



**Figure S1.** Flowchart detailing participants' recruitment, randomization, and allocation for the placebo and intervention in the microbiome sub-group.

**Table S1:** Baseline demographic, clinical, and laboratory characteristics of the intervention and control groups participating in the microbiome sub-study [mean (SD)].

	<b>Total (n=23)</b>	<b>Intervention (n=12)</b>	<b>Control (n=11)</b>	<b><i>p</i>*</b>
Males/ Females [n (%)]	13 (56.5) / 10 (43.5)	7 (58.3%) / 5 (41.7)	6 (54.5%) / 5 (45.5)	NS
Age (years)	64.09 (12.47)	60.58 (12.55)	67.91 (11.75)	NS
Weight (kg)	96.34 (19.54)	90.46 (14.13)	102.75 (23.11)	NS
BMI (kg/m <sup>2</sup> )	34.56 (7.64)	32.43 (5.9)	36.89 (8.87)	NS
WC (cm)	111.87 (12.65)	104.42 (9.86)	120.00 (10.3)	<b>0.001</b>
SBP (mmHg)	129.43 (12.97)	124.83 (15.11)	134.45 (8.13)	NS
DBP (mmHg)	78.74 (11.32)	80.42 (11.48)	76.91 (11.39)	NS
FBG (mmol/L)	7.40 (0.91)	7.68 (1.14)	7.11 (0.44)	NS
HbA1c (%)	7.31 (0.50)	7.45 (0.58)	7.16 (0.38)	NS
TC (mmol/L)	3.78 (0.67)	3.75 (0.80)	3.81 (0.54)	NS
Trig (mmol/L)	1.48 (0.45)	1.55 (0.47)	1.40 (0.43)	NS
HDL-C (mmol/L)	1.03 (0.23)	1.09 (0.24)	0.96 (0.20)	NS
LDL-C (mmol/L)	2.07 (0.48)	2.13 (0.34)	2.01 (0.60)	NS
Creatin (umol/L)	79.58 (30.06)	86.65 (37.14)	60.13 (16.8)	NS
AST (U/L)	20.39 (0.56)	20.58 (5.73)	20.18 (9.46)	NS
ALT (U/L)	20.65 (9.97)	20.83 (6.86)	20.46 (12.92)	NS
γGT (U/L)	18.74 (7.68)	19.33 (6.73)	18.09 (8.88)	NS
Alk Phos (U/L)	60.30 (14.84)	55.83 (16.85)	65.18 (11.03)	NS

\*Comparison between intervention and control groups; NS = not significant. BMI: body mass index; WC: waist circumference; SBP: systolic blood pressure; DBP: diastolic blood pressure; FBG: fasting blood glucose; HbA1c: glycated hemoglobin; TC: total cholesterol; Trig: triglycerides, HDL-C: high density lipoprotein cholesterol; LDL-C: low density lipoprotein cholesterol; Creatin: creatinine; AST: aspartate aminotransferase; ALT: alanine aminotransferase; γGT: γ-glutamyl-transferase; Alk Phos: alkaline phosphatase.

**Table S2.** Anthropometric measures before and after intervention with probiotics or placebo in the microbiome sub-study [mean (SD)].

