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Efficacy of a Multicomponent Intervention for Frailty or Physical Function in Prefrail or Frail Older Adults: FRAILMERIT Multicenter Clinical Trial

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ABSTRACT

Objectives: Frailty is a common condition in community-dwelling older adults with high health and socioeconomic implications. However, primary care-led randomized trials have been scarcely tested.

Design: Multicenter cluster randomized clinical trial.

Setting and Participants: Two hundred and seventy-three community-dwelling older adults recruited from 12 Spanish primary care centers. Inclusion criteria: independence in basic activities of daily living and either prefrailty/frailty using the frailty phenotype or gait speed < 0.8 m/s.

Methods: Participants were randomized 1:1 by clusters to the intervention or the control group, each cluster being a different primary care center. Intervention: Physical exercise program, nutritional recommendations, and frailty training to primary care professionals. Interventions were conducted based on the guidelines of the "Consensus document on the prevention of frailty in older adults," updated in 2022, from the Spanish Health Ministry. Control: Usual care. Main outcome: Improvement in one category of the frailty phenotype or one point in the Short Physical Performance Battery (SPPB) at 12 and 32 weeks. under Intention-to-treat analysis was conducted.

Results: Mean age 78.1 years, 68.4% female. 25.7% were frail and 74.3% prefrail or with a gait speed lower than 0.8 m/s. The percentage of participants improving the main outcome at week 12 for the intervention and control groups were 70.4% and 49.5%,

The members of FRAILMERIT Study Group are listed in Appendix A.

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respectively, absolute risk reduction (ARR) 20.9% (95% confidence interval [CI] 7.3%–34.5%; $p < 0.01$; $n = 191$), number needed to treat (NNT) 4.8 (95% CI 2.9–13.6). At 32 weeks of follow-up 81.7% and 51.9% of the intervention and control group improved, respectively, ARR 29.8% (95% CI 13.8%–45.7%; $p < 0.001$; $n = 134$), NNT 3.4 (95% CI 2.2–7.2).

Conclusions and Implications: A primary care-led intervention consisting of a physical exercise program, nutritional recommendations, and training in frailty was feasible and effective for improving frailty status or physical function in community-dwelling older adults with prefrailty or frailty.

Trial Registration: clinicaltrial.gov: NCT05002439 (18/JUN/2021)

1 | Introduction

Frailty is a common condition in community-dwelling older adults, with a combined prevalence of 12% and 30% in adults aged 65 years or older and 80 years or older, respectively [1]. According to the Joint Action on frailty ADVANTAGE, this condition is defined as "a progressive, age-related deterioration of physiological systems resulting in a decline in intrinsic capacity reserve, conferring greater vulnerability to stressors and increasing the risk of a range of adverse health outcomes" [2]. This definition has also been adopted by the "Consensus document on prevention of frailty in older people" updated in 2022 by the Health Promotion and Prevention Strategy of the National Health System from the Spanish Health Ministry [3].

Frailty has been associated with mortality [4, 5], disability in basic (BADL) and instrumental (IADL) activities of daily living [6], mobility disability [6], institutionalization [7], hospitalization [8], falls and fractures [9], and poor quality of life [10]. This makes frailty a very high-cost condition for health systems, which includes not only hospital costs [11] but also indirect and primary care costs [12]. A Medicare study of over 6,000,000 people found that frail older adults were more likely to be in the highest cost group and that over 50% of these costs could be avoidable [13]. For all these reasons, combined with the exponential increase in population aging, frailty is becoming one of the major global public health challenges for the 21st century. Frailty has been considered one of the research priorities by the European Union [2], the Spanish Health Ministry [3] and the scientific community [2], and is currently considered the cornerstone of Geriatric Medicine [14].

There is consensus that interventions to prevent functional decline and disability in older adults should focus on the earliest stages of the functional continuum, prefrailty, and frailty [2, 15]. A recent systematic review analyzed the effectiveness of these interventions in preventing the progression of frailty, finding 21 randomized controlled trials (RCT) with 33 different interventions [16]. Effective interventions include group exercises, physical exercise with nutritional supplementation, oral nutritional supplementation alone, and cognitive training [16], with exercise being the most beneficial [17], especially when associated with nutritional interventions [18]. Other beneficial interventions include the use of information and communication technologies [2, 19, 20], medication review and adjustment [2, 3], and management of multimorbidity and geriatric syndromes with actions adjusted to the state of frailty [2, 3, 21–23].

Scientific associations and public health agencies have developed guidelines for the management of frailty [2, 3, 24, 25] and probably even more importantly, governments, and Ministries of Health have designed political strategies aimed at detecting, preventing, and treating frailty [3, 26, 27] based primarily on primary care. However, there are few RCT that have analyzed the efficacy of specific interventions led by primary care in the management of frailty, with unconclusive results [28–32]. Therefore, we proposed to conduct the FRAILMERIT cluster RCT with the hypothesis that the implementation of a primary care-led intervention in prefrail or frail community-dwelling older adults, based on the "Consensus document on the prevention of frailty in older people" updated in 2022 [3] would be effective in improving frailty or physical function.

2 | Methods

2.1 | Trial Design

Multicenter cluster randomized clinical trial with two parallel groups and a ratio of 1:1. The detailed description of the study can be accessed elsewhere [33].

The onset of the COVID-19 pandemic coincided with the planned initiation of our study and significantly affected several operational aspects of the trial. The study could not commence as scheduled, resulting in an 18-month delay in initiation. To address this challenge, an extension was requested and granted by the Instituto de Salud Carlos III (grant provider). Recruitment timelines were subsequently extended, and additional efforts were undertaken to contact potential participants once public health restrictions were lifted. Randomization procedures, data management, and delivery of the intervention remained unaffected. Overall, although the pandemic produced procedural timeline adaptations, the extension was effectively implemented to maintain the integrity of the study and the quality of the data collected.

2.2 | Participants

The study was conducted at 12 primary care centers in Spain, from Albacete ($n = 4$), Madrid ($n = 1$), Barcelona ($n = 3$), Hellín ($n = 2$), La Carlota ($n = 1$), and Tacoronte ($n = 1$). The recruitment was planned between January 1, 2020 and March 31, 2025, although the last participant was included in March 31, 2024. The last follow-up visit was realized on December 23, 2024. The trial ended March 31, 2025.

