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Original Research

Changes in physical performance and frailty-associated risk associated with participation in a community exercise programme: Findings from the ExWell cohort

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ABSTRACT

Introduction: Exercise can improve physical function and reduce disability in older adults living with frailty. ExWell Medical is a national, community-based, medically supported group exercise program for people living with chronic conditions in Ireland.

Study aims/objectives: We aimed to evaluate the longitudinal association between baseline frailty status and outcomes including gait speed in ExWell programme participants.

Methods: This is a secondary data analysis of a prospective cohort study. All participants attending an ExWell Medical induction in the Dublin/Kildare regions January-September 2023 were invited to participate. At baseline, 12, and 24 weeks we collected data on socio-demographics; health behaviours; measures of physical function; patient-reported outcomes. The cohort were stratified by Clinical Frailty Scale category at baseline.

Results: We recruited 1290 participants (mean age 69 (SD:10.9) years; 60% female. At baseline 15% of participants were classified as frail, 23% prefrail, 62% robust. Baseline frailty was associated with a higher chronic condition count, higher health service use, poorer scores on measures of physical function, EQVAS, EQ5D5L index scores. There was an inverse association between frailty and class attendance ($p < 0.001$). Attrition increased with increasing baseline frailty status ($p = 0.006$). Participants who were frail at baseline had improvements between baseline and 24-week reassessment in gait speed, timed up and go, six-minute time trial, EQVAS; prefrail participants in the sit to stand test, six-minute time trial, EQVAS, but no improvement in timed up and go. Robust participants recorded improvements in all measures.

Conclusion: Participation in the ExWell programme was associated with improvements across frailty groups in community-dwelling adults living with chronic conditions.

1. Introduction

Frailty is a complex multidimensional geriatric syndrome characterised by a state of increased susceptibility to stressors. It is associated with an increased risk of adverse outcomes including falls, disability, hospitalisation, and mortality [1,2]. In Ireland, 12.7% of community-dwelling adults aged ≥ 50 years, and 21.5% aged ≥ 65 years are estimated to be living with frailty [3], which is comparable to international estimates [4]. Ireland, similar to most developed countries, has an ageing population, and the number of adults aged greater than 65 years is predicted to exceed one million by 2030 [5].

Exercise interventions have been shown to prevent and reverse frailty and pre-frailty among older adults [6–10]. Evidence suggests this only applies to interventions conducted within group settings, with mixed reports for single, condition-specific management programs [8]. Multicomponent exercise programs have been found to be more effective than resistance training alone [6], and are recommended in national and international guidance on physical activity for older adults [11,12].

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Evidence suggests adherence to structured community-based exercise programmes is high [7,13].

There are numerous operational definitions for the classification of frailty [14], which are predominantly based on two principal models. The phenotypic model focuses on the identification of several physical traits such as weight loss, low energy and reduced physical activity [15]. In contrast, the cumulative deficit model focuses on the accumulation of multiple health deficits including chronic diseases [16,17]. Although the Fried frailty phenotype and the Frailty Index are among the most commonly used operational definitions, they are relatively time and data intensive and therefore somewhat difficult to implement at scale in the community setting. The Clinical Frailty Scale is a judgement-based frailty assessment tool that is easy to use, administered by trained clinicians, and has comparable predictive validity to the Fried frailty phenotype and Frailty Index [18]. Gait speed has also been proposed as a pragmatic proxy indicator of frailty in clinical and research settings [19–23] Gait speed less than 0.8m/s has been proposed as a simple proxy indicator of frailty in primary care setting [24,25]. In real-world clinical and service datasets, longitudinal measurement of frailty using comprehensive instruments is often not feasible, so objective physical performance measures, particularly gait speed, are frequently used as pragmatic markers of frailty risk and predictors of adverse outcomes.

Frailty is a dynamic condition commonly involving transitions between frailty states; with transition to increasing frailty more common than transition to decreasing frailty [2,26]. Transitions between frailty states in older adults are common but rates of transition from frail to non-frail states are low. Lower frailty prevalence in the younger older adult population presents opportunities for early identification and interventions to halt or reverse frailty progression [27].

The aim of this study was to examine the longitudinal association between baseline frailty status and health related outcomes for adults living with chronic conditions and multimorbidity attending an established community-based exercise rehabilitation programme.

2. Methods

2.1. Study design

This was a secondary analysis of data from a prospective cohort study of a community-based exercise rehabilitation programme (CBER) program. The main quantitative outcomes are reported in a separate publication [28] and qualitative analysis is in progress. The CBER programme (ExWell Medical) was funded by the Health Service Executive (HSE) in the Dublin and Kildare regions (Community Healthcare Organisation (CHO) 7). Ethical approval was obtained from Trinity College Dublin's Research Ethics Committee (reference number 221002). We reported our findings in accordance with the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) checklist (Supplementary Data Appendix A) [29].

