

Feasibility of a primary care-based adapted physical activity program for older adults with chronic conditions: the CAPA-CITY 70 pilot study

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Abstract

Background

Older adults living with chronic conditions often face major barriers to participating in structured physical activity programs despite the importance of physical activity for healthy ageing. Primary care may offer an appropriate setting for identifying eligible patients and coordinating integrated, person-centred exercise interventions. CAPA-CITY 70 was designed to evaluate the feasibility of a local adapted physical activity (APA) program for adults aged 70 years and older with at least one long-term condition.

Methods

CAPA-CITY 70 was a monocentric, prospective, non-comparative, quasi-experimental pilot study conducted in Toulouse, France. The study used a convenience sampling approach based on referrals from participating general practitioners during the recruitment period. Community-dwelling adults aged 70 years or older with at least one long-term condition were referred by their general practitioner to a 4-month supervised APA program delivered in a dedicated local center. The program was integrated into a primary care pathway and provided without out-of-pocket cost for participants. The primary endpoint was the proportion of included participants who completed the program. Secondary outcomes included adherence, patient and general practitioner satisfaction, and exploratory changes in geriatric assessment, physical activity and quality of life up to 12 months.

Results

Thirty-seven participants were included (mean age 79.1 years; 59.5% women), 30 started the program and 27 completed it. This corresponded to a completion rate of 73.0% among included participants and 90.0% among those who attended at least one session. Adherence was high, with a median completion of 93.8% of proposed sessions. Satisfaction was high among both participants and referring physicians. Exploratory analyses suggested differences over time in chair-stand performance ($p = 0.017$), while differences in self-reported exhaustion did not reach statistical significance ($p = 0.062$). Most other outcomes showed no clear statistically significant changes over time.

Conclusion

This pilot study suggests that a local, primary care-based APA program for older adults with chronic conditions is feasible and acceptable. The findings support larger controlled studies to assess effectiveness, implementation and sustainability.

Background

Population ageing is leading to a rapid increase in the number of older adults living with chronic disease, multimorbidity and progressive functional vulnerability, creating major challenges for healthcare systems worldwide.^{1,2} In this context, maintaining functional capacity and autonomy has become a central objective of geriatric and primary care management.³ Physical activity is now recognized as one of the most effective non-pharmacological interventions for healthy ageing and chronic disease management.⁴ Regular physical activity has demonstrated beneficial effects on mobility, muscle strength, frailty prevention, cardiometabolic health, fall reduction and overall quality of life in older adults.^{5,6}

Adapted physical activity (APA), defined as individualized physical activity tailored to functional capacities, chronic conditions and patient-specific objectives, appears particularly relevant in older adults with multimorbidity and functional limitations.⁶ Several studies have shown that multicomponent exercise interventions combining endurance, balance, mobility and muscle-strengthening exercises may improve physical performance and reduce frailty-related outcomes in older populations.^{6,7} Consequently, physical activity is increasingly considered not only as prevention but also as a true therapeutic intervention integrated into chronic disease care pathways.

However, despite strong evidence supporting its effectiveness, participation in structured physical activity programs remains insufficient among older adults with chronic conditions. The French INSERM collective expert report on physical activity and chronic diseases highlighted multiple barriers limiting implementation and participation in APA programs in routine care.⁸ These barriers concern both healthcare professionals and patients. On the professional side, insufficient training, lack of structured referral pathways and poor knowledge of local APA resources limit prescription and referral practices. On the patient side, transportation difficulties, financial constraints, fear of injury, fatigue, reduced self-confidence, social vulnerability and limited accessibility of nearby adapted structures represent major obstacles to long-term participation.^{9,10} These barriers are particularly relevant in older adults living with multimorbidity and progressive functional decline.