Inclusion criteria were: (i) age ≥ 70 years, (ii) prefrailty or frailty according to the frailty phenotype [34] or walking speed < 0.8 m/s, (iii) living in the community, (iv) Barthel Index score ≥ 90 [35], (v) ability to perform the physical exercise program,

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Summary

- Key points
  - A primary care-led intervention consisting of a physical exercise program, nutritional recommendations, and team training in frailty is feasible and effective for improving frailty status or physical function in community-dwelling prefrail or frail older adults.
  - One out of 3.4 older adults needs to be included in the intervention program to improve frailty or physical function.
  - There is a persistence of improvement when the intervention is repeated after a discontinuation period.
- Why does this paper matter?
  - Our manuscript presents the main results of the FRAILMERIT study, a randomized clinical trial conducted in 12 primary care centers of Spain.
  - It describes how a primary care-led intervention consisting of a physical exercise program, nutritional recommendations, and primary care training in frailty is feasible and effective for improving frailty status or physical function in community-dwelling older adults with prefrailty or frailty.
  - Programs based on the "Consensus document on the prevention of frailty in older adults" may be applicable to healthcare systems to manage frailty.

(vi) ability to understand the trial procedures and interventions, (vii) informed consent signed by the patient or legal representative. Exclusion criteria were: (i) major contraindications to exercise (severe aortic valve stenosis, myocardial infarction within the previous 6 weeks, venous thromboembolic disease within the previous 6 weeks), (ii) inability to perform the physical tests of the study, (iii) inability to understand the procedures, (iv) active solid organ or hematologic neoplasia other than cutaneous basal cell neoplasia, or life expectancy less than 1 year, and/or (v) scheduled surgical intervention that could interfere with the exercise program.

3 | Interventions

The intervention had three pillars and consisted of a multicomponent physical exercise program, a nutritional intervention program, and a frailty training program, based on the "Consensus document on the prevention of frailty in older adults," updated in 2022 [3]. It was carried out in two 12-week blocks, separated by an 8-week discontinuation period for a total of 32 weeks.

Multicomponent physical exercise program: It consisted of two weekly training sessions for 12 weeks (24 sessions), that were realized twice separated by 2 months discontinuation. Exercise programming was individualized for each participant according to its baseline functional level, comorbidity, and previous exercise experience. The exercise program was performed presentially at the primary care centers in groups of six participants and was led by physiotherapists or exercise experts. The sessions lasted approximately 45 min and were divided into three parts: (i) a warm-up of 10–15 min, (ii) a main part of 20–25 min consisting of a circuit of seven to eight strength and balance exercises [1], performing two to four sets, with eight to 15 repetitions per strength exercise targeting the main muscle groups, with 30 s of rest between sets and exercises, and (iii) a cool-down (5 min) with stretching of the muscles involved in the session. For strength exercises, elastic bands with different loads (5, 15, and 25 kg) and the body's own weight were used. The loads and intensities were adjusted to the capacity to perform a maximum of 30 repetitions per exercise. In addition, participants were encouraged to complete 150–300 min/week of walking to meet the World Health Organization (WHO) minimum recommendations [36]. Figures S1 and S1 present the description, workload and proposed exercises grouped in three sessions, A, B, and C. During the sessions, tracking of musculoskeletal injuries, falls, cardiovascular and neurological events was specifically monitored.

Nutritional intervention: The main objective of the nutritional intervention was to promote and improve participants' daily dietary habits. To implement this intervention, collaborating researchers from the primary care centers of the intervention group were trained. A qualified dietitian–nutritionist provided this training through a training session lasting approximately 2 h on the importance of a healthy diet at the beginning of the intervention. Collaborating researchers from the centers implemented the recommendations to participants. Primary care centers of the intervention group were provided with a digital presentation and leaflets (Figures S1 and S1).

Frailty training program: primary care teams of the intervention group received a two-hour training program on frailty, emphasizing its relevance, detection, tools, and key interventions in addition to nutrition and exercise, as outlined in the "Consensus document on the prevention of frailty in older adults," updated in 2022 (Figure S5 summarizes the recommendations) [3].

Participants in the control group received their usual care from their primary care center team. They were offered a series of general healthy lifestyle recommendations, including physical exercise and nutritional advice.

4 | Outcomes

The main outcome of FRAILMERIT was the improvement in at least one category of the frailty phenotype [37, 38] or one point in the Short Physical Performance Battery (SPPB) [39, 40]. The frailty phenotype originally described by L.P. Fried is the most widely used tool to assess frailty and includes five elements named slow walking speed, low grip strength, low physical activity, exhaustion, and weight loss. Participants were classified as frail or pre-frail according to the original criteria described by L.P. Fried, except for the walking speed criterion, which was considered positive when they walked at a speed of less than 0.8 m/s. The SPPB is one of the most widely used instruments to assess physical function in older adults and comprises three subtests, named balance, walking speed, and the 5-sit-to-stand test. This combined main outcome was measured at baseline, at visit

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2 (3 months), visit 3 (5 months), and visit 4 (8 months). Secondary outcomes of the FRAILMERIT study were the improvement in at least one category of the frailty phenotype and improvement in at least one point in the SPPB separately, the number of hospitalizations during the follow-up for any cause, the number of visits to the emergency department during the follow-up for any cause, changes in the Barthel index as a measure of dependency in basic activities of daily living (BADL), changes in the Lawton index as a measure of dependency in instrumental activities of daily living (IADL), changes in the depression risk measured with the Geriatric Depression Scale from Yesavage (GDS) five items number of falls during follow-up, need of new institutionalization, changes in quality of life (QoL) measured with the EQ-5D-5L instrument, mortality, number of primary care visits during follow-up, change in the number of drugs commonly used from baseline to end of the study, and healthcare costs. In this manuscript, only the combined main outcome has been assessed.

5 | Sample Size

The sample size was calculated to find a 15% difference between groups in the improvement in the main outcome, 20% in the intervention group and 5% in the control group, with an intraclass correlation coefficient of 0.05, α 0.05, 80% power, and a cluster size of 12 (each physician). A 15% dropout rate was assumed. The program http://statulator.com/SampleSize/ss2P.html#headingCalculator was used for the calculation. The final number of participants per group was 145, for a total of 290 participants.

6 | Randomization

Randomization was carried out centrally via computerized means with a 1:1 ratio of primary care centers and was generated by clusters, with each cluster being a different primary care center to avoid cross-contamination. Each primary care center included 24 participants from two different primary care physicians, 12 participants each physician. Participating centers had to recruit 24 participants before randomization was generated to prevent recruitment bias. Randomization ensured that a single primary care center could only be an intervention or control center. Implementation was conducted by the study coordinator who transmitted the allocation to primary care physicians.

7 | Blinding

For this type of study, it is impossible to blind the intervention for both the participant and the healthcare teams at the primary care centers; only the researchers who performed the data analysis and the principal investigator were blinded to the allocation.

8 | Statistical Methods

The analysis was performed by intention to treat (ITT) and per protocol. It was realized by an expert statistician with the help of the by the principal investigator. Relative risk (RR) of achieving the primary endpoint was calculated, with the 95% confidence interval (CI). Absolute risk reduction (ARR) and number needed to treat (NNT) were also calculated with the 95% CI.