2.2. ExWell programme

ExWell Medical [30] is a medically designed CBER program for people living with chronic conditions in Ireland, referred by their healthcare practitioners. It involves twice weekly supervised group exercise classes conducted in community fitness centres. Classes involve a warm-up, aerobic, resistance, core stability and balance exercises, and a cool down. The standard class structure is based on stations and accommodates participants with various chronic conditions and different levels of functional ability (Supplementary Data Appendix D).

2.3. Setting and sampling

Potential participants referred to an ExWell class within the study area by a healthcare professional in primary or specialty care were contacted by an administrator, and invited to attend an induction session delivered by a medical doctor. All patients who were referred to ExWell and attended an induction in the study area between 30 January and 22 September 2023 were invited to participate. Potential participants were provided with a link to a participant information leaflet prior to attending their scheduled induction session. Participation in the study was voluntary and those declining to join the research project continued to participate in the ExWell program. All participants provided written informed consent.

2.4. Population

Eligible participants were aged $\geq$ 18 years, living with at least one diagnosed chronic condition, and referred to ExWell by a healthcare professional. We excluded those unable to participate in the program due to disabling physical conditions (e.g., uncontrolled cardiac conditions) or with mental health conditions, cognitive impairments, or language difficulties that restricted communication or capacity to consent.

2.5. Data collection

Data for the main cohort study were collected at baseline (induction session), 12-, and 24 weeks (reassessment sessions) by trained members of the ExWell team. This paper focuses on baseline and 24-week outcome assessments. Blinding of outcome assessors was not possible. Participants were invited to complete assessments regardless of how many classes they had attended. Study participants no longer attending the ExWell program were invited by phone call from the study team to return for a specific follow-up session at 24 weeks post-induction to complete the patient questionnaire and physical outcome measures. For those unable to attend, telephone interviews were conducted to complete patient reported outcome measures (PROMs), and capture reasons for non-attendance, where possible. Participant recruitment, retention, and individual participant class attendance were also recorded.

2.6. Outcome measures

For this secondary analysis, we identified in advance which outcomes we would consider based on their hypothesised association with frailty. We collected data regarding demographics, health, health behaviour (Supplementary Data Appendix E), measures of physical function (Supplementary Data Appendix B), and patient reported outcome measures (Box 1). Frailty status at baseline was assessed using the Clinical Frailty Scale (CFS), a validated multidimensional measure of frailty incorporating clinical judgement across functional and cognitive domains [18]. At follow-up, a repeat multidimensional frailty assessment was not available. Therefore, gait speed was used as an objective outcome measure of physical performance and as a proxy indicator of frailty-associated risk. Gait speed is a well-established predictor of adverse outcomes and forms a core component of frailty phenotypes.

2.7. Data analysis

Descriptive statistics were used to summarise the baseline demographic details of enrolled participants. Demographic details and selected measures of physical function and patient reported outcome measures (PROMs) were categorized by frailty status determined by the Clinical Frailty Scale at baseline. Due to small numbers in some of the Clinical Frailty Scale categories, the categories were grouped into three groups to assist with analysis, presentation, and interpretation of results. The 'Very Fit', 'Well' and 'Managing Well' groups were grouped under 'Robust'. The 'Prefrail' group remained unchanged. 'Mildly Frail', 'Moderately Frail', 'Severely Frail', and 'Terminally Ill' groups were combined to form the 'Frail' group'.

Change in mean scores from baseline to 24-week reassessment for select outcome measures were analysed by Clinical Frailty Scale

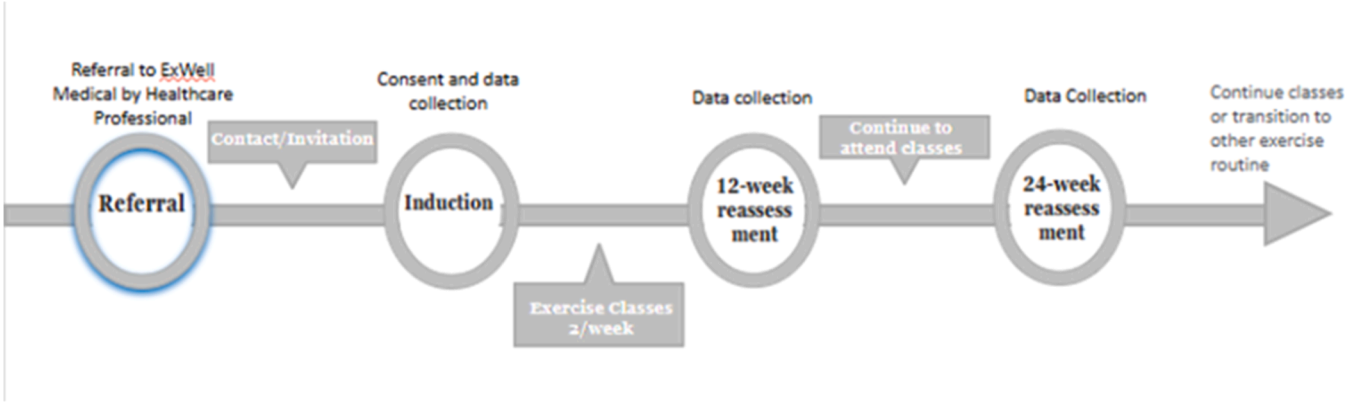


Fig. 1. Intended flow of study participants.