Primary care may constitute a particularly appropriate setting to address these challenges because it combines continuity of care, longitudinal patient follow-up and integration within local territorial healthcare networks.¹¹ General practitioners are ideally positioned to identify physical inactivity, frailty and functional decline early, and to coordinate individualized preventive interventions adapted to the patient's global health status and social environment. Nevertheless, despite increasing institutional support for physical activity prescription in several countries, implementation remains heterogeneous and insufficiently operationalized in routine primary care practice.¹²

Beyond physical performance outcomes alone, the expected benefits of adapted physical activity in older adults include broader dimensions such as autonomy, social participation, confidence and health-related quality of life.¹³ These dimensions are particularly relevant in primary care because they align with a holistic and patient-centered approach to chronic disease management.¹⁴

CAPA-CITY 70 was developed in response to these implementation challenges as a territorial, primary care-based adapted physical activity model targeting community-dwelling adults aged 70 years and older living with at least one long-term condition. The program was specifically designed to address several barriers identified previously through three major organizational components: referral by the patient's general practitioner, delivery in a nearby adapted physical activity center integrated within the local healthcare territory, and full financial coverage without out-of-pocket costs for participants. The primary objective of this pilot study was to assess the feasibility of this model. Secondary objectives were to assess adherence and satisfaction and to explore changes in global health, physical activity and quality of life over follow-up.

Methods

Study design

CAPA-CITY 70 was a prospective, monocentric, non-comparative, quasi-experimental pilot feasibility study conducted in Toulouse, France. This design was chosen because the primary aim was to evaluate feasibility before undertaking a larger effectiveness study.

Setting

The study was coordinated through an academic multidisciplinary primary care center in Toulouse (southwest France) partnership with a dedicated APA center located within the same local health area. The intervention was designed as a neighborhood-based primary care pathway linking general practitioners and APA professionals.

Participants

Eligible participants were community-dwelling adults aged 70 years or older, living in the Toulouse metropolitan area, benefiting from reimbursement for at least one long-term condition, and having a general practitioner practicing in Toulouse within a 3 km radius of the participating academic primary care center. Participants had to provide informed consent and be affiliated with a social security scheme or equivalent.

Exclusion criteria were residence in an institution such as a nursing home, dependency in basic activities of daily living defined by a Katz score below 5.5, major cognitive impairment according to DSM-5 criteria, current participation in another research project or APA program, medical contraindication to physical activity, or legal protection status.

Intervention

Participants were referred to a 4-month supervised APA program delivered in the CAPA-CITY centre. Sessions were supervised by adapted physical activity teachers and tailored to older adults with chronic conditions in a secure setting. Up to 48 sessions could be proposed over the intervention period, and the number of completed, cancelled and postponed sessions was recorded.

The program was organized within a local primary care network and provided without out-of-pocket cost for participants. These features were intended to reduce logistical and financial barriers to participation.

Outcomes

The primary outcome was program feasibility, defined as the proportion of included participants who completed the program regardless of the exact number of sessions attended.

Secondary outcomes were as follows:

- program implementation indicators, including the number of participants starting the program, session organization metrics, and data collection completeness;
- adherence, assessed through the number and proportion of sessions attended relative to those proposed;
- patient satisfaction at month 12, assessed using a study-specific Likert-scale questionnaire;
- general practitioner satisfaction; The questionnaire used in this study was specifically developed for the CAPA-CITY 70 pilot study. The English version is provided as Additional file 1.
- exploratory clinical outcomes from standardized geriatric assessment at baseline, month 4 and month 12;
- physical activity and quality of life assessed at baseline, month 4, month 6 and month 12 using the GPAQ, Ricci-Gagnon questionnaire and WHOQOL-BREF.

Statistical analysis

Baseline characteristics were described in all included participants program implementation metrics in those who started the program, and follow-up outcomes in those with month-12 follow-up. Feasibility and satisfaction were analyzed descriptively. Exploratory repeated-measures analyses used Cochran's Q test for qualitative variables and Friedman's rank test for quantitative variables. These analyses were exploratory, and no adjustment for multiple comparisons was applied.

