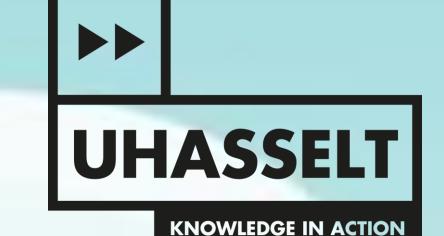
# Focus on prefrailty to prevent frailty



### The Effect of Exercise on Muscle Strength, Mobility and Balance in Prefrail Older Adults: a Systematic Review and Meta-analysis.

L. Casters, S. Pauwels, G. Laurent, M. Fabry, P. Meyns, J. Spildooren

### **INTRODUCTION**

Did you know that by 2050 one in five people will be aged 60 years or older?

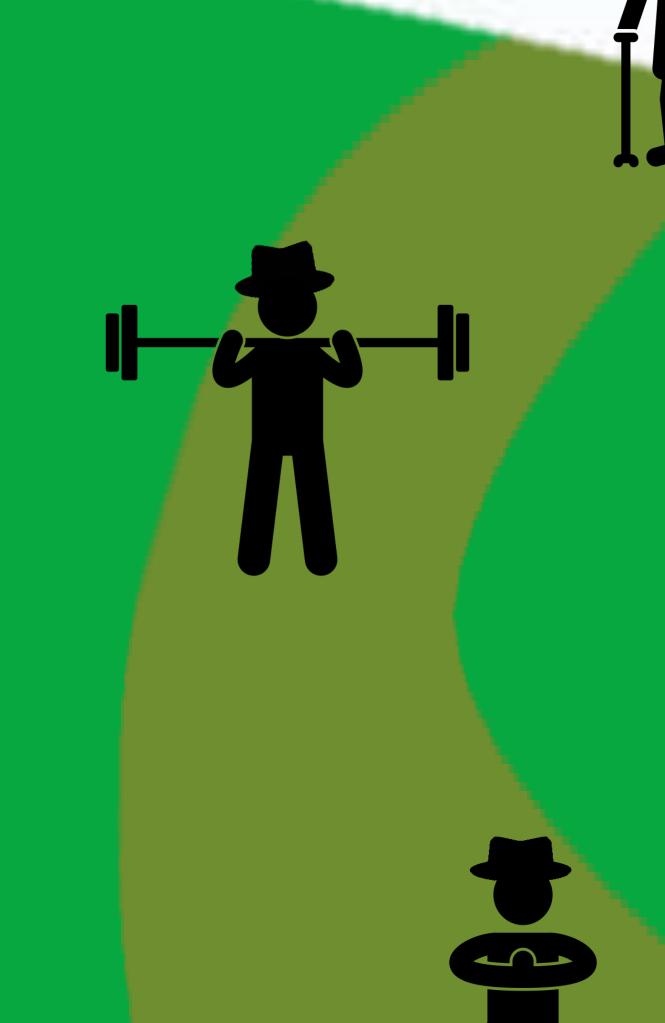
The proportion of older adults in the world is increasing dramatically. Unfortunately, these added life-years are not always spent in good health as the downside of this increased longevity is frailty. **Regular physical activity** is considered a countermeasure for frailty as it impacts physical function (i.e. muscle strength, muscle mass, balance, ..).

It is known that with the **progression of frailty**, reversing this condition becomes more difficult, but the effect of training in prefrailty, the precursor of frailty, has never been examined. Therefore, we examined the **effects of exercise on muscle** strength, mobility and balance in prefrail older adults and the effect on **frailty status**.

#### **METHODS**

three electronic databases: Pubmed, Web Of Science and Cochrane library 19 studies were retrieved after full-text screening

in total 1289 prefrail participants







3.5

became robust (improved) after the intervention

times more likely to improve frailty status

#### **POSITIVE EFFECT ON FRAILTY STATUS**

	Interven	Intervention		Control		Odds Ratio	Odds Ratio	
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Random, 95% Cl	M-H, Random, 95% Cl	
9.4.1 From prefrail to frail								
Barrachina-Igual et al., (2020	) 0	27	4	23	7.1%	0.08 [0.00, 1.55]		
Bray et al., (2020)	0	8	1	8	6.2%	0.29 [0.01, 8.37]	•	
Chatterjee et al., (2018)- NW	1	44	2	22	8.5%	0.23 [0.02, 2.72]	•	
Chen et al., (2020)	0	33	1	33	6.5%	0.32 [0.01, 8.23]	•	
Serra-Prat et al., (2017)	3	61	11	72	12.3%	0.29 [0.08, 1.08]		
Subtotal (95% CI)		173		158	<b>40.6</b> %	0.24 [0.09, 0.65]		
Total events	4		19					
Heterogeneity: Tau² = 0.00; Chi² = 0.66, df = 4 (P = 0.96); l² = 0%								
Test for overall effect: Z = 2.8	1 (P = 0.005)							
9.4.2 From prefrail to robust								
Barrachina-Igual et al., (2020	) 9	27	3	23	11.8%	3.33 [0.78, 14.26]		
Bray et al., (2020)	5	8	3	8	9.9%	2.78 [0.37, 21.03]		
Chatterjee et al., (2018)- NW	8	44	4	22	12.3%	1.00 [0.27, 3.77]		
Chen et al., (2020)	27	33	3	33	11.7%	45.00 [10.24, 197.73]		
Serra-Prat et al., (2017)	13	61	11	72	13.6%	1.50 [0.62, 3.65]		



