement

Exposure measures	**Instrument**	**Scale range and interpretation**	**Reference**
Balance Confidence	ConfBal	Scale range 10-30 Lower score indicates greater confidence	Simpson JM, Worsfold C, Hawke J: Balance confidence in elderly people. The CONFbal Scale (abstract 123). *Age and Ageing* 1998, 27(Suppl 2): 57.
Confidence in carrying out basic activities of daily living without falling	Short-FES-I (Falls efficacy scale – international)	Scale range 7-28 Higher score indicates greater concern about falling	Kempen GIJM, Yardley L, Van Haastregt JCM, Zijlstra GAR, Beyer N, Hauer K, et al. The Short FES-I: a shortened version of the falls efficacy scale-international to assess fear of falling. Age Ageing. 2008; 37:45-50
Expectations of exercise	OEE +/- with two sub-scales: positive OEE and negative OEE	Positive and negative subscales, range 1-5 Higher score indicates stronger outcome expectations	Resnik B, Reliability and validity of the Outcome Expectations for Exercise scale-2 J Aging Phys Activity 2005; 13(4): 382-394
Quality of life	OPQOL Older People's Quality of Life Questionnaire	Scale range 33–165 Higher score indicates higher quality of life	Bowling, A., Bannister, D., Sutton, S. et al.: A multidimensional model of QoL in older age. *Ageing and Mental Health* 2002, 6:355-371
Health- related quality of life	SF12	Physical and mental health sub-scales, range 0-100 Higher score indicates better health	Ware, J. E., Kosinsiki, M., & Keller, S. D: A 12-item short-form health survey: Construction of scales and preliminary tests of reliability and validity. Medical Care 1996, 34(3):220-233.
Social network	Lubben Social Network scale	Scale range 0-30 Higher score indicates greater social network	Lubben J, Blozik E, Gillmann G, Iliffe S, von Renteln Kruse W, Beck J Stuck AE: Performance of an abbreviated version of the Lubben Social Network Scale among three European community-dwelling older adult populations. *The Gerontologist* 2006, 46(4):503-513
Perceived social support	MSPSS Multidimensional	Scale range 12-84 Higher score	Zimmet GD, Dahlem NW, Zimet SG, Farley GK: The

	Scale of Perceived Social Support	indicates greater perceived social support	Multidimensional Scale of Perceived Social Support. *Journal of Personality Assessment* 1988, 52:30-41
Falls risk	FRAT Falls Risk Assessment Tool	Scale range 1-5 Higher score indicates greater falls risk	Nandy S, Parsons S, Cryer C, Underwood M, Rashbrook E, Carter Y, Eldridge S, Close J, Skelton D, Taylor S, Feder G, on behalf of the falls prevention pilot steering group: Development and preliminary examination of the predictive validity of the Falls Risk Assessment Tool (FRAT) for use in primary care. *Journal of Public Health* 2004, 26(2):138-143
Outcome measure	**Instrument**	**Scale range**	**Reference**
Subjective habitual physical activity	Community Health Activities Model for Seniors scale (Champs)	Scale 0-maximum number of minutes of moderate to vigorous physical activity	Stewart AL, Mills KM, Sepsis PG, King AC, McLeillan B, Rotz K, Ritter PL: Evaluation of CHAMPS, a physical activity promotion program for older adults. *Annals of Behavioural Medicine* 1997, 19(4):353-61.

Highlights

- Pre-exercise programme physical activity (PA) is strongly associated with PA maintenance
- Wider social networks and greater lower limb strength are associated with PA maintenance
- Not maintaining PA was associated with increasing age and being female
- Negative expectations of exercise in the less active were associated with PA maintenance
- These factors can aid targeting of PA maintenance interventions

Data Statement

Click here to download Data Statement: dataprofile.xml