Ethical considerations

The study was approved by the CPP OUEST II ethics committee on 28 October 2020 and registered on ClinicalTrials.gov (NCT04644861). The study identification number was 2020-A01164-35.

Results

Participant flow and baseline characteristics

Between 14 December 2020 and 14 December 2021, 37 participants were included, and the final follow-up visit took place on 21 February 2023. Of these, 30 started the program, 27 completed the 4-month intervention and 25 completed 12-month follow-up.

Mean age at baseline was 79.1 years (SD 5.86), 59.5% of participants were women, the mean number of long-term conditions was 1.6 (SD 0.65), and the mean number of medical history items was 4.3 (SD 1.58). The most frequent long-term conditions were malignant tumor (40.5%), severe heart disease (32.4%), coronary disease (24.3%) and type 2 diabetes (16.2%) (table 1).

Table 1. Baseline characteristics of participants

Characteristic	Total population (n=37)
Age, mean (SD (range), years	79.1 (5.9 (70–90)
Women, n (%)	22 (59.5)
Number of medical conditions, mean (SD)	4.3 (1.6)
Number of long-term conditions, mean (SD)	1.6 (0.7)
Malignant tumor, n (%)	15 (40.5)
Severe heart disease*, n (%)	12 (32.4)
Coronary artery disease, n (%)	9 (24.3)
Type 2 diabetes, n (%)	6 (16.2)
Chronic arterial disease, n (%)	4 (10.8)
Chronic respiratory disease, n (%)	3 (8.1)

*Severe heart failure, severe arrhythmia or severe valvular heart disease.

Feasibility and adherence

The primary feasibility endpoint was reached in 27 of 37 included participants, corresponding to a completion rate of 73.0%. Among participants who attended at least one session, the completion rate was 90.0% (table 2).

Among the 30 participants who started the program, the mean number of completed sessions was 37.0 (SD 14.89), and the median proportion of completed sessions among those proposed was 93.8% (IQR 83.3–97.9). Five participants completed all proposed sessions, 17 completed at least 90% of sessions, and 23 completed at least 75% of sessions.

Twelve participants (over 37) exited the study prematurely: five because of medical complications, four were lost to follow-up, two refused further participation and one was physically unable to complete the program. Participants who did not complete follow-up were more likely to have a malignant tumor at inclusion than those who completed follow-up (66.7% vs 28.0%, $p=0.041$).

Regarding data collection feasibility, 25 of 37 case report forms were completed for more than 80% of clinical evaluation criteria, but only 3 of these 25 had fewer than 20% data-quality errors according to the study report definition.

Table 2. Feasibility and adherence outcomes

Outcome	Result
Participants included, n	37
Participants starting the APA program, n (%)	30 (81.1)
Participants completing the 4-month program, n (%)	27 (73.0)
Participants completing 12-month follow-up, n (%)	25 (67.6)
Mean number of sessions completed (SD)	37.0 (14.9)
Median proportion of completed sessions (IQR), %	93.8 (83.3–97.9)
Participants completing $\geq 75\%$ of sessions, n (%)	23 (76.7)
Participants completing $\geq 90\%$ of sessions, n (%)	17 (56.7)

Satisfaction

Satisfaction with the program was high among participants. At month 12, 91.7% of respondents rated program organization as good or very good, and 79.2% rated the benefits obtained at the end of the program as high or very high. Most respondents reported no difficulties during participation.

Free-text comments highlighted perceived safety, staff support, improved mobility or balance, and the wish to continue the program. Reported difficulties concerned group heterogeneity, facility accessibility and some equipment-related issues.

General practitioner feedback was also favorable. Five general practitioners participated in the study, and all five completed the satisfaction questionnaire. Four of the five responding physicians rated referral procedures as very good (80%), four rated communications with program staff as very satisfactory, and four stated with certainty that they would refer future patients to the program.