category. Differences between frailty groups were assessed using ANOVA, Kruskal Wallis, or chi square tests. The primary analysis of the impact of the program at the pre-defined study endpoint (24 weeks) was conducted as a complete case analysis and included the participants with data available at both time points

Descriptive statistics were utilised to assess frailty risk pre and post intervention using gait speed as a proxy indicator of frailty-associated risk. Participants were stratified into groupings of frail, prefrail, and robust based on gait speed results (<0.8m/s frail, 0.8–1.2 m/s prefrail, >1.2m/s robust) [19,31,25].

Programme attrition by frailty status group was assessed using Pearson chi square test.

Multivariable logistic regression was used to assess whether frailty status predicted program dropout. Linear regression was used to assess the impact of class attendance on gait speed at 24 weeks. All statistical analyses were performed in STATA [32].

3. Results

Between January 30th and September 22nd 2023, 1290 participants were enrolled (mean age 69 (SD:10.90) years; 60% female). The mean number of healthcare services attended was 1.6 (SD:1.44) and mean number of chronic conditions was 3.3 (SD:2.17).

The Clinical Frailty Scale was conducted for all participants at induction to the ExWell program. Table 1 presents baseline data for study participants by Clinical Frailty Scale status.

At baseline, increased frailty was associated with increased age; higher chronic condition count ($X^2(3)$-23.036 < 0.001); poorer scores on each of gait speed (m/s), timed up and go (*sec*), five sit-to-stand, six-minute walk test (m), EQVAS, and EQ5D5L index scores; and with higher health service use as estimated by number of services attended.

Longitudinal data at 24 weeks was available for 725 participants. Change in mean scores for gait speed (m/s), timed up and go (*sec*), sit to stand (*sec*), six-minute walk test (m), EQVAS, and EQ5D5L index scores from induction to 24-week reassessment were analysed by Clinical Frailty Scale group and are presented in Table 2.

For participants who were frail at baseline, there were statistically significant improvements in gait speed (m/s), time up and go (*sec*), six-minute time trial (m), and EQVAS. There were also improvements in the sit to stand test (*sec*) and EQ5D5L index score although not reaching statistical significance.

Prefrail participants had improvements in the sit to stand test (*sec*), six-minute time trial (m), and EQVAS. There were improvements in gait speed (m/s) and EQ5D5L index score, but these did not reach statistical significance. There was no improvement in timed up and go (*sec*).

The robust participants at baseline recorded improvements in all of gait speed (m/s), timed up and go (*sec*), sit to stand test (*sec*), six-minute walk test (m), EQVAS, and EQ5D5L index score.

Differences in the improvements observed differed significantly between the frailty groups for each outcome assessed other than the six-minute walk test. The frail group showed more improvement than the robust group in four of the five with significant differences and equal improvement in the other. (Supplementary Data Appendix F Table 1).

Box 1
Participant characteristic and study outcome measures

- Age, sex, marital status
- Health behaviours (smoking and alcohol use)
- Number of chronic conditions
- Number of healthcare services attended
- Clinical Frailty Status
- Physical measures:
  - Six-minute walk test (m)
  - Gait speed test(m/s)
  - Timed up and go (m/s)
  - Five sit to stand test (*sec*)
- Patient reported outcome measures
  - Health related quality of life using the EQVAS and EQ5D5L index score [28,29]

3.1. Change in gait speed frailty risk groups

Using gait speed as a proxy for frailty risk, 28% of participants improved their frailty risk group, 55% remained unchanged, and 17% disimproved ($\chi^2(2) = 27.75$, $p < 0.001$) (Supplementary Data Appendix F Table 5).

3.2. Attrition by frailty status

Programme dropout was explored by Clinical Frailty Scale group (Supplementary Data Appendix F Table 2).

The percentage of participants that dropped out of the program by 24 weeks increased with increasing frailty status ($p < 0.002$).

3.3. Regression analyses

Multivariable logistic regression (Supplementary Data Appendix F Table 3) was used to assess whether frailty status predicted program dropout, the model adjusted for age, comorbid condition count, and gender. Frail participants had significantly higher odds of program dropout than robust participants (OR 1.93 CI 1.35–2.78 $p < 0.001$).

Linear regression analysis (Supplementary Data Appendix F Table 4) showed that higher class attendance counts were associated with

Table 1
Participant demographics, outcomes measures, and class attendance by Clinical Frailty Scale categories.