To address potential bias due to missing data, we conducted a multiple imputation analysis using the mice package in R. All relevant baseline and clinical variables were included as predictors in the imputation model. After imputation, a binary logistic regression model with a log link was fitted for the outcome of interest in each imputed dataset. Stepwise variable selection was then performed within each dataset using Akaike's information criterion (AIC) to identify the most important predictors. Variables that were selected in the majority of imputed datasets were included in the final model, which was then pooled across imputations using Rubin's rules to obtain overall estimates, 95% CI, and *p*-values.

To determine the persistence of improvement between visits 2 and 4, a delta analysis was performed using a Fisher exact test. It was established whether there was a change between visits 2 and 4 in the main outcome variable: Those who had not improved in the main outcome at visit 2 and had not improved (compared to baseline) at visit 4 were classified as "No–No," those who did improve at visit 2 and maintained their improvement at visit 4 were classified as "Yes–Yes," those who did not improve at visit 2 but did improve at visit 4 were classified as "No–Yes," and finally, those who had improved at visit 2 but had not improved at visit 4 were classified as "Yes–No."

Statistical significance was set at $p < 0.05$. All analyses were performed using R statistical software package (R Foundation for Statistical Computing, Vienna, Austria).

9 | Ethics

This study followed the principles of the Declaration of Helsinki, as well as its subsequent amendments, and was approved by the Ethics Committee of Albacete (number 2019/02/027), on February 26, 2019. Subsequently, the study protocol was approved by the local Ethic Committees of the participating sites. The reporting of the results adheres to the CONSORT guidelines.

10 | Results

Figure 1 presents the flow chart of FRAILMERIT. Three hundred and seventeen participants were enrolled, and 237 were finally randomized from the 12 primary care centers. Eighty participants were excluded for not meeting inclusion criteria. After randomization, 132 participants were allocated to the intervention group and 105 to the control group. One hundred and ninety-one participants finished the first intervention period and had a valid evaluation at 3 months, 98 from the intervention group and 93 in the control group. At the beginning of the second intervention program (Month 5), 154 participants received a third visit, 73 in the intervention group, and 81 in the control group. Finally, 134 participants ended the study (57% of those initially randomized) and received a fourth follow-up visit, 82 in the intervention group and 52 in the control group. Participants who did not complete the final visit ($n = 103$), were more frequently male (38.8% vs. 26.1%;

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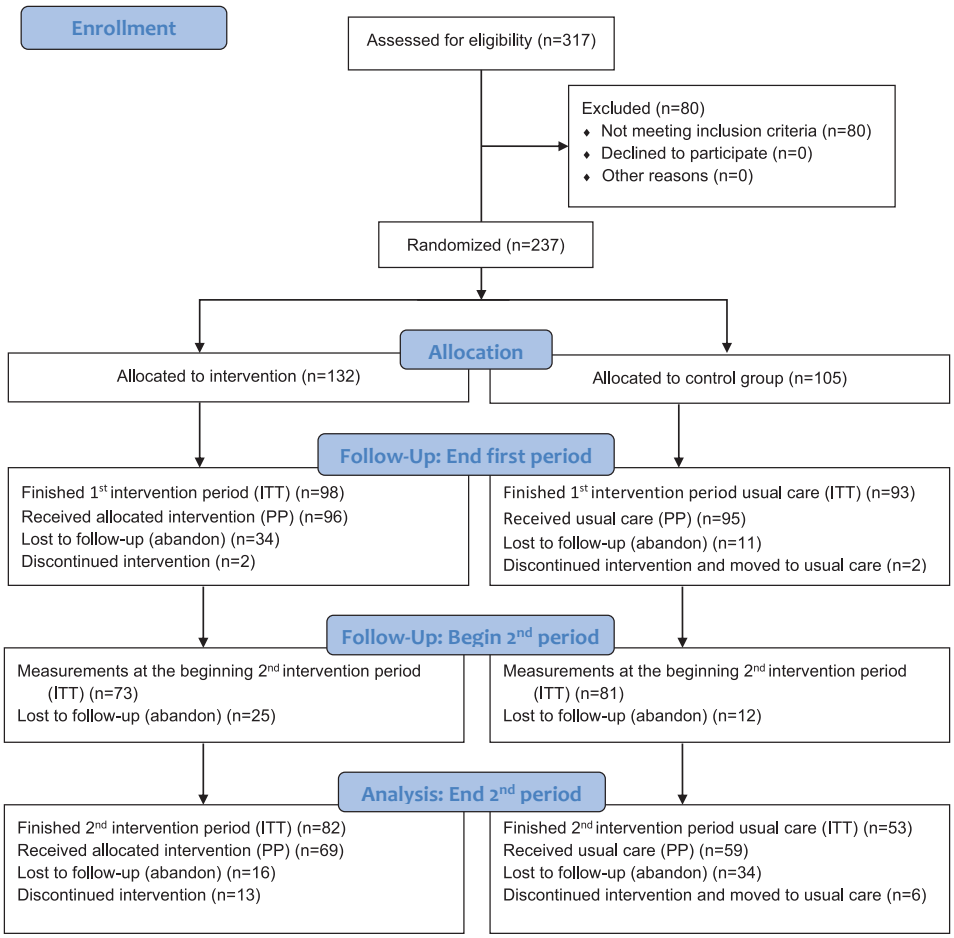


FIGURE 1 | Flow chart of FRAILMERIT.

$p < 0.05$), had a gait speed lower than 0.8 m/s (88.8% vs. 78.6%; $p < 0.05$), and presented a higher Charlson index (1.6 vs. 1.0; $p < 0.01$). No other differences were observed in the rest of the study variables (Table 1).

Table 1 presents the baseline characteristics of the sample. Mean age was 78.1 years old, and 68.4% were female. The study population was very independent in both BADL (mean Barthel index 97 points) and IADL (mean Lawton index 7.4 points), and 84.7% presented a fully independent ambulation assessed with the functional ambulation categories (FAC) scale. However, the scoring of frailty and functional tests reflected a real prefrail or frail population (mean SPPB 7.9, mean gait speed 0.68 m/s, mean number of frailty phenotype criteria 1.7). From the complete sample, 35.5% were frail and 64.5% prefrail. In addition, the population ranged within the category of normonutrition (mean Mini-Nutritional Assessment Short Form or MNA-SF score 12.6 points), and overweight (mean body mass index or BMI 29.7 kg/m^2). Finally, the population presented low comorbidity (mean Charlson index 1.3) but a high number of usually consumed drugs (mean number of drugs 7.6).