Exploratory health, physical activity and quality-of-life outcomes

Exploratory analyses suggested differences over time in chair-stand performance ($p=0.017$). Mean chair-stand scores were 2.9 (SD 1.1) at baseline, 3.6 (SD 0.6) at the second assessment, and 3.7 (SD 0.7) at

the final assessment. Differences over time in self-reported exhaustion did not reach statistical significance ($p=0.062$); the proportion of participants reporting exhaustion was 48.0% at baseline, 26.1% at M4, and 33.3% at M12.

No clear statistically significant changes were observed for most other geriatric assessments, physical activity, or quality-of-life indicators (Table 3). Differences over time were observed for the WHOQOL-BREF social relationships domain ($p=0.041$), with mean scores of 60.8 (SD 22.6), 55.7 (SD 20.1), 59.8 (SD 15.6), and 52.7 (SD 15.3) across the four assessment time points. The other quality-of-life domains remained broadly stable (Table 4).

Table 3. Standardized geriatric assessment outcomes at baseline (M0), month 4 (M4), and month 12 (M12)

	M0	M4	M12	P-value
Outcome				
ADL (/6)	5.8 (0.4) [25]	5.6 (0.5) [15]	5.8 (0.5) [4]	—
IADL (/8)	7.4 (0.9) [25]	7.5 (0.7) [13]	7.3 (0.6) [3]	—
MMSE (/30)	28.2 (2.4) [25]	28.1 (2.1) [15]	26.4 (3.3) [5]	—
MNA (/14)	12.2 (1.9) [25]	11.9 (2.0) [21]	11.9 (2.0) [17]	—
Mini-GDS (/4)	1.0 (1.1) [24]	0.6 (1.0) [15]	0.9 (1.0) [8]	—
SPPB balance (/4)	3.3 (1.3) [23]	3.7 (0.6) [22]	3.8 (0.6) [20]	0.261
SPPB gait speed (/4)	3.7 (0.6) [25]	3.8 (0.4) [23]	3.9 (0.3) [20]	0.211
SPPB chair-stand (/4)	2.9 (1.1) [25]	3.6 (0.6) [23]	3.7 (0.7) [20]	0.017
Unintentional weight loss*	3 (12.0) [25]	0 (0.0) [25]	2 (9.5) [21]	0.25
Self-reported exhaustion*	12 (48.0) [25]	6 (26.1) [23]	7 (33.3) [21]	0.062
Slow gait speed*	5 (20.0) [25]	4 (17.4) [23]	1 (4.8) [20]	0.112
Reduced muscle strength*	3 (12.0) [25]	3 (13.0) [23]	2 (9.5) [21]	1.00
Sedentary behaviour*	6 (24.0) [25]	2 (9.1) [22]	3 (14.3) [21]	0.312
One-leg stand >5s*	19 (76) [25]	18 (85.7) [22]	15 (83.3) [20]	0.612
Lean body mass (kg)	7.0 (3.9) [22]	6.8 (4.1) [21]	6.5 (3.7) [14]	0.511
Fat mass (kg)	22.5 (8.2) [22]	22.9 (7.6) [21]	26.5 (7.6) [14]	0.351
BMI (kg/m ²)	26.2 (4.3) [25]	26.1 (4.2) [23]	27.1 (4.1) [14]	0.371

* : Qualitative variables: n (%) [N non missing], p -value for Cochran's Q test

Quantitative variables: mean (SD) [N non missing], p-value for Friedman's rank test

—: statistical comparison not performed due to insufficient sample size

Abbreviations: ADL, Activities of Daily Living; IADL, Instrumental Activities of Daily Living; MMSE, Mini Mental State Examination; MNA, Mini Nutritional Assessment; Mini-GDS, Mini Geriatric Depression Scale; SPPB, Short Physical Performance Battery;

Table 4. Physical activity and quality-of-life outcomes at baseline (M0), month 4 (M4), month 6 (M6), and month 12 (M12)