		Robust (n, SD/%)	Prefrail (n, SD/%)	Frail (n, SD/%)	p-value
		n = 668	n = 250	n = 166	
Age		69 (10.6)	71 (9.9)	72 (11.9)	p < 0.001
Gender	female	390 (58%)	161 (64%)	96 (58%)	p = 0.22
	male	278 (42%)	89 (36%)	70 (42%)	
Marital Status	unmarried	254 (38%)	99 (40%)	66 (40%)	p = 0.91
	married	400 (60%)	143 (57%)	96 (58%	
	unknown	14 (2%)	7 (3%)	3 (2%)	
		Robust (mean, SD)	**Prefrail (mean, SD)**	**Frail (mean, SD)**	**p value**
No of chronic diseases	3.12 (1.96)		3.74 (2.19)	3.96 (2.69)	p < 0.001
Number of health care services attended	1.34 (1.12)		1.72 (1.47)	2.51 (2.04)	p < 0.001
Number of classes attended	17.59 (12.48)		15.95 (12.13)	12.93 (11.57)	p < 0.001
Gait speed (m/s)	1.24(0.25)		1.06 (0.27)	0.85 (0.30)	p < 0.001
Timed up and go (*sec*)	8.02 (3.68)		10.10 (4.45)	16.10 (11.00)	p < 0.001
Sit to stand (*sec*)	10.27 (3.78)		11.49 (3.88)	15.40 (9.34)	p < 0.001
Six-minute time trial (*sec*)	466.09 (110.18)		379.24 (118.12)	291.28 (134.48)	p < 0.001
EQVAS	72.95(17.27)		63.53 (17.42)	55.40 (18.72)	p < 0.001
EQ5D5L index score	0.75 (0.26)		0.62 (0.26)	0.45 (0.34)	p < 0.001

At baseline, 62% of participants were robust, 23% prefrail, and 15% frail.

improved gait speed values at 24 weeks (β = 0.006 per class attended, CI 0.003–0.009, p = 0.001), after adjusting for baseline gait speed, frailty status, age, gender, and number of conditions.

4. Discussion

This secondary analysis of a prospective cohort study found a clinically meaningful positive association between participation in the ExWell programme with multiple physical outcome measures and quality of life in frail, prefrail, and robust community dwelling adults with chronic disease and multimorbidity, and with similar or greater gains among those who were frail compared to those who were robust at baseline. A significant body of evidence supports exercise therapy as an effective intervention for individuals living with prefrailty and frailty [6,7]. This study adds to this existing literature by providing real world evidence from a preexisting community based exercise rehabilitation programme It takes into account the complexities of delivering such a programme at scale in the community

There was significant representation of the frail and prefrail population in the study sample with 38% of participants classified as prefrail or frail. At baseline, increasing frailty (assessed using the Clinical Frailty Scale) was associated with a higher chronic condition count, with poorer scores on each of gait speed (m/s), timed up and go (*sec*), five sit-to-stand, six-minute walk test (m), EQVAS, and EQ5D5L index scores at baseline, and with higher health service use as estimated by number of healthcare services attended.

Frailty prevalence in the current study cohort was 15% and prefrailty was 23%, comparable with prevalence rates in the national longitudinal

Table 2
Change in mean score for outcome measures from baseline to 24-week reassessment by Clinical Frailty Status group.

Outcome Measure	Clinical Frailty Scale Group	Induction	24 Week Reassessment	p value	n
GST (m/s)		*Value Mean (SD)*			
	Robust	1.24 (.242)	1.32 (.363)	<0.001	379
	Prefrail	1.05 (.267)	1.11 (.454)	0.135	124
	Frail	.89 (.037)	.97 (.044)	0.005	62
TUG (sec)		*Value Mean (SD)*			
	Robust	8.00(4.52)	7.51(3.50)	0.04	389
	Prefrail	10.03 (4.56)	10.32(7.78)	0.53	126
	Frail	15.52 (9.36)	13.52(10.08)	0.03	68
Sit to Stand (*sec*)		*Value Mean (SD)*			
	Robust	10.13 (3.45)	8.90(3.80)	<0.001	380
	Prefrail	11.32 (3.69)	9.81(2.87)	<0.001	122
	Frail	15.59 (7.20)	14.21(7.38)	0.11	68
Six-minute time trial (m)		*Value Mean (SD)*			
	Robust	470.81 (98.25)	521.16(128.34)	<0.001	386
	Prefrail	376.12 (114.13)	400.55(131.27)	0.002	123
	Frail	295.72 (123.65)	334.37(149.21)	0.002	68
EQVAS		*Value Mean (SD)*			
	Robust	75.44 (16.58)	78.00(14.45)	0.004	376
	Prefrail	64.17 (16.8)	67.76(15.92)	0.036	121
	Frail	56.47 (18.95)	63.90(18.99)	0.004	71
EQ5D5L Index Score		*Value Mean (SD)*			
	Robust	.772(.219)	.794(.196)	0.01	351
	Prefrail	.626(.253)	.659(.245)	0.136	110
	Frail	.536(.286)	.561(.304)	0.46	65

study of ageing (TILDA) of 11% with frailty and 44.5% with prefrailty [3], though TILDA participants are younger and may or may not suffer from chronic disease.

