

**Impact of Strength Training on Hemoglobin A1c Levels and Lean Body Mass in Patients
With Normal Weight Type 2 Diabetes: A Randomized Controlled Trial**

ESM Table 1. Comparison of Excluded/withdrawn and Included Participants at Baseline

	Excluded (N=100)^a	Included (N=186)	p-value
Age, median (IQR)	63(55.8, 68.0)	65(57.5, 68.5)	0.12
Male, No (%)	61 (61)	112 (60)	1.00
Race/ethnicity, No. (%)			0.001
White	23 (23)	17 (9)	
Asian	63 (63)	155 (83)	
Black	2 (2)	5 (3)	
Hispanic	6 (6)	3 (2)	
Other	6 (6)	6 (3)	
Bachelor's degree or higher, No. (%)	72 (72)	146 (78)	0.36
Smoking History, No. (%)			0.16
Current	3 (3)	1 (0.5)	
Former	15 (15)	29 (16)	
Diabetes factors, mean (SD)			
HbA _{1c} , mmol/mol	56.3 (10.9)	59.6 (13.1)	0.05
HbA _{1c} , % ^a	7.3 (1.0)	7.6 (1.2)	0.05
Duration of diabetes, y ^b	9.7 (6.5)	9.8 (6.8)	0.79
Anthropometrics, mean (SD)			
Weight, kg	69.2 (12.8)	65.5 (8.59)	0.01
Body mass index, kg/m ²	24.1 (3.3)	23.3 (1.6)	0.03
Blood pressure, mean (SD), mm Hg			
Systolic	128.6 (14.5)	132.5 (16.3)	0.04
Diastolic	77.7 (8.5)	78.6 (9.6)	0.42

^a Among 103 participants excluded, 100 were analyzed due to data availability.

^b Due to missing data, 8 participants from the excluded group were not included in the calculations.

^c Due to missing data, 12 participants from the excluded group and 10 participants from the included group were not included in the calculations.

^e Due to missing data, 6 participants from the excluded group and 4 participants from the included group were not included in the calculations.

ESM Table 2. Exercise Intervention Data for Individuals in Per-Adherence to Recommended Exercise Protocol Population