	M0 (n=25)	M4 (n=25)	M6 (n=25)	M12 (n=25)	P-value
Outcome					
GPAQ low activity level*	10 (40.0) [25]	5 (20.8) [24]	11 (47.8) [23]	11 (45.8) [24]	0.542
GPAQ moderate activity level*	11 (44.0) [25]	13 (54.2) [24]	8 (34.8) [23]	11 (45.8) [24]	
GPAQ high activity level*	4 (16.0) [25]	6 (25.0) [24]	4 (17.4) [23]	2 (8.3) [24]	
Ricci–Gagnon score (/45)	20.9 (7.8) [25]	23.4 (8.7) [24]	22.0 (8.6) [24]	21.4 (7.7) [24]	0.611
WHOQOL-BREF physical health domain (/100)	55.6 (16.8) [25]	55.9 (13.0) [24]	52.1 (12.7) [24]	49.1 (13.8) [24]	0.641
WHOQOL-BREF psychological domain (/100)	62.6 (16.2) [25]	64.4 (16.8) [24]	61.8 (18.6) [24]	63.1 (13.6) [24]	0.191
WHOQOL-BREF social relationships domain (/100)	60.8 (22.6) [25]	55.7 (20.1) [24]	59.8 (15.6) [24]	52.7 (15.3) [24]	0.041
WHOQOL-BREF environment domain (/100)	73.4 (14.4) [25]	72.1 (12.7) [24]	70.9 (13.8) [24]	67.9 (11.9) [24]	0.501

*: Qualitative variables: n (%) [N non missing], p-value for Cochran's Q test

Quantitative variables: mean (SD) [N non missing], p-value for Friedman's rank test

Abbreviations: GPAQ, Global Physical Activity Questionnaire.

Discussion

This pilot study suggests that a territorial primary care-based adapted physical activity program for adults aged 70 years and older with chronic conditions is both feasible and acceptable. The study specifically explored an implementation model designed to address barriers commonly reported in the literature regarding access to physical activity interventions in older adults with multimorbidity.

The main contribution of CAPA-CITY 70 lies in the practical organization of a coordinated local care pathway combining general practitioner referral, neighborhood-based delivery and full financial coverage. Several reports and international studies have highlighted that barriers to participation in physical activity programs among older adults are often multifactorial and involve transportation constraints, accessibility issues, financial burden, low confidence, fear of injury and insufficiently individualized supervision.^{9,10,16-18} The INSERM expert report on physical activity and chronic diseases also emphasized the lack of structured and territorially integrated pathways as a major limitation to implementation in routine care.⁸ CAPA-CITY 70 was specifically designed to respond to these barriers through integration within a local primary care network and by providing supervised sessions without out-of-pocket cost. Ecological models of health behaviour also suggest that long-term participation in physical activity depends not only on individual motivation but also on healthcare organization, territorial accessibility and environmental support.¹⁹

The adherence observed in our population is therefore particularly noteworthy given the advanced age and morbidity burden of participants. Among participants who attended at least one session, 90% completed the intervention and adherence to proposed sessions was high. Adherence to exercise interventions is usually lower in older adults with multimorbidity and frailty because chronic disease burden, fatigue, hospitalization and functional limitations frequently compromise sustained participation.²⁰ Our findings therefore support the hypothesis that territorial accessibility, financial support and close supervision may substantially improve engagement in this population.

The role of supervision and relational support may also be central in explaining adherence. Qualitative comments collected during follow-up suggested that perceived safety, confidence in professionals and individualized adaptation of exercises were major facilitators for continued participation. These findings are consistent with previous qualitative studies showing that older adults value supportive relationships, reassurance and individualized progression more than purely performance-oriented objectives.¹⁶ In primary care settings, such dimensions are especially relevant because they fit the broader framework of person-centred chronic disease management.