Figure 2 presents the percentage of participants improving the main outcome at weeks 12 (visit 2), 20 (visit 3), and 32 (visit 4) for the intervention and control groups. At Week 12, the percentage of participants improving was 70.4% and 49.5%, respectively ($n = 191$), RR for improvement 1.55 (95% CI 1.16–2.06; $p < 0.01$), ARR 20.9% (95% CI 7.3%–34.5%; $p < 0.01$; $n = 191$), NNT 4.8 (95% CI 2.9–13.6). At 20 weeks of follow-up, before the second intervention period, 75.3% and 46.9% in the intervention and control group improved, respectively ($n = 154$), RR 1.73 (95% CI 1.29–2.31; $p < 0.001$; $n = 134$), ARR 28.4% (95% CI 13.7%–43.1%; $p < 0.001$), and NNT 3.5 (95% CI 2.3–7.3). At 32 weeks of follow-up, after the second intervention period, 81.7% and 51.9% in the intervention and control group improved, respectively ($n = 134$), RR 2.18 (95% CI 1.46–3.24; $p < 0.001$; $n = 134$), ARR 29.8% (95% CI 13.8%–45.7%; $p < 0.001$; $n = 134$), and NNT 3.4 (95% CI 2.2–7.2).

Using multiple imputation analysis, at visit 2 the intervention demonstrated an odds ratio (OR) of 2.2 (95% CI 1.2–3.8; $p = 0.07$), remaining the sole variable retained in the model. At visit 3, the OR increased to 2.8 (95% CI 1.4–5.6; $p = 0.004$), with gait speed entering the model. By visit 4, the OR further increased to 3.2 (95% CI 1.4–7.5; $p = 0.009$), with frailty being the sole variable included in the model. In addition, Tables S1 and S2 present the complete results of the per protocol and ITT analysis at visits 2 and 4, respectively. It can be observed that per protocol results are almost equal to ITT results.

Figure 3 presents the change (new improvement or new deterioration) in the main outcome situation between visit 2, at the end of the first intervention period, and visit 4, at the end of the second intervention period. In the control group, 29.6% of the

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TABLE 1 | Baseline characteristics of participants.

	n	Total sample	Completed (*n* = 134)	Not completed (*n* = 103)	Control (*n* = 105)	Intervention (*n* = 132)
Age	237	78.1 (5.2)	77.8 (5.1)	78.5 (5.4)	79.3 (5.2)†	77.1 (5.0)†
Sex						
Female	237	162 (68.4)	99 (73.9)*	63 (61.2)*	70 (66.7)	92 (69.7)
Male		75 (31.6)	35 (26.1)*	40 (38.8)*	35 (33.3)	40 (30.3)
BMI	237	29.7 (12.6)	29.3 (4.9)	30.2 (18.3)	28.1 (4.9)	30.9 (16.3)
Charlson index	237	1.3 (1.5)	1.0 (1.3)†	1.6 (1.7)†	1.5 (0.1)	1.4 (0.1)
Number drugs	237	7.6 (3.9)	7.4 (4.1)	7.9 (3.7)	7.7 (4.3)	7.5 (3.5)
Barthel index	237	97 (4)	97 (4)	97 (4)	98 (4)*	96 (4)*
Lawton index	237	7.4 (1.1)	7.6 (0.9)	7.2 (1.4)	7.4 (0.9)	7.4 (1.3)
FAC = 5	235	199 (84.7)			89 (86.4)	110 (83.3)
SPPB	237	7.9 (2.3)	8.1 (2.2)	7.7 (2.5)	7.9 (2.2)	8.0 (2.4)
MNA-SF	237	12.6 (1.7)	12.7 (1.8)	12.5 (1.7)	12.6 (1.6)	12.6 (1.8)
Frailty phenotype: Frail	237	61 (25.7)	32 (23.9)	29 (28.2)	26 (24.8)	35 (26.5)
Number frailty criteria	237	1.7 (1.2)	1.7 (1.3)	1.8 (1.2)	1.6 (1.2)	1.8 (1.3)
Gait speed (m/s)	237	0.68 (0.19)	0.68 (0.19)	0.68 (0.19)	0.66 (0.18)	0.70 (0.19)
Gait speed < 0.8 m/s	237	200 (84.4)	119 (88.8)*	81 (78.6)*	89 (84.8)	111 (84.1)

Note: All data are means (standard deviation) or number of participants (percentage).
Abbreviations: BMI: body mass index; FAC: functional ambulation category of holden; MNA-SF: Mini-Nutritional Assessment Short Form; SPPB: short physical performance battery.
*$p < 0.05$.
†$p < 0.01$.

participants not improving in visit 2 improved in visit 4, compared to 71.4% in the intervention group. In addition, 76.0% of participants in the control group who had improved in visit 2 maintained the improvement at visit 4, compared to 89.3% of those in the intervention group ($p < 0.001$).

During the RCT period, there were no harms produced by the intervention.

11 | Discussion

The main result of this cluster RCT is that a primary care-led intervention based on the "Consensus document on the prevention of frailty in older adults," updated in 2022 [3], is effective for improving frailty or physical function in community-dwelling prefrail or frail older adults. In addition, the repetition of the intervention after an 8-week discontinuation increases the efficacy observed after the first period and produces a greater persistence of the benefit.

Frailty is usually managed through multicomponent interventions, and although several programs regarding frailty management in primary care are available [24–27], there are few RCT analyzing their efficacy and implementation [28–32], and with unconclusive results. In a recent trial conducted by six primary care practitioners in Ireland, 168 adults aged 65+ (mean age 77) with a Clinical Frailty Scale ≤ 5 received a 3-month home-based exercise regime emphasizing strength and dietary protein guidance (1.2 g/kg/day) intervention. Under an ITT analysis, participants receiving the intervention presented an ARR of frailty of 11.9% (NNT 8.4) [28]. Another trial combining motivational and exercise interventions in 144 participants showed that after 24 weeks, the proportion of pre-frailty was significantly lower in the intervention group than in control with an ARR of 42.8% [30]. However, other trials have not found positive results of complex interventions based on physical exercise and nutrition [31].

Most of these interventions, although primary care-based, have not been conducted in person, and it is well known that the benefits of multicomponent physical exercise in older adults increase when they are conducted on-site, not at home, and led by professionals like physiotherapists or exercise experts [39]. This strategy has been described to improve adherence in older adults [41]. In FRAILMERIT, physical exercise was realized in the primary care centers, in small groups, individualized, and progressive. This may have positively impacted the result of the trial. Moreover, following the recommendations of the Spanish Health Ministry [3] we also included in the intervention a nutrition and frailty training program for primary care teams to provide more aspects where they could intervene depending on the characteristics of participants.