#### WHAT IS PREFRAILTY?

Weight loss	Unintentional loss of >4,5 kg in the past year				
Weakness	Handgrip strength in the lowest 20% adjusted for sex and BMI				
Exhaustion	Self-reported poor energy and endurance				
Slowness	Walking speed in the lowest 20% adjusted for sex and height				
Low physical activity	Lowest 20% of Kcal expenditure during the past week				
Table 1: Frailty phenotype as proposed by Fried et al., (2001) 0/5 → Robust older adult 1-2/5 → Prefrail older adult					

#### 173 158 59.4% 3.49 [0.95, 12.76] Subtotal (95% CI) Total events 24 62 Heterogeneity: Tau<sup>2</sup> = 1.65; Chi<sup>2</sup> = 17.99, df = 4 (P = 0.001); $I^2$ = 78%. Test for overall effect: Z = 1.89 (P = 0.06) 316 100.0% 1.15 [0.38, 3.44] Total (95% CI) 346 Total events 43 66 Heterogeneity: Tau<sup>2</sup> = 2.09; Chi<sup>2</sup> = 35.90, df = 9 (P < 0.0001); l<sup>2</sup> = 75%. 0,005 0.1Test for overall effect: Z = 0.25 (P = 0.80) Favours control Favours intervention Test for subgroup differences: Chi<sup>2</sup> = 10.26, df = 1 (P = 0.001), l<sup>2</sup> = 90.2%

## CONCLUSION

**Exercise improves** muscle strength and mobility in prefrail older adults and is effective

at preventing or

Figure 1: the effect of exercise on frailty status

delaying the

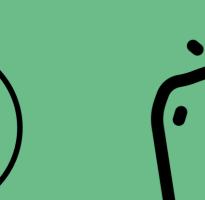
#### **EXERCISE IS EFFECTIVE FOR PHYSICAL FUNCTION**



Handgrip strength

+1.46 kg







Quadriceps strength

+ 7.5%(60°)

+ 5.25% (180°)



= (60°)

= (180°)

One leg balance



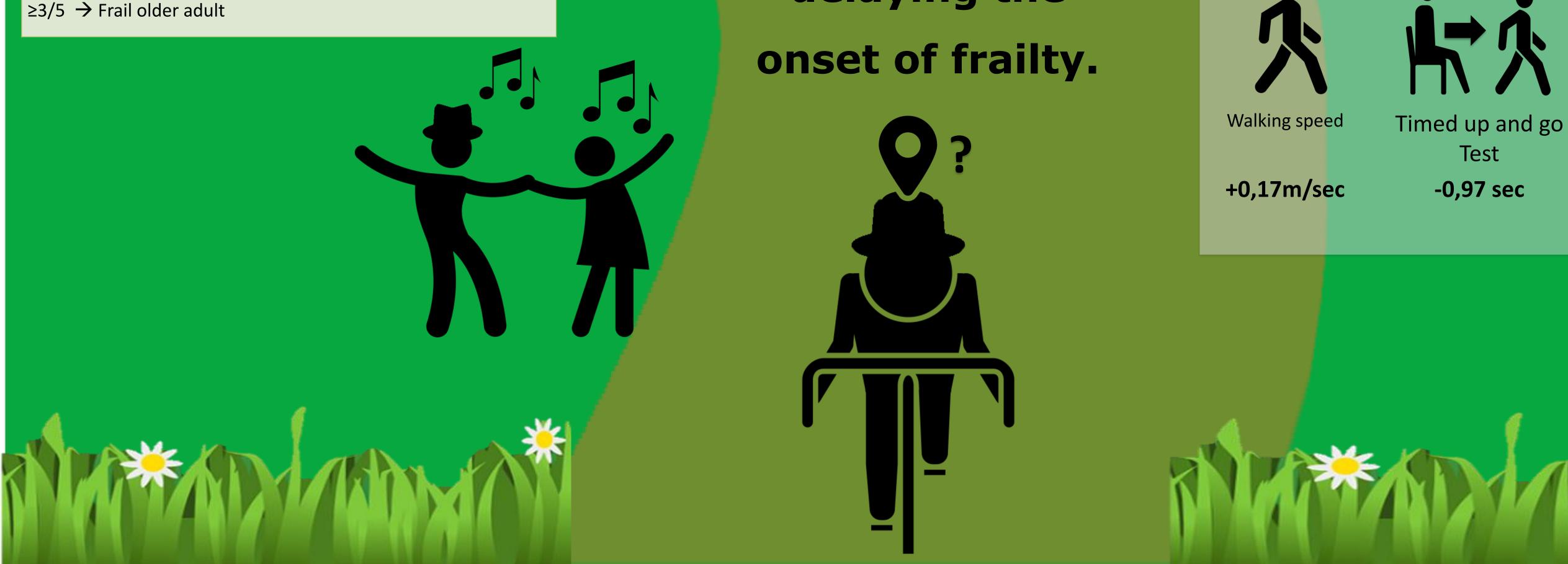
Semitandem

stance

200

5 time Sit to Stand Quadriceps power Test

-3,24 sec



Joke.spildooren@uhasselt.be