Exploratory analyses may suggest an improvement in chair-stand performance over time. However, given the uncontrolled design, small sample size and attrition during follow-up, these findings should be interpreted cautiously and cannot be considered evidence of effectiveness. Improvement in chair-stand performance could suggest potential benefits on lower-limb strength and functional mobility, which are key determinants of autonomy and fall prevention in older adults. Similar benefits have been described in large intervention studies evaluating structured physical activity in vulnerable older adults.^{6,7,21} Preservation of functional capacity is increasingly recognized as a major outcome in ageing populations

because it directly conditions independence and the ability to remain in the community.²² Trends toward reduced exhaustion and improved balance persisted beyond the intervention period, suggesting that some functional gains may remain partially sustained over time even after program completion.

In contrast, physical activity levels appeared to progressively decline after the end of supervised sessions. This observation is important because it highlights one of the major challenges of physical activity promotion in older adults: long-term behavioural maintenance. Several studies have shown that while supervised interventions may temporarily improve activity levels and physical performance, maintaining these benefits after program discontinuation remains difficult.^{18,23} Our findings support the idea that adapted physical activity in older adults may need to be conceptualized not as isolated short-term interventions but rather as longitudinal care pathways integrated into chronic disease management. Future models may therefore require repeated interventions, maintenance sessions or structured transitions toward community-based autonomous physical activity.

Regarding quality-of-life outcomes, most dimensions remained globally stable throughout follow-up. In very old adults living with chronic disease, preservation of quality of life and autonomy may itself represent a clinically relevant outcome given the expected trajectory of age-related functional decline.¹³ The isolated decline observed in the WHOQOL social relationships domain should be interpreted cautiously because participant recruitment and follow-up occurred during the COVID-19 pandemic period, which may have independently affected social interactions and perceived social participation. The COVID-19 pandemic may also have influenced several measured outcomes beyond social relationships, including physical activity patterns, healthcare access and overall wellbeing.

This study also raises important public health and equity issues. The absence of out-of-pocket costs was intentionally integrated into the intervention because financial barriers are known to disproportionately affect participation in preventive interventions among socially vulnerable populations.²⁴ In this perspective, territorial primary care-based APA models may contribute not only to improving physical health outcomes but also to reducing inequalities in access to health-promoting physical activity interventions. Future implementation studies should therefore evaluate scalability, sustainability, equity of access and cost-effectiveness in real-world healthcare systems.

Several limitations should nevertheless be acknowledged. This was a monocentric pilot study with a limited sample size and without a control group, restricting causal interpretation and generalizability. Recruitment was territorially localized and embedded in a specific primary care organization, which may have introduced selection bias. In addition, some follow-up data were incomplete and several analyses remained exploratory. However, the pragmatic nature of the intervention and the integration within routine primary care pathways may also be considered important strengths for future implementation research.

Perspectives for future implementation

This pilot study also identified several areas requiring optimization before larger-scale implementation. Recruitment remained limited and territorially localized, and several difficulties were encountered regarding long-term follow-up and completeness of data collection. In particular, integrating community-based healthcare professionals into a research framework proved challenging. General practitioners and community nurses often face substantial workload constraints, limited research infrastructure and time limitations, which may complicate participation in study procedures and standardized data collection in routine practice. Similar barriers have been described in primary care research, particularly regarding recruitment, coordination and longitudinal data collection in pragmatic studies conducted outside hospital settings.²⁵

Future programs may therefore benefit from simplified data collection procedures, dedicated research support, strengthened coordination with primary care professionals, and the development of pragmatic implementation strategies adapted to routine care. Additional work is also needed to improve long-term maintenance of physical activity after the supervised intervention period and to optimize accessibility for vulnerable older adults.

Overall, CAPA-CITY 70 supports the feasibility of territorially integrated adapted physical activity pathways coordinated through primary care for older adults with chronic conditions. These findings provide a basis for larger controlled studies evaluating effectiveness, implementation strategies and long-term sustainability of such models in routine practice.