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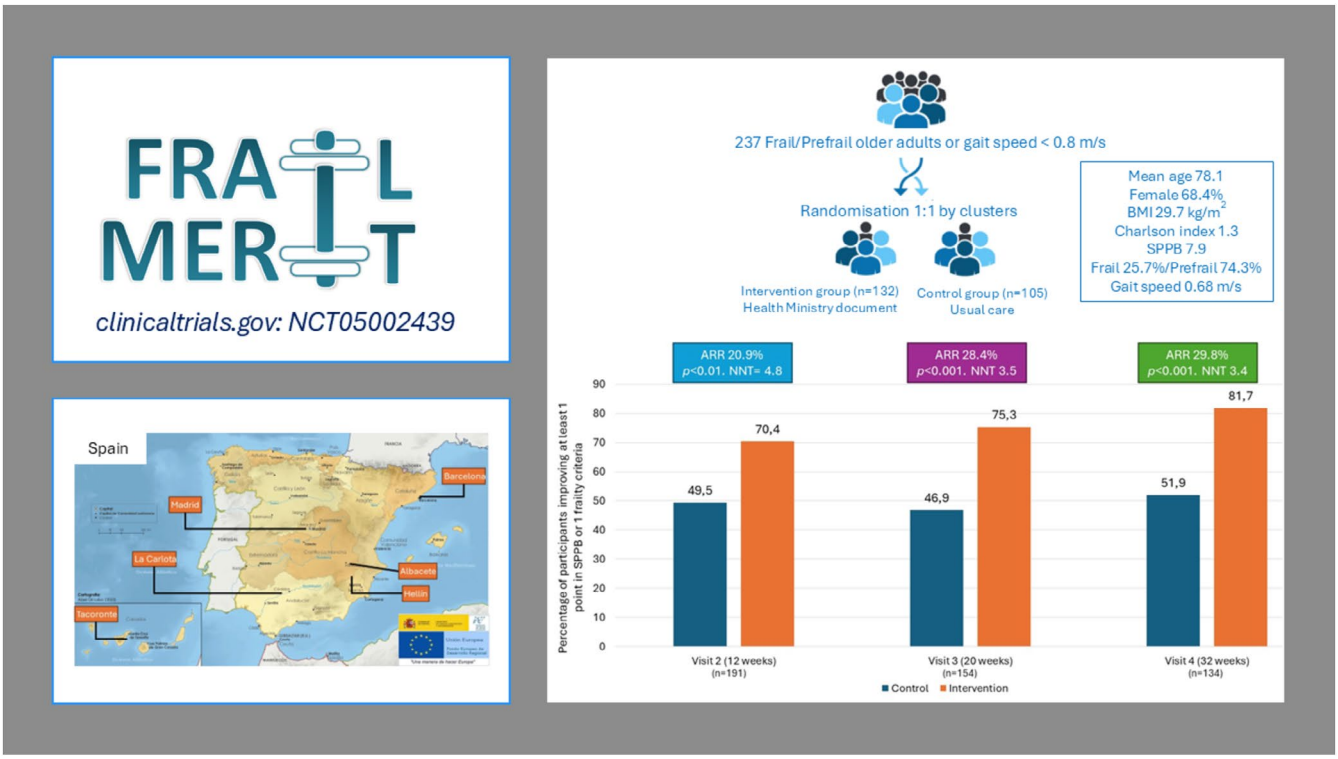


FIGURE 2 | Percentage of participants improving the main outcome at Weeks 12 (visit 2), 20 (visit 3), and 32 (visit 4) for the intervention and control groups.

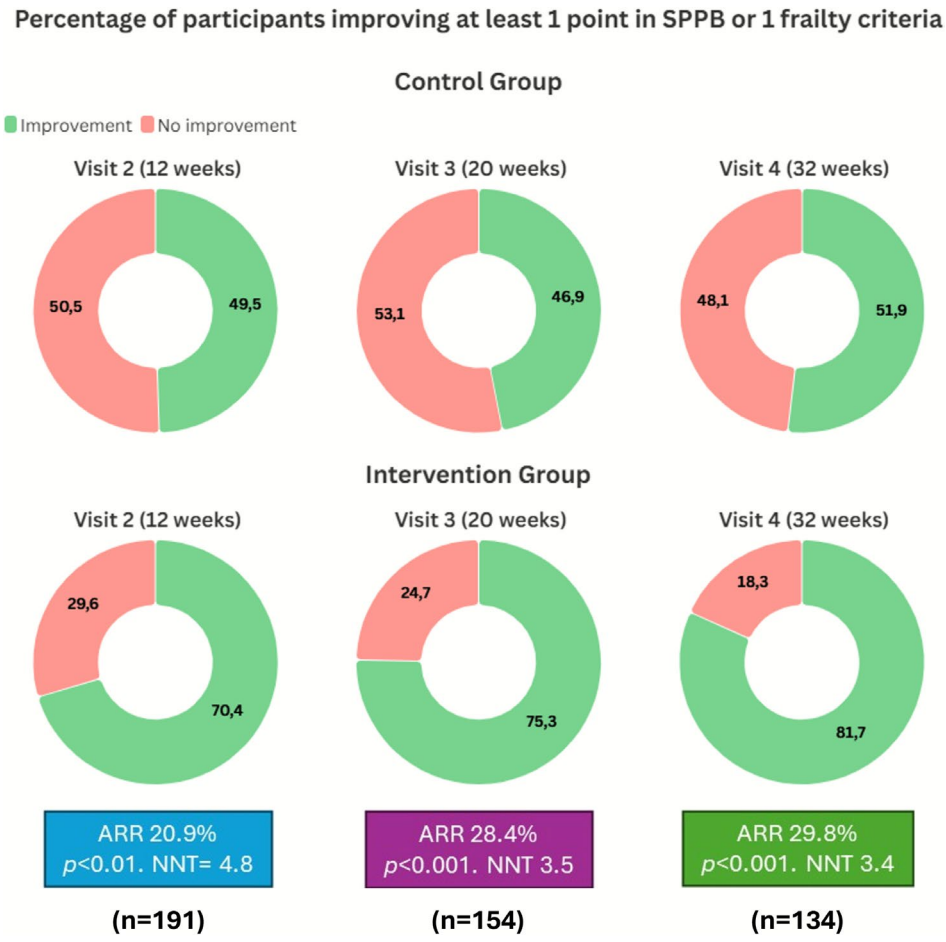


FIGURE 3 | Change (new improvement or new deterioration) in the main outcome situation between visits 2 and 4.

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One of the main strengths of the FRAILMERIT study lies in the implementation of the intervention in two 3-month periods, separated by a 2-month discontinuation interval, which allowed for the analysis of the persistence of the intervention's effects. Few RCT have explored the long-lasting effects beyond the period of intervention. Such trials are difficult to carry out and yet would be important for adoption into routine health and social care systems [42]. Ideally, a long-lasting effect should be possible with behavioral change, supported by community peer-led programs. However, the strongest motivation for older adults would probably be that they feel better after participation, accompanied by gaining an understanding of how aging processes might be slowed down because of the interventions [31]. In FRAILMERIT, we analyzed the long-lasting effect of the intervention through a 3-period assessment methodology. Our results show a clear persistence of the improvement observed in the first intervention period, and an increased improvement after the two periods of intervention.

