The Grow Your Muscle (GYM) Study: A 48-Week Physical Activity RCT in PWH and PWOH With Sarcopenia

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BACKGROUND

Sarcopenia is a common age-related syndrome marked by progressive muscle loss and linked to disability, falls, hospitalizations, and increased healthcare costs

- **Aim.** This study evaluated the efficacy of a 48-week home-based physical activity program on sarcopenia-related parameters in PWH ≥50 years and people PWOH ≥60 years, all with sarcopenia.

A 48-week home-based physical activity program was effective in improving muscle strength and mass in PWH ≥50 years with sarcopenia

METHODS

- **Design**: RCT of a structured home-based physical activity program (EXE group) vs. no program (control, non-EXE group)
- **Participants**: 98 PWH and 98 PWOH with sarcopenia, defined by BIA as ASMMI ≤7.0 (men) or ≤5.5 kg/m² (women), or SMI ≤10.75 (men) or ≤6.75 (women) kg/m².
- **Intervention**: 4 weekly 40-min sessions of exercises targeting major limb muscle groups and balance control, supported by a smartphone app with video tutorials and remote training monitoring (**Ref**). Both EXE and non-EXE participants were also instructed to train according to WHO recommendations, i.e., at least 150 min of physical activity/week.
- **Muscle measurements**: Handgrip, left and knee extension, chair-stand test, 6-min walking test, mini-BESTest (strength and function); fat/lean mass, SMI, ASSMI by BIA (mass).
- **Analyses**: comparison of % changes from BL of the above variables between groups at weeks 12 and 48 (Mann-Whitney test); correlation between continuous variables (Spearman correlation)

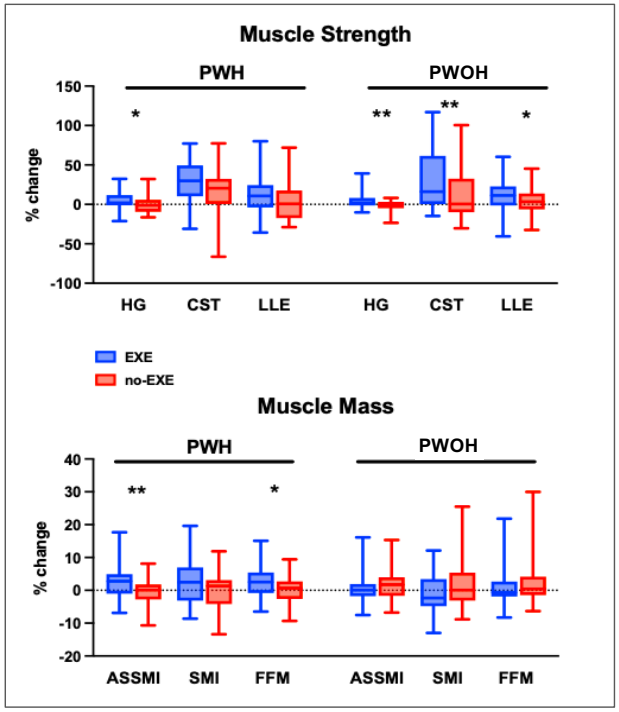
Table. Characteristics of the 142 participants who completed the study

	EXE (n=73)	Non-EXE (n=69)
	PWH (n=36)	PWH (n=33)
	PWOH (n=37)	PWOH (n=36)
Male sex (n, %)		
PWH	29 (80.6%)	25, 75.8%
PWOH	15 (40.5%)	18 (50%)
	p=0.0005	p=0.027
Age (years)		
PWH	60 (57-64)	63 (57-68)
PWOH (0.010)	67 (64-73)	71 (66-74)
	p<0.0001	p<0.0001
BMI (kg/m²)		
PWH	22.1 (21.2-23.3)	21.2 (20-23.2)
PWOH	22.4 (19.3-25.1)	23.5 (21.0-24.7)
	p=n.s	p=0.007

	EXE (n=36)	Non-EXE (n=33)
	PWH (n=36)	PWH (n=33)
ART		
NRTI + INSTI (n, %)	19 (52.8%)	18 (54.5%)
NRTI + NNRTI (n, %)	8 (22.2%)	9 (27.3%9
NRTI + PI (n, %)	3 (8.3%)	4 (12.1%)
NNRTI + INSTI (n, %)	2 (5.6%)	2 (6.1%)
PI + INSTI (n, %)	3 (8.3%)	0 (0.0%)
NRTI (n, %)	1 (2,8%)	0 (0.0%)
Current CD4+		
	837 (637-1047)	721 (570-1022)
Undetectable HIV-RNA		
	34, 94.4%	32, 97.0%

Legend. BIA: Bioelectrical impedance analysis; ASMMI: Appendicular Skeletal Muscle Mass index; SMI: Skeletal Muscle Mass Index.

Figure. Changes of muscle strength and mass measures at W48 in the 142 participants who completed the study.



Legend. HG, Hand-Grip; CST: Chair-Stand Test; LLE: Left Leg Extension; ASMMI: Appendicular Skeletal Muscle Mass index; SMI: Skeletal Muscle Mass Index; FFM: fat-free mass. *p<0.05; **p<0.001 (Wilcoxon-paired test)

RESULTS

- 142 of 196 participants (72.4%) completed the study: 69 PWH (70.4%) and 73 PWOH (x74.5%)(**Table**).

- **PWH:** EXE (n=36) vs. non-EXE (n=33). Significantly larger improvements of CST at W12 and of HG at W48; of ASSMI and FFM at W12 and W48.
- **PWOH:** EXE (n=37) vs. non-EXE (n=36). Significantly larger improvements of CST at W12 and W48, and of HG and LLE at W48, but not of muscle mass (**Figure**).
- PWH/PWOH: No significant differences in EXE vs. non-EXE for the other variables.

- **EXE-group**: PWH (n=36) vs. PWOH (n=37). Significantly larger improvements of ASSMI, SMI, and FFM at W48. No significant differences for the other variables
- **EXE-group** (n=73). ASSMI and lean mass changes correlated inversely with age. No significant differences according to sex at birth or age for the other variables

CONCLUSIONS

- This 48-week home-based physical activity program was feasible and effective in improving muscle strength and mass in PWH ≥50 years, and muscle strength in PWOH ≥60 years with sarcopenia.

- Integrating physical activity into clinical care may attenuate sarcopenia-related physical decline in PWH.

ADDITIONAL KEY INFORMATION

- **Ref.** Bonato M, Marmondi F, Mastropaolo C, Inzaghi C, Cerizza C, Galli L, Banfi G, Cinque P. A Digital Platform for Home-Based Exercise Prescription for Older People with Sarcopenia. Sensors (Basel). 2024 Jul 24;24(15):4788. doi: 10.3390/s24154788. PMID: 39123834; PMCID: PMC11314642.
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