Conclusion

A supervised APA program integrated into a local primary care pathway for adults aged 70 years and older with chronic conditions was feasible and acceptable in this pilot study. The combination of general practitioner referral, neighborhood-based delivery and no out-of-pocket cost appears promising for improving access to tailored physical activity in this population. Larger controlled studies are now needed to determine effectiveness, implementation requirements and scalability.

Abbreviations

ADL – Activities of Daily Living

APA – Adapted Physical Activity

BMI – Body Mass Index

CPP – Committee for the Protection of Persons (Comité de Protection des Personnes)

DSM-5 – Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition

GPAQ – Global Physical Activity Questionnaire

ICH-GCP – International Council for Harmonisation Good Clinical Practice

IADL – Instrumental Activities of Daily Living

INSERM – French National Institute of Health and Medical Research

IQR – Interquartile Range

Mini-GDS – Mini Geriatric Depression Scale

MMSE – Mini-Mental State Examination

MNA – Mini Nutritional Assessment

SD – Standard Deviation

SPPB – Short Physical Performance Battery

WHOQOL-BREF – World Health Organization Quality of Life – BREF

Declarations

Ethics approval and consent to participate

The study was conducted in accordance with the Declaration of Helsinki and the International Council for Harmonisation Good Clinical Practice (ICH-GCP) guidelines. It was approved by the CPP OUEST II ethics committee on 28 October 2020 (registration no. 2020/39) and registered on ClinicalTrials.gov (NCT04644861).

Consent for publication

Not applicable

Competing interests

The authors declare that they have no competing interests.

Authors' information (optional)

EE is a general practitioner and academic primary care physician at the Maison de Santé Pluriprofessionnelle Universitaire La Providence (Toulouse, France), with a research focus on adapted physical activity and primary care for older adults.

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Author Contribution

EE conceived the study, acted as principal investigator, supervised its implementation, and contributed to data interpretation and drafting of the manuscript. TR contributed to the implementation and follow-up of the study and performed data analyses. AP contributed to the implementation and follow-up of the study and participated in data analyses. SA provided methodological support. SO contributed to the study design and to the follow-up of the study. All authors read and approved the final version of the manuscript.

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Data Availability

The datasets generated and analysed during the current study are not publicly available because they contain potentially identifiable participant information but are available from the corresponding author on reasonable request, subject to institutional and ethical approval.

References

1. Prince MJ, Wu F, Guo Y, Gutierrez Robledo LM, O'Donnell M, Sullivan R, et al. The burden of disease in older people and implications for health policy and practice. *Lancet*. 2015;385(9967):549–62.
2. Violan C, Foguet-Boreu Q, Flores-Mateo G, Salisbury C, Blom J, Freitag M, et al. Prevalence, determinants and patterns of multimorbidity in primary care: a systematic review of observational studies. *PLoS ONE*. 2014;9(7):e102149.
3. World Health Organization. World report on ageing and health. Geneva: World Health Organization; 2015.
4. Bull FC, Al-Ansari SS, Biddle S, Borodulin K, Buman MP, Cardon G, et al. World Health Organization 2020 guidelines on physical activity and sedentary behaviour. *Br J Sports Med*. 2020;54(24):1451–