	<b>Probiotics (n=12)</b>			<b>Placebo (n=11)</b>			<b>P*</b>
	Baseline	3 mos	6 mos	Baseline	3 mos	6 mos	
<b>BMI</b>	32.43	31.87	31.49	36.89	37.10	37.57	<b>0.017</b>
<b>(kg/m<sup>2</sup>)</b>	(5.9)	(5.51)	(5.67)	(8.87)	(8.90)	(8.90)	
Change at 3 mos		-0.56 (0.88)			0.21 (0.75)		
Change at 6 mos			-0.94 (1.56)			0.68 (1.44)	
<b>WC (cm)</b>	104.42	103.00	101.17	120.00	121.09	122.18	<b>0.001</b>
	(9.86)	(9.29)	(8.85)	(10.30)	(10.52)	(10.63)	
Change at 3 mos		-1.42 (1.51)			1.09 (2.21)		
Change at 6 mos			-3.25 (2.77)			2.18 (4.26)	
<b>SBP</b>	124.83	123.33	127.33	134.45	134.45	135.36	NS
<b>(mmHg)</b>	(15.11)	(9.24)	(5.93)	(8.13)	(10.01)	(14.75)	
Change at 3 mos		-1.50 (11.74)			0.00 (7.21)		
Change at 6 mos			2.50 (17.78)			0.91 (13.25)	
<b>DBP</b>	80.42	80.00	78.55	76.91	78.82	78.55	NS
<b>(mmHg)</b>	(11.48)	(10.50)	(15.12)	(11.39)	(12.68)	(15.08)	
Change at 3 mos		-0.42 (2.57)			1.91 (3.86)		
Change at 6 mos			2.33 (5.91)			1.64 (7.76)	

\*P: comparison between groups by repeated measures ANOVA. BMI: body mass index; WC: waist circumference; SBP: systolic blood pressure; DBP: diastolic blood pressure

**Table S3.** Changes in glycemic and lipid parameters before and after the intervention with probiotics or placebo in the microbiome sub-study [mean (SD)].

	Probiotics (n=46)			Placebo (n=45)			P
	Baseline	3 mos	6 mos	Baseline	3 mos	6 mos	
<b>HbA1c</b>	7.45	6.98	6.73	7.16	7.20	7.18	<b>0.026</b>
<b>(%)</b>	(0.58)	(0.38)	(0.47)	(0.38)	(0.44)	(0.52)	
Change at 3 mos		-0.48 (0.30)			0.04 (0.12)		
Change at 6 mos			-0.73 (0.48)			0.02 (0.28)	
<b>FBG</b>	7.68	6.59	6.17	7.11	6.99	7.15	<b>0.057</b>
<b>(mmol/L)</b>	(1.15)	(0.66)	(0.70)	(0.44)	(0.43)	(0.67)	
Change at 3 mos		-1.09 (0.83)			-0.12 (0.31)		
Change at 6 mos			-1.51 (1.16)			0.04 (0.61)	
<b>TC</b>	3.75	3.63	3.54	3.82	3.79	3.97	NS
<b>(mmol/L)</b>	(0.80)	(0.71)	(0.65)	(0.54)	(0.47)	(0.57)	
Change at 3 mos		-0.12 (0.26)			-0.02 (0.19)		
Change at 6 mos			-0.21 (0.35)			0.16 (0.34)	
<b>Trig</b>	1.55	1.49	1.47	1.40	1.48	1.60	<b>0.030</b>
<b>(mmol/L)</b>	(0.47)	(0.43)	(0.46)	(0.43)	(0.47)	(0.53)	
Change at 3 mos		-0.06 (0.07)			0.08 (0.08)		
Change at 6 mos			-0.07 (0.11)			0.20 (0.15)	
<b>HDL-C</b>	1.09	1.10	1.12	0.96	0.93	0.91	NS
<b>(mmol/L)</b>	(0.24)	(0.26)	(0.27)	(0.20)	(0.17)	(0.16)	
Change at 3 mos		0.01 (0.04)			-0.03 (0.06)		
Change at 6 mos			0.03 (0.07)			-0.05 (0.12)	
<b>LDL-C</b>	2.13	2.05	2.10	2.01	1.97	2.02	NS
<b>(mmol/L)</b>	(0.34)	(0.34)	(0.40)	(0.60)	(0.52)	(0.53)	
Change at 3 mos		-0.09 (0.13)			-0.04 (0.12)		
Change at 6 mos			-0.03 (0.26)			0.01 (0.10)	

P: comparison between groups by the two-factor mixed repeated measures ANOVA, adjusted for change in WC at 6 months. HbA1c: glycated hemoglobin; FBG: fasting blood glucose; TC: total cholesterol; Trig: triglycerides, HDL-C: high density lipoprotein cholesterol; LDL-C: low density lipoprotein cholesterol