Among other factors that have been described to be related to the efficiency of interventions in primary care are the efficacy of primary care teams. It has been published that this efficacy decreases the likelihood of hospital admission among frail older adults. For this reason, interventions for delaying frailty should be initiated in primary care along with policies to strengthen their organizational and provider/team-level attributes [43].

The main limitation of the study is the high rate of participants not completing the trial, far more than that accounted for in our power calculation. A global attrition rate of 43% was observed, although this figure was higher in the control group, 50%, compared to 38% in the intervention group. Attrition rates in clinical trials involving physical exercise in older adults represent a significant challenge due to multiple contributing factors, although specific data vary depending on the study design, type of exercise intervention, and characteristics of the population. Attrition rates between 11% and 36% have been reported [44–47]. Factors associated with dropout include lack of motivation and adherence, health-related issues, transportation difficulties, the duration and intensity of the exercise program, and socioeconomic constraints. In our study, the inclusion of frail older adults, the presential primary care implementation of physical exercise, the 8-month program duration, and the lack of motivation interventions may have influenced the high attrition rate.

The second limitation is the external validity outside Spain. The interventions were based on the Spanish Health Ministry recommendations, and these may not be suitable in other countries. For instance, the translation of the intervention to the United States (US) may present several implementation challenges that require careful contextual adaptation. First, to ensure sustained participation, exercise components should be tailored to the functional capacity, comorbidity profile, and environmental context of older US adults. US adaptation may require hybrid formats to overcome barriers related to transportation, climate, and mobility limitations [48]. Digitally supported exercise sessions, using telehealth platforms or wearable devices, may support monitoring and adherence while accommodating rural and mobility-restricted participants [49]. Moreover, considering the heterogeneity of physical activity guidelines and infrastructure across states, the implementation should integrate flexibility for different locations and access to safe walking environments [50]. Second, sociocultural differences in dietary habits and culinary traditions may reduce adherence to the nutritional intervention of our program. The traditional Mediterranean dietary pattern promoted in Spain, rich in olive oil, legumes, and fish, may require modifications to align with local food availability, economic accessibility, and cultural preferences in diverse US populations [51]. Incorporating regionally available equivalents, providing bilingual educational materials, and integrating culturally familiar recipes may enhance acceptability. Third, substantial differences in healthcare delivery systems, including reimbursement models and the level of integration between medical and community-based care, can hinder the scalability of lifestyle interventions. Partnerships between healthcare providers, senior centers, and local health departments can facilitate referral pathways and community uptake [48]. Fourth, behavioral and lifestyle adaptation strategies are essential to address differences in motivation, social support, and daily routines. Evidence suggests that incorporating behavior change techniques such as goal setting, motivational interviewing, and social reinforcement enhances long-term adherence among older adults [52, 53]. Community engagement, peer-led components, and family involvement are also effective in reinforcing lifestyle modifications. Finally, regulatory and ethical frameworks differ between countries, requiring alignment with US institutions and state-specific health codes. Environmental and contextual factors, such as urban infrastructure, safety, and socioeconomic disparities, must be considered to ensure equitable access and sustainability. Overall, the successful implementation of this Spanish model in the US depends on a systematic process of cultural, structural, and behavioral adaptation, supported by intersectoral collaboration and continuous community feedback [54]. After these considerations, it may appear difficult to incorporate our intervention to different healthcare systems. However, the recommendations are based on an international literature review conducted by the Health Ministry working group and are similar to others realized in different countries [28–32].

12 | Conclusions and Implications

A primary care-led intervention based on the guidelines of the "Consensus document on prevention of frailty in older people" updated in 2022 by the Health Promotion and Prevention Strategy of the National Health System from the Spanish Health Ministry, consisting of a physical exercise program, nutritional recommendations, and training in frailty is effective for improving frailty status or physical function in community-dwelling prefrail or frail older adults. One out of 3.4 older adults needs to be included in the intervention program to improve frailty or physical function, and there is a persistence of improvement when the intervention is repeated after a discontinuation period.

Author Contributions

Pedro Abizanda and **Adriana Abizanda Saro:** design of the work, data interpretation, drafting of the work, final approval of the version to be published, agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. **Elisa Belén Cortés Zamora**, **Almudena Avendaño Céspedes**,

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Rubén Alcantud Córcoles, **Rafael García Molina**, and **Marta Sáez Blesa:** data acquisition, drafting of the work, final approval of the version to be published, agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. **Manuel Maestre Moreno**, **Raúl Sánchez Uceda**, **Ignacio Morón Merchante**, **Antonio Aragonés Jiménez**, **María Dolores González Céspedes**, **Pilar Montero Alía**, **Marta Simarro Rueda**, **Luis Torres Antón**, **Pilar Martínez García**, **Humberto Soriano Fernández**, **Marta Córcoles García**, **Ángel Moises Reyes Abreu**, **María Nuria Morcillo González**, **Elena García Páez**, **Beatriz Rodríguez Sánchez**, and **FRAILMERIT Study Group*:** data acquisition, final approval of the version to be published, agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. **Fernando Andrés Pretel:** statistics, final approval of the version to be published, agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. All authors had a role in writing the final manuscript and approved the final version.

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Conflicts of Interest

The authors declare no conflicts of interest.

References

1. R. O'Caoimh, D. Sezgin, M. R. O'Donovan, et al., "Prevalence of Frailty in 62 Countries Across the World: A Systematic Review and Meta-Analysis of Population-Level Studies," *Age and Ageing* 50 (2021): 96–104.

2. A. Rodríguez-Laso, Updated State of the Art Report on the Prevention and Management of Frailty Joint Action '724099/ADVANTAGE' (Health Programme of the European Union, 2019), https://www.advantageja.eu/images/SoAR-AdvantageJA_Fulltext.pdf.

3. Ministerio de Sanidad, *Actualización del Documento de Consenso Sobre Prevención de la Fragilidad en la Persona Mayor (2022)* (Ministerio de Sanidad, 2022), https://www.sanidad.gob.es/profesionales/saludPublica/prevPromocion/Estrategia/EnvejecimientoSaludable_Fragilidad/docs/ActualizacionDoc_FragilidadyCaidas_personamayor.pdf.

4. G. Kojima, "Frailty Index as a Predictor of Mortality: A Systematic Review and Meta-Analysis," *Age and Ageing* 13 (2017): 1–8.

5. E. O. Hoogendijk, L. Romero, P. M. Sánchez-Jurado, et al., "A New Functional Classification Based on Frailty and Disability Stratifies the Risk for Mortality Among Older Adults: The FRADEA Study," *Journal of the American Medical Directors Association* 20 (2019): 1105–1110.