There is existing evidence that CBER programmes are effective in preventing and reversing prefrailty and frailty in older adults in trial settings [6–10]. The current study provides real-world data from an existing service that supports this evidence, demonstrating a significant longitudinal association with clinically meaningful improvements in frailty related outcomes, including objective physical tests and health related quality of life.

Lim et al. concluded that CBER programs are effective in both improving gait speed and reversing pre-frailty [10]. The clinically significant improvement in gait speed of 0.08m/s in the current study cohort is consistent with previous studies [24,33,34] and was similar across all three frailty status groups (range: 0.06m/s-0.08m/s). A change in gait speed of 0.05m/s is associated with small meaningful clinical benefits and substantial benefits at 0.1m/s [24].

Significant improvements were also recorded in the timed up and go (TUG) test in both the robust and frail groups, but not in the prefrail group. TUG has been identified as a measure that can be utilised in frailty assessment, but not in assessing prefrailty [35]. The reduction of 2 s in the frail group is almost at the level of 2.1 s change that has been identified as a clinically meaningful change in functional status [36],

and it brings the mean result for this group below 15 s, proposed as a cut off value for assessing falls risk [37]. The current study recorded a reduction of 1.4 s in the five time sit to stand test for frail participants post intervention; this reaches the threshold for minimum clinically important difference in older adults [38]. A 17.8 m [39] and 20 m [24] improvement in six minute walk test has been proposed as a clinically important change in this test in older adults; all three groups in the current study surpass both values.

We identified a significant improvement in health-related quality of life measured using the EQVAS for the robust (+3), prefrail (+4), and frail (+6) groups. This was below the MCID of 9 [40]; however, previous studies found no improvement in health-related quality of life in frail and prefrail older adults post exercise therapy so any improvement is encouraging [7,10]. Apostalo et al. found that quality of life only improved with interventions that also included individually tailored care plans and psychological therapy [8].

Similar to Lim et al. we also found that increasing class attendance was associated with greater improvements in gait speed. After adjusting for baseline gait speed and other covariates, we found no evidence that the relationship between class attendance and gait speed differed by frailty group. These findings across studies may suggest that the frequency of exercise sessions may influence the effect size for gait speed [10] and highlights the importance of adherence to the exercise program. We identified that increasing frailty severity was associated with a higher rate of program dropout and lower class attendance. This may be an important area to focus on engaging and retaining more frail participants. Previous studies have reported that adherence to community exercise programs aimed at frail and older adults was high but this may vary with severity as found in our study [6,9,13]. A previous systematic review of the evidence for primary care interventions to delay and reverse frailty reported that a key differentiator in addressing participation in physical activity programs was ongoing encouragement from medical professionals [9].

Overall, a significant change in gait speed derived frailty risk status was observed between induction and 24-week reassessment. More participants improved than deteriorated, although some declines were also observed. This suggests a general shift towards improved frailty risk status following the intervention. A systematic review and meta-analysis of community exercise interventions in prefrail older adults concluded that individuals participating in community exercise had three times greater odds of reversing prefrailty to robust state [10]. Given that frailty prevalence increases [3] and severity progresses [26,27] with age, a net improvement of 11% of participants is encouraging.

5. Strengths and limitations

This study reports a secondary data analysis exploring frailty in a prospective cohort study evaluating a preexisting intervention running in community centres across Ireland, so its findings reflect real world implementation and the real-world logistical challenges involved in delivery of CBER programs. It was conducted and reported in line with the STROBE reporting guidelines [29].

The study design is a limitation as it can't determine effectiveness, but randomisation of participants was not possible in this real-world setting. A further limitation relates to the lack of blinding of outcome assessors, which was not possible in this setting and within our study budget. However physical performance measures were relatively objective, minimising observer bias.

The substantial loss to follow up (44% of participants) increases the risk of attrition bias and may limit the generalizability of the results. However, measures were taken to contact those who were lost to follow up to explore reasons for disengagement and to invite them to attend for reassessment. Additional analyses exploring the impact of attrition were also reported in the main cohort paper indicating that observed improvements in the measures reported there are unlikely to be driven by attrition bias [28]

The use of the Clinical Frailty Scale to record baseline frailty status could be seen as a limitation. The Fried Frailty Criteria or the Frailty Index could have been utilised; however, the Clinical Frailty Scale was chosen as it is easy to administer in large numbers and has been shown to have comparative validity with the Frailty Index [41].

The lack of a multidimensional frailty measure at 24-week reassessment is a limitation but it was not possible to repeat the measure due to resource constraints. However, the use of gait speed as an objective proxy measure provided data on pre and post intervention frailty risk.