	Mean (SE) by Intervention Month								
	1	2	3	4	5	6	7	8	9
Strength									
Sessions/wk	2.7(.2)	2.7(.2)	2.7(.2)	2.5(.2)	2.7(.2)	2.8(.2)	2.8(.2)	2.7(.3)	2.8(.3)
Total weight lifted, kg/wk*	24,322 (3,242)	29,047 (3,717)	30,383 (3,725)	32,651 (4,746)	36,192 (5,319)	39,291 (6,283)	38,687 (5,580)	37,749 (5,992)	35,944 (5,708)
Weight, kg	63.4(1.6)	63.4(1.9)	62.8(1.8)	63.4(1.8)	63(1.8)	62.8(1.9)	62.1(1.8)	61.9(1.9)	62.9(2.0)
Aerobic									
Sessions/wk	2.8(.2)	2.9(.2)	2.6(.2)	2.8(.2)	2.7(.2)	2.8(.2)	2.8(.2)	2.7(.2)	2.6(.2)
Aerobic time, min/session	44(1.9)	44(1.9)	45(1.9)	45(2.0)	45(1.9)	45(1.9)	45.3(2)	47(3.1)	44(2.9)
Kcal/session	319(17)	301(19)	310(17)	310(18)	316(18)	304(16)	309(16)	299(18)	290(20)
Mean METs level†	6.1(.3)	6.2(.3)	6.2(.3)	6.1(.3)	6.2(.3)	6.1(.3)	6.4(.3)	6.3(.3)	6.5(.3)
% peak METs‡	70.2(2.0)	70(1.9)	71(2.1)	71.2(2.1)	69(2.2)	69.4(2.1)	69.8(1.8)	72.4(1.9)	73.6(2.0)
% HR reserve ‡	67.9(4.1)	67(3.8)	66.1(3.8)	66(4.5)	64.6(4.7)	62.2(4.2)	64.7(5.5)	60.3(4.9)	61(5.3)
Weight, kg	66.3(1.4)	65.5(1.5)	65.7(1.5)	66.1(1.5)	66.1(1.5)	66.1(1.5)	66.1(1.6)	65.1(1.6)	64.6(1.6)
Combination									
Sessions/wk	3.0(.2)	3.1(.2)	2.9(.2)	2.9(.3)	2.7(.2)	2.8(.3)	2.8(.2)	2.7(.2)	2.5(.2)
Aerobic time, min/session	36(2.4)	40(2.7)	40(2.7)	39(3.3)	38(3.0)	38(3.4)	38(3.2)	37(3.3)	37(2.9)
Kcal/session	323(32)	325(31)	337(35)	300(35)	294(30)	304(34)	301(32)	313(31)	322(27)
Mean METs level†	6.8(.4)	6.7(.4)	7.0(.4)	6.7(.5)	6.5(.3)	6.8(.4)	6.8(.3)	7.2(.4)	7.2(.5)
% peak METs‡	70.8(2.2)	67.8(2.5)	69.7(2.3)	69.6(2.2)	69.3(2.5)	69.6(2.5)	67.9(2.4)	71.3(2.9)	70.3(3.0)
% HR reserve ‡	63(4.2)	65.9(3.8)	61.3(3.8)	60.5(4.4)	60.8(4.4)	60.7(4)	58.7(4)	63(3.7)	62.3(3.7)
Total weight lifted, kg/wk*	8,461 (1,366)	8,580 (1,387)	8,806 (1,542)	8,673 (1,685)	8,285 (1,554)	9,498 (1,867)	9,802 (1,581)	8,344 (1,434)	7,723 (1,373)
Weight, kg	65.9(1.9)	65.8(1.9)	65.6(1.9)	64.7(2)	65(2.1)	65.3(2.2)	65.4(2.1)	66.6(2.1)	66.9(1.8)

MET, metabolic equivalent task; HR, heart rate.

*Weekly total weight lifted is the monthly mean of the total weight lifted each week for each participant.

†MET values were estimated from calories, weight, and time or pace and incline based on the availability of records.

‡Peak METs and peak heart rate values for each participant were obtained from stress tests.

ESM Table 3. Baseline, Follow-ups, and Change in HbA1c

	Baseline	3M	6M	9M	Change at 9M ^b	p-value
	HbA1c mean (95% CI) % ^a				mean (95% CI)	
Intention to Treat Analysis (N = 186)						
Strength	7.52 (7.20, 7.82)	7.15 (6.93, 7.39)	6.96* (6.73, 7.19)	7.11* (6.87, 7.33)	-0.44 (-0.78, -0.12)	0.02*
Aerobic	7.62 (7.31, 7.93)	7.35 (7.07, 7.64)	7.22 (6.91, 7.54)	7.14 (6.89, 7.39)	-0.24 (-0.57, 0.09)	0.13
Combination	7.62 (7.35, 7.89)	7.18 (6.90, 7.45)	7.00* (6.60, 7.37)	7.10 (6.80, 7.38)	-0.35 (-0.73, 0.02)	0.10
Per Protocol Analysis (N = 107)						
Strength	7.52 (7.16, 7.88)	7.17 (6.90, 7.46)	6.96* (6.69, 7.23)	7.07* (6.86, 7.27)	-0.51 (-0.90, -0.14)	0.02*
Aerobic	7.61 (7.27, 7.95)	7.41 (7.06, 7.77)	7.31 (6.94, 7.65)	7.25 (6.94, 7.53)	-0.20 (-0.63, 0.22)	0.34
Combination	7.52 (7.21, 7.83)	7.05 (6.79, 7.34)	6.86* (6.52, 7.21)	6.86 (6.49, 7.24)	-0.45 (-0.93, 0.04)	0.08

The crude unadjusted means at each time point are presented.

^a Values were obtained with all available measures at each time point.

^b Obtained with patients with follow up measures at 9 months.

* Significant decrease ($p < 0.05$) compared to baseline.