6. P. Abizanda, "Frailty and Mortality, Disability and Mobility Loss in a Spanish Cohort of Older Adults: The FRADEA Study," *Maturitas* 74 (2013): 54–60.

7. G. Kojima, "Frailty as a Predictor of Nursing Home Placement Among Community-Dwelling Older Adults: A Systematic Review and Meta-Analysis," *Journal of Geriatric Physical Therapy* 41 (2018): 42–48.

8. G. Kojima, "Frailty as a Predictor of Hospitalisation Among Community-Dwelling Older People: A Systematic Review and Meta-Analysis," *Journal of Epidemiology and Community Health* 70 (2016): 722–729.

9. M. H. Cheng, "Frailty as a Risk Factor for Falls Among Community Dwelling People: Evidence From a Meta-Analysis," *Journal of Nursing Scholarship* 49 (2017): 529–536.

10. G. Kojima, "Association Between Frailty and Quality of Life Among Community-Dwelling Older People: A Systematic Review and Meta-Analysis," *Journal of Epidemiology and Community Health* 70 (2016): 716–721.

11. I. García-Nogueras, "Use of Health Resources and Healthcare Costs Associated With Frailty: The FRADEA Study," *Journal of Nutrition, Health & Aging* 21 (2017): 207–214.

12. J. O. Bock, "Associations of Frailty With Health Care Costs—Results of the ESTHER Cohort Study," *BMC Health Services Research* 16 (2016): 128.

13. J. F. Figueroa, "Concentration of Potentially Preventable Spending Among High-Cost Medicare Subpopulations: An Observational Study," *Annals of Internal Medicine* 167 (2017): 706–713.

14. P. Abizanda, "Function but Not Multimorbidity at the Cornerstone of Geriatric Medicine," *Journal of the American Geriatrics Society* 65 (2017): 2333–2334.

15. P. Abizanda, "Age, Frailty, Disability, Institutionalization, Multimorbidity or Comorbidity. Which Are the Main Targets in Older Adults?," *Journal of Nutrition, Health & Aging* 18 (2014): 622–627.

16. J. Apostolo, "Effectiveness of Interventions to Prevent Pre-Frailty and Frailty Progression in Older Adults: A Systematic Review," *JBI Database of Systematic Reviews and Implementation Reports* 16 (2018): 140–232.

17. F. J. Tarazona-Santabalbina, M. C. Gómez-Cabrera, P. Pérez-Ros, et al., "Multicomponent Exercise Intervention That Reverses Frailty and Improves Cognition, Emotion, and Social Networking in the Community-Dwelling Frail Elderly: A Randomized Clinical Trial,"

15325415, 2026, 3, Downloaded from https://agsjournals.onlinelibrary.wiley.com/doi/10.1111/jgs.70266 by Spanish Cochrane National Provision (Ministerio de Sanidad), Wiley Online Library on [13/09/2026]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

Journal of the American Medical Directors Association 17 (2016): 426–433.

18. P. Abizanda, M. D. López, V. P. García, et al., "Effects of an Oral Nutritional Supplementation Plus Physical Exercise Intervention on the Physical Function, Nutritional Status, and Quality of Life in Frail Institutionalized Older Adults: The ACTIVNES Study," *Journal of the American Medical Directors Association* 16 (2015): 439.e9–439.e16.

19. EIT-Health, FACET (EIT-Health, 2025), https://www.eithealth.eu/facet.

20. J. Barrio Cortes, T. Guevara Guevara, K. P. Aguirre Cocha, L. Rodríguez Mañas, and R. Pérez Rodríguez, "Positive Project: Maintenance and Improvement of Intrinsic Capacity Involving Primary Care and Caregivers Through a Home Monitoring System and a Telematic Services Platform," *Revista Española de Salud Pública* 95 (2021): e202110157.

21. D. L. Vetrano, K. Palmer, A. Marengoni, et al., "Frailty and Multimorbidity: A Systematic Review and Meta-Analysis," *Journals of Gerontology. Series A, Biological Sciences and Medical Sciences* 74 (2019): 659–666.

22. A. S. Kasa, P. Drury, V. Traynor, S. C. Lee, and H. R. Chang, "The Effectiveness of Nurse-Led Interventions to Manage Frailty in Community-Dwelling Older People: A Systematic Review," *Systematic Reviews* 12 (2023): 182.

23. R. Yu, G. Leung, and J. Woo, "Randomized Controlled Trial on the Effects of a Combined Intervention of Computerized Cognitive Training Preceded by Physical Exercise for Improving Frailty Status and Cognitive Function in Older Adults," *International Journal of Environmental Research and Public Health* 18 (2021): 1396.

24. E. Dent, C. Lien, W. S. Lim, et al., "The Asia-Pacific Clinical Practice Guidelines for the Management of Frailty," *Journal of the American Medical Directors Association* 18 (2017): 564–575.

25. British Geriatrics Society, *Fit for Frailty* (British Geriatrics Society, 2015), http://www.bgs.org.uk/campaigns/fff/fff_full.pdf.

26. Healthcare Improvement Scotland, *Think Frailty. Improving the Identification and Management of Frailty* (Healthcare Improvement Scotland, 2014), http://www.jitscotland.org.uk/wp-content/uploads/2014/11/Frailty-report.pdf.

27. British Columbia Ministry of Health, Frailty in Older Adults-Early Identification and Management (British Columbia Ministry of Health, 2017), https://www2.gov.bc.ca/assets/gov/health/practitioner-pro/bc-guidelines/frailty-full_guideline.pdf.

28. J. Travers, R. Romero-Ortuno, J. Langan, et al., "Building Resilience and Reversing Frailty: A Randomised Controlled Trial of a Primary Care Intervention for Older Adults," *Age and Ageing* 52 (2023): afad012.

29. M. Serra-Prat, X. Sist, R. Domenich, et al., "Effectiveness of an Intervention to Prevent Frailty in Pre-Frail Community-Dwelling Older People Consulting in Primary Care: A Randomised Controlled Trial," *Age and Ageing* 46 (2017): 401–407.

30. J. Fang, J. Ren, J. Wang, et al., "Combining Motivational and Exercise Intervention Components to Reverse Pre-Frailty and Promote Self-Efficacy Among Community-Dwelling Pre-Frail Older Adults: A Randomized Controlled Trial," *BMC Geriatrics* 24 (2024): 896.

31. R. Teh, D. Barnett, R. Edlin, et al., "Effectiveness of a Complex Intervention of Group-Based Nutrition and Physical Activity to Prevent Frailty in Pre-Frail Older Adults (SUPER): A Randomised Controlled Trial," *Lancet Healthy Longevity* 3 (2022): e519–e530.