6. Conclusion

This study provided evidence that participation in the ExWell programme was associated with significant improvements in frailty risk across groups in community-dwelling adults living with one or more chronic conditions, outside the context of controlled trial settings. Programme completion by participants living with frailty was associated with improvements in physical performance and quality of life that mostly matched or exceeded those estimated for more robust participants, but attrition from the programme was also greater in participants living with frailty. Effective strategies to improve adherence and reduce attrition among adults living with pre-frailty and frailty in community-based exercise programmes warrant further investigation.

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Declaration of generative AI and AI-assisted technologies in the writing process

AI and AI assisted technologies have not been used in the writing of this paper

Data availability

The datasets generated and analysed as part of this research study are not currently publicly available.

CRediT authorship contribution statement

Muireann O'Shea: Writing – review & editing, Writing – original draft, Visualization, Resources, Project administration, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Paul Doody:** Writing – review & editing, Writing – original draft. **Noel McCaffrey:** Project administration, Methodology, Investigation, Funding acquisition, Conceptualization. **Aodhaghan O'Deasmhunaigh:** Project administration, Methodology, Investigation, Data curation, Conceptualization. **Fiona Skelly:** Methodology, Investigation, Conceptualization. **Lisa Kelly:** Writing – review & editing, Writing – original draft, Project administration. **Sean P Kennelly:** Writing – review & editing, Writing – original draft, Methodology, Conceptualization. **Susan M Smith:** Writing – review & editing, Writing – original draft, Visualization, Supervision, Project administration, Methodology, Funding acquisition, Formal analysis, Conceptualization. **Noel McCarthy:** Writing – review & editing, Writing – original draft, Visualization, Supervision, Project administration, Methodology, Formal analysis,

Conceptualization.

Declaration of competing interest

The authors declare the following financial interests/personal relationships which may be considered as potential competing interests: Muireann O Shea reports financial support was provided by Health Service Executive. If there are other authors, they declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.tjfa.2026.100199.

References

[1] Rodríguez-Mañas L, Féart C, Mann G, Viña J, Chatterji S, Chodzko-Zajko W, et al. Searching for an operational definition of frailty: a Delphi method based consensus statement. The frailty operative definition-consensus conference project. J Gerontol A 2013;68(1):62–7. https://doi.org/10.1093/gerona/gls119.

[2] Frailty in Older People. Lancet 2013;381(9868):752–62. https://doi.org/10.1016/S0140-6736(12)62167-9. PubMed PMID: 23395245; PubMed Central PMCID: PMC4098658.

[3] O'Halloran Aisling, McGarrigle Christine, Scarlett Siobhan, Roe Lorna, Romero-Ortuno Roman, Kenny Rose Anne. TILDA report on population estimates of physical frailty in Ireland to inform demographics for over 50s in Ireland during the COVID19 pandemic [Internet]. TILDA 2020. Available from, https://tilda.tcd.ie/publications/reports/Covid19Frailty/index.php.

[4] Collard RM, Boter H, Schoevers RA, Oude Voshaar RC. Prevalence of frailty in community-dwelling older persons: a systematic review. J Am Geriatr Soc 2012;60(8):1487–92. https://doi.org/10.1111/j.1532-5415.2012.04054. x PubMed PMID: 22881367.

[5] Central Statistics Office. Population and labour force projections 2023-2057 [Internet] [cited 2026 Dec 2]. Available from, https://www.cso.ie/en/releasesandpublications/ep/p-plfp/populationandlabourforceprojections2023-2057/#:~:text=The%20projections%20assume%20that%20fertility%20and%20mortality,expected%20to%20increase%20under%20all%20three%20scenarios; 2024.

[6] Theou O, Stathokostas L, Roland KP, Jakobi JM, Patterson C, Vandervoort AA, et al. The effectiveness of exercise interventions for the management of frailty: a systematic review. J Aging Res 2011;2011:569194. https://doi.org/10.4061/2011/569194. PubMed PMID: 21584244; PubMed Central PMCID: PMC3092602.

[7] de Vries NM, van Ravensberg CD, Hobbelen JSM, Olde Rikkert MGM, Staal JB, Nijhuis-van der Sanden MWG. Effects of physical exercise therapy on mobility, physical functioning, physical activity and quality of life in community-dwelling older adults with impaired mobility, physical disability and/or multi-morbidity: a meta-analysis. Ageing Res Rev 2012;11(1):136–49. https://doi.org/10.1016/j.arr.2011.11.002. PubMed PMID: 22101330.

[8] Apóstolo J, Cooke R, Bobrowicz-Campos E, Santana S, Marcucci M, Cano A, et al. Effectiveness of interventions to prevent pre-frailty and frailty progression in older adults: a systematic review. JBI Database Syst Rev Implement Rep 2018;16(1):140–232. https://doi.org/10.11124/JBISRIR-2017-003382. PubMed PMID: 29324562; PubMed Central PMCID: PMC5771690.