5. Cunningham C, O'Sullivan R, Caserotti P, Tully MA. Consequences of physical inactivity in older adults: a systematic review of reviews and meta-analyses. *Scand J Med Sci Sports*. 2020;30(5):816–27.
6. Izquierdo M, Merchant RA, Morley JE, Anker SD, Aprahamian I, Arai H, et al. International exercise recommendations in older adults (ICFSR): expert consensus guidelines. *J Nutr Health Aging*. 2021;25(7):824–53.
7. Dent E, Morley JE, Cruz-Jentoft AJ, Arai H, Kritchevsky SB, Guralnik J, et al. Physical frailty: ICFSR international clinical practice guidelines for identification and management. *J Nutr Health Aging*. 2019;23(9):771–87.
8. Institut national de la santé et de la recherche médicale (INSERM). Physical activity: prevention and treatment of chronic diseases. Montrouge: EDP Sciences; 2019.
9. Bethancourt HJ, Rosenberg DE, Beatty T, Arterburn DE. Barriers to and facilitators of physical activity program use among older adults. *Clin Med Res*. 2014;12(1–2):10–20.
10. Burton E, Farrier K, Lewin G, Pettigrew S, Hill AM, Airey P, et al. Motivators and barriers for older people participating in resistance training: a systematic review. *J Aging Phys Act*. 2017;25(2):311–24.
11. Thornton JS, Fremont P, Khan K, Poirier P, Fowles J, Wells GD, et al. Physical activity prescription: a critical opportunity to address a modifiable risk factor for the prevention and management of chronic disease. *Br J Sports Med*. 2016;50(18):1109–11.
12. Lion A, Vuillemin A, Thornton JS, Theisen D, Stranges S, Ward M. Physical activity promotion in primary care: a Utopian quest? *Health Promot Int*. 2019;34(4):877–86.
13. Makovski TT, Schmitz S, Zeegers MP, Stranges S, van den Akker M. Multimorbidity and quality of life: systematic literature review and meta-analysis. *Ageing Res Rev*. 2019;53:100903.
14. Stange KC. The problem of fragmentation and the need for integrative solutions. *Ann Fam Med*. 2009;7(2):100–3.
15. Picorelli AMA, Pereira LSM, Pereira DS, Felício D, Sherrington C. Adherence to exercise programs for older people is influenced by program characteristics and personal factors: a systematic review. *J Physiother*. 2014;60(3):151–6.
16. Franco MR, Tong A, Howard K, Sherrington C, Ferreira PH, Pinto RZ, et al. Older people's perspectives on participation in physical activity: a systematic review and thematic synthesis of qualitative literature. *Br J Sports Med*. 2015;49(19):1268–76.
17. Baert V, Gorus E, Mets T, Geerts C, Bautmans I. Motivators and barriers for physical activity in older adults with osteoporosis. *J Geriatr Phys Ther*. 2015;38(3):105–14.
18. Boulton E, Horne M, Todd C. Involving older adults in developing physical activity interventions to promote engagement: a qualitative study. *Health Expect*. 2019;22(6):1257–66.

19. Sallis JF, Owen N, Fisher EB. Ecological models of health behavior. In: Glanz K, Rimer BK, Viswanath K, editors. *Health Behavior: Theory, Research, and Practice*. 5th ed. San Francisco: Jossey-Bass; 2015.
20. Hawley-Hague H, Horne M, Skelton DA, Todd C. Review of how we should define (and measure) adherence in studies examining older adults' participation in exercise classes. *BMJ Open*. 2016;6(6):e011560.
21. Pahor M, Guralnik JM, Ambrosius WT, Blair S, Bonds DE, Church TS, et al. Effect of structured physical activity on prevention of major mobility disability in older adults: the LIFE study randomized clinical trial. *JAMA*. 2014;311(23):2387–96.
22. Fielding RA, Rejeski WJ, Blair S, Church T, Espeland MA, Gill TM, et al. The lifestyle interventions and independence for elders study: design and methods. *J Gerontol Biol Sci Med Sci*. 2011;66A(11):1226–37.
23. Ory MG, Smith ML, Mier N, Wernicke MM. The science of sustaining health behavior change: the health maintenance consortium. *Am J Health Behav*. 2010;34(6):647–59.
24. Attwood S, van Sluijs E, Sutton S. Exploring equity in primary-care-based physical activity interventions using PROGRESS-Plus: a systematic review and evidence synthesis. *Int J Behav Nutr Phys Act*. 2020;17(1):60.
25. Hummers-Pradier E, Scheidt-Nave C, Martin H, Heinemann S, Kochen MM, Himmel W. Simply no time? Barriers to GPs' participation in primary health care research. *Fam Pract*. 2008;25(2):105–12.

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