32. R. Yu, C. Tong, and J. Woo, "Effect of an Integrated Care Model for Pre-Frail and Frail Older People Living in Community," *Age and Ageing* 49 (2020): 1048–1055.

33. A. Avendaño Céspedes, R. García Milina, R. Alcantud Córcoles, et al., "Ensayo Clínico Aleatorizado Multicéntrico Para Analizar la Eficacia de la Intervención de la Estrategia de Promoción de la Salud y Prevención en el Sistema Nacional de Salud de España de Cara a Reducir el Estado de Fragilidad en Adultos Mayores Prefrágiles o Frágiles (FRAILMERIT)," *Protocolo del estudioRevista Española de Salud Pública* 99 (2025): e202501001.

34. L. P. Fried, C. M. Tangen, J. Walston, et al., "Frailty in Older Adults: Evidence for a Phenotype," *Journals of Gerontology. Series A, Biological Sciences and Medical Sciences* 56 (2001): M146–M156.

35. F. I. Mahoney and D. W. Barthel, "Functional Evaluation: The Barthel Index," *Maryland State Medical Journal* 14 (1965): 61–65.

36. F. C. Bull, S. S. Al-Ansari, S. Biddle, et al., "World Health Organization 2020 Guidelines on Physical Activity and Sedentary Behaviour," *British Journal of Sports Medicine* 54 (2020): 1451–1462.

37. C. M. Tangen, J. Walston, A. B. Newman, et al., "Frailty in Older Adults: Evidence for a Phenotype," *Journals of Gerontology, Series A* 56 (2001): M146–M156.

38. I. Y. Jang, H. W. Jung, H. Y. Lee, H. Park, E. Lee, and D. H. Kim, "Evaluation of Clinically Meaningful Changes in Measures of Frailty," *Journals of Gerontology. Series A, Biological Sciences and Medical Sciences* 75 (2020): 1143–1147.

39. J. M. Guralnik, E. M. Simonsick, L. Ferrucci, et al., "A Short Physical Performance Battery Assessing Lower Extremity Function: Association With Self-Reported Disability and Prediction of Mortality and Nursing Home Admission," *Journal of Gerontology* 49 (1994): M85–M94.

40. S. Perera, S. H. Mody, R. C. Woodman, and S. A. Studenski, "Meaningful Change and Responsiveness in Common Physical Performance Measures in Older Adults," *Journal of the American Geriatrics Society* 54 (2006): 743–749.

41. D. Collado-Mateo, A. M. Lavín-Pérez, C. Peñacoba, et al., "Key Factors Associated With Adherence to Physical Exercise in Patients With Chronic Diseases and Older Adults: An Umbrella Review," *International Journal of Environmental Research and Public Health* 18 (2021): 2023.

42. J. Zhou, M. Yu, Y. Zheng, and X. Zhou, "Supervised Group-Based Exercise for Preventing Falls Among Older Adults in the Community: A Systematic Review and Meta-Analysis," *Journal of Nursing Care Quality* 39 (2024): E54–E60.

43. J. Woo, "Management of Frailty in the Community Setting," *Lancet Healthy Longevity* 3 (2022): e514–e515.

44. H. Viken, L. S. Reitlo, N. Zisko, et al., "Predictors of Dropout in Exercise Trials in Older Adults: The Generation 100 Study," *Medicine and Science in Sports and Exercise* 51 (2019): 49–55.

45. A. Stathi, C. J. Greaves, J. L. Thompson, et al., "Effect of a Physical Activity and Behaviour Maintenance Programme on Functional Mobility Decline in Older Adults: The REACT (Retirement in Action) Randomised Controlled Trial," *Lancet Public Health* 7 (2022): e316–e326.

46. S. P. Mullen, T. R. Wójcicki, E. L. Mailey, et al., "A Profile for Predicting Attrition From Exercise in Older Adults," *Prevention Science* 14 (2013): 489–496.

47. J. A. Schmidt, C. Gruman, M. B. King, and L. I. Wolfson, "Attrition in an Exercise Intervention: A Comparison of Early and Later Dropouts," *Journal of the American Geriatrics Society* 48 (2000): 952–960.

48. P. J. van der Laag, B. G. Dorhout, A. A. Heeren, C. Veenhof, D. J. A. Barten, and L. Schoonhoven, "Barriers and Facilitators for Implementation of a Combined Lifestyle Intervention in Community-Dwelling Older Adults: A Scoping Review," *Frontiers in Public Health* 11 (2023): 1253267.

49. J. Mareschal, L. Genton, T. H. Collet, and C. Graf, "Nutritional Intervention to Prevent the Functional Decline in Community-Dwelling Older Adults: A Systematic Review," *Nutrients* 12 (2020): 2820.

50. J. Taylor, S. Walsh, W. Kwok, et al., "A Scoping Review of Physical Activity Interventions for Older Adults," *International Journal of Behavioral Nutrition and Physical Activity* 18 (2021): 82.

15325415, 2026, 3, Downloaded from https://agsjournals.onlinelibrary.wiley.com/doi/10.1111/jgs.70266 by Spanish Cochrane National Provision (Ministerio de Sanidad), Wiley Online Library on [13/09/2026]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

51. E. K. Tarleton, A. K. Howe, J. Jewiss, and N. M. Gell, "Perceived Supports and Barriers to Optimal Nutrition and Physical Activity in a Cohort of Vermont Older Adults: A Convergent Parallel Mixed-Methods Study," *Journal of Applied Gerontology* (2025): 7334648251332009.

52. E. Salas-Groves, A. Childress, K. Albracht-Schulte, M. Alcorn, and S. Galyean, "Effectiveness of Home-Based Exercise and Nutrition Programs for Senior Adults on Muscle Outcomes: A Scoping Review," *Clinical Interventions in Aging* 18 (2023): 1067–1091.

53. S. Hwang and E. S. Yi, "'HOPE-FIT' in Action: A Hybrid Effectiveness-Implementation Protocol for Thriving Wellness in Aging Communities," *Journal of Clinical Medicine* 14 (2025): 6679.

54. P. J. van der Laag, B. G. Dorhout, A. A. Heeren, C. Veenhof, D. J. A. Barten, and L. Schoonhoven, "Identification and Development of Implementation Strategies: The Important Role of Codesign," *Frontiers in Health Services* 4 (2024): 1305955.

Supporting Information

Additional supporting information can be found online in the Supporting Information section. **Table S1:** Main results for the sample completing visits 1 and 2. Intention to treat and per protocol analysis. Comparisons are done between intervention group and control between visits. **Table S2:** Outcomes for the sample completing visits 1 and 4. Intention to treat and per protocol analysis. Comparisons are made between intervention group and control between visits 1 and 4. **Figures S1** and **S2:** Physical exercise program. **Figures S3** and **S4:** Nutritional intervention. **Figure S5:** Frailty training main recommendations.

Appendix A

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