[9] Travers J, Romero-Ortuno R, Bailey J, Cooney MT. Delaying and reversing frailty: a systematic review of primary care interventions. Br J Gen Pr 2019;69(678):e61–9. https://doi.org/10.3399/bjgp18X700241. PubMed PMID: 30510094.

[10] Lim H, Jani NDB, Pang WT, Lim ECW. Community-based exercises improve health status in pre-frail older adults: a systematic review with meta-analysis. BMC Geriatr 2024;24(1):589. https://doi.org/10.1186/s12877-024-05150-7.

[11] WHO. Guidelines on physical activity and sedentary behaviour. Geneva: World Health Organisation; 2020.

[12] Health Service Executive. Every move CountsNational physical activity and sedentary behavior guidelines for Ireland. Dublin, Ireland; 2024.

[13] Farrance C, Tsofliou F, Clark C. Adherence to community based group exercise interventions for older people: a mixed-methods systematic review. Prev Med 2016;87:155–66. https://doi.org/10.1016/j.ypmed.2016.02.037.

[14] Ma L. Current situation of frailty screening tools for older adults. J Nutr Health Aging 2019;23(1):111–8. https://doi.org/10.1007/s12603-018-1123-4. PubMed PMID: 30569079; PubMed Central PMCID: PMC12280508.

[15] Fried LP, Tangen CM, Walston J, Newman AB, Hirsch C, Gottdiener J, et al. Frailty in older adults: evidence for a phenotype. J Gerontol A 2001;56(3):M146–57. https://doi.org/10.1093/gerona/56.3.M146.

[16] Rockwood K, Mitnitski A. Frailty in relation to the accumulation of deficits. J Gerontol A 2007;62(7):722–7. https://doi.org/10.1093/gerona/62.7.722.

[17] Theou O, Haviva C, Wallace L, Searle SD, Rockwood K. How to construct a frailty index from an existing dataset in 10 steps. Age Ageing 2023;52(12):afad221. https://doi.org/10.1093/ageing/afad221.

[18] Rockwood K, Song X, MacKnight C, Bergman H, Hogan DB, McDowell I, et al. A global clinical measure of fitness and frailty in elderly people. CMAJ Can Med Assoc J J Assoc Med Can 2005;173(5):489–95. https://doi.org/10.1503/cmaj.050051. PubMed PMID: 16129869; PubMed Central PMCID: PMC1188185.

[19] Cesari M, Kritchevsky SB, Penninx BWHJ, Nicklas BJ, Simonsick EM, Newman AB, et al. Prognostic value of usual gait speed in well-functioning older people—results from the health, aging and body composition study. J Am Geriatr Soc 2005;53(10):1675–80. https://doi.org/10.1111/j.1532-5415.2005.53501.x.

[20] Cesari M, Kritchevsky SB, Newman AB, Simonsick EM, Harris TB, Penninx BW, et al. Added value of physical performance measures in predicting adverse health-related events: results from the health, aging and body composition study. J Am Geriatr Soc 2009;57(2):251–9. https://doi.org/10.1111/j.1532-5415.2008.02126.x.

[21] Abellan Van Kan G, Rolland Y, Andrieu S, Bauer J, Beauchet O, Bonnefoy M, et al. Gait speed at usual pace as a predictor of adverse outcomes in community-dwelling older people an international academy on nutrition and aging (IANA) Task Force. J Nutr Health Aging 2009;13(10):881–9. https://doi.org/10.1007/s12603-009-0246-z.

[22] Kawai H, Obuchi S, Watanabe Y, Hirano H, Fujiwara Y, Ihara K, et al. Association between daily living walking speed and walking speed in laboratory settings in healthy older adults. Int J Env Res Public Health 2020;17(8):2707. https://doi.org/10.3390/ijerph17082707.

[23] Doody P, Lord JM, Greig CA, Whittaker AC. Frailty: pathophysiology, theoretical and operational definition(s), impact, prevalence, management and prevention, in an increasingly economically developed and ageing world. Gerontology 2023;69(8):927–45. https://doi.org/10.1159/000528561.

[24] Perera S, Mody SH, Woodman RC, Studenski SA. Meaningful change and responsiveness in common physical performance measures in older adults. J Am Geriatr Soc 2006;54(5):743–9. https://doi.org/10.1111/j.1532-5415.2006.00701.x. PubMed PMID: 16696738.

[25] Castell MV, Sánchez M, Julián R, Queipo R, Martín S, Otero Á. Frailty prevalence and slow walking speed in persons age 65 and older: implications for primary care. BMC Fam Pr 2013;14:86. https://doi.org/10.1186/1471-2296-14-86. PubMed PMID: 23782891.

[26] Gill TM, Gahbauer EA, Allore HG, Han L. Transitions between frailty states among community-living older persons. Arch Intern Med 2006;166(4):418. https://doi.org/10.1001/archinte.166.4.418.

[27] Walsh B, Fogg C, Harris S, Roderick P, de Lusignan S, England T, et al. Frailty transitions and prevalence in an ageing population: longitudinal analysis of primary care data from an open cohort of adults aged 50 and over in England, 2006–2017. Age Ageing 2023;52(5):afad058. https://doi.org/10.1093/ageing/afad058. PubMed PMID: 37140052; PubMed Central PMCID: PMC10158172.

[28] O'Shea M, Doody P, McCaffrey N, O'Deashunaigh A, Skelly F, Kelly L, et al. Community-based, supervised, group exercise for people living with chronic conditions and multimorbidity: a cohort study. Age Ageing 2026;55(6):afag174. https://doi.org/10.1093/ageing/afag174.

[29] von Elm E, DG Altman, Egger M, Pocock SJ, Gøtzsche PC, Vandenbroucke JP. The strengthening the reporting of observational studies in epidemiology (STROBE) statement: guidelines for reporting observational studies. Lancet 2007;370(9596):1453–7. https://doi.org/10.1016/S0140-6736(07)61602-X. PubMed PMID: 18064739.

[30] ExWell [Internet]. ExWell medical; [cited 2024 Aug 28]. ExWell Medical. Available from: https://www.exwell.ie/.

[31] Studenski S, Perera S, Patel K, Rosano C, Faulkner K, Inzitari M, et al. Gait speed and survival in older adults. JAMA J Am Med Assoc 2011;305(1):50. https://doi.org/10.1001/jama.2010.1923. PubMed PMID: 21205966; PubMed Central PMCID: PMC3080184.

[32] StataCorp. Stata statistical software: release 18. College Station, TX: StataCorp LLC; 2023.

[33] Perera S, Patel KV, Rosano C, Rubin SM, Satterfield S, Harris T, et al. Gait speed predicts incident disability: a pooled analysis. J Gerontol Biol Sci Med Sci 2016;71(1):63–71. https://doi.org/10.1093/gerona/glv126. PubMed PMID: 26297942; PubMed Central PMCID: PMC4715231.

[34] Mehdipour A, Malouka S, Beauchamp M, Richardson J, Kuspinar A. Measurement properties of the usual and fast gait speed tests in community-dwelling older adults: a COSMIN-based systematic review. Age Ageing 2024;53(3):afae055. https://doi.org/10.1093/ageing/afae055.

[35] Savva GM, Donoghue OA, Horgan F, O'Regan C, Cronin H, Kenny RA. Using timed up-and-go to identify frail members of the older population. J Gerontol A 2013;68(4):441–6. https://doi.org/10.1093/gerona/gls190.

[36] Maldaner N, Sosnova M, Ziga M, Zeitlberger AM, Bozinov O, Gautschi OP, et al. External validation of the minimum clinically important difference in the timed-up-and-go test after surgery for lumbar degenerative disc disease. Spine 2022;47(4):337–42. https://doi.org/10.1097/BRS.0000000000004128. PubMed PMID: 34033596.

[37] Montero-Odasso M, van der Velde N, Martin FC, Petrovic M, Tan MP, Ryg J, et al. World guidelines for falls prevention and management for older adults: a global

initiative. Age Ageing 2022;51(9):afac205. https://doi.org/10.1093/ageing/afac205. PubMed PMID: 36178003; PubMed Central PMCID: PMC9523684.
[38] Gonzalez-Bautista E, de Souto, Barreto P, Salinas-Rodriguez A, Manrique-Espinoza B, Rolland Y, Andrieu S, et al. Clinically meaningful change for the chair stand test: monitoring mobility in integrated care for older people. J Cachexia Sarcopenia Muscle 2022;13(5):2331–9. https://doi.org/10.1002/jcsm.13042. PubMed PMID: 36017772; PubMed Central PMCID: PMC9530589.
[39] Kwok BC, Pua YH, Mamun K, Wong WP. The minimal clinically important difference of six-minute walk in Asian older adults. BMC Geriatr 2013;13:23. https://doi.org/10.1186/1471-2318-13-23. PubMed PMID: 23510291; PubMed Central PMCID: PMC3599457.
[40] Cheng LJ, Chen LA, Cheng JY, Herdman M, Luo N. Systematic review reveals that EQ-5D minimally important differences vary with treatment type and may decrease with increasing baseline score. J Clin Epidemiol 2024;174:111487. https://doi.org/10.1016/j.jclinepi.2024.111487. PubMed PMID: 39084578.
[41] Rockwood K, Song X, MacKnight C, Bergman H, Hogan DB, McDowell I, et al. A global clinical measure of fitness and frailty in elderly people. CMAJ Can Med Assoc J 2005;173(5):489–95. https://doi.org/10.1503/cmaj.050051. PubMed PMID: 16129869; PubMed Central PMCID: PMC1188185.