

**Supplemental table 1.** Characteristics of the population (n=2095) and associations of testosterone, SHBG and DHEAS with

relevant cofounders.

		Bioavaible testo (nmol/L)	Free testo (nmol/L)	Free testo (pmol/L)	DHEAS (mg/l)
		Median (IQR)	Median (IQR)	Median (IQR)	Median (IQR)
Often sleepless	Yes	6.8 (5.3; 8.4)	279.0 (210.7; 352.2)	28.1 (23.1; 37.0)	1.4 (0.9; 2.1)
	No	7.3 (5.8; 8.8)	291.1 (235.1; 353.3)	31.3 (24.2; 40.9)	1.4 (1.0; 2.0)
		p=.012	p=.010	p=.004	p=.539
Often very tired	Yes	7.2 (5.6; 9.1)	292.9 (228.5; 369.7)	30.3 (23.7; 38.4)	1.4 (0.9; 2.1)
	No	7.2 (5.8; 8.7)	289.2 (233.4; 350.8)	31.1 (24.1; 40.8)	1.5 (1.0; 2.0)
		p=.985	p=.748	p=.165	p=.496
Self-reported total hours of sleep	<7 hours of sleep	7.3 (5.99; 8.89)	294.3 (241.0; 359.4)	31.0 (25.3; 40.9)	1.49 (1.0; 2.0)
	7-9 hours of sleep	7.2 (5.75; 8.76)	289.6 (231.1; 352.4)	30.9 (23.8; 39.8)	1.44 (1.0; 2.1)
	>9 hours of sleep	5.9 (4.76; 7.58)	245.7 (192.4; 316.6)	32.4 (21.4; 44.4)	1.21 (0.8; 1.8)
		p<.001	p<.001	p=.456	p=.014
Age	35-45	8.5 (7.0; 10.3)	336.4 (276.0; 399.5)	26.3 (19.5; 33.0)	1.9 (1.5; 2.5)
	45-55	7.3 (5.9; 8.9)	295.1 (236.1; 356.5)	30.5 (23.7; 39.3)	1.5 (1.1; 2.1)
	55-60	6.3 (5.1; 7.7)	259.77 (208.2; 322.1)	35.2 (27.0; 45.1)	1.1 (0.7; 1.5)
		p<.001	p<.001	p<.001	p<.001
Body mass index	Underweight (<18,5 kg/m2)	6.7 (5.8; 7.3)	286.1 (230.6; 328.0)	65.6 (32.6; 87.7)	2.0 (0.6; 2.8)
	Normal (18,5-25 kg/m2)	7.7 (6.2; 9.5)	310.2 (247.5; 376.5)	36.1 (27.9; 45.2)	1.6 (1.1; 2.1)
	Overweight (25-30 kg/m2)	7.3 (5.9; 8.8)	292.9 (235.4; 355.8)	30.0 (23.9; 38.2)	1.4 (1.0; 2.0)
	Obese (>30 kg/m2)	6.1 (4.8; 7.4)	251.0 (200.1; 300.5)	26.2 (19.9; 34.5)	1.3 (0.8; 1.9)
		p<.001	p<.001	p<.001	p<.001
Smoking status	Daily smoker	7.8 (6.1; 9.4)	320.0 (247.1; 384.7)	35.4 (26.9; 44.4)	1.7 (1.1; 2.3)
	Occasional smoker	6.9 (5.4; 8.3)	278.8 (218.4; 325.0)	26.8 (21.5; 34.6)	1.5 (1.0; 1.9)
	Former smoker	6.8 (5.5; 8.4)	275.0 (218.2; 336.0)	30.2 (23.3; 38.9)	1.3 (1.0; 1.9)
	Never smoker	5.9 (5.9; 8.7)	288.2 (237.6; 347.1)	29.9 (23.4; 39.2)	1.5 (1.0; 2.1)
		p<.001	p<.001	p<.001	p<.001
Alcohol intake (units per week)	0 units of alcohol	7.2 (5.5; 9.2)	284.9 (218.9; 370.9)	31.1 (25.1; 42.8)	1.4 (0.9; 2.1)
	1-14 units of alcohol	7.3 (5.8; 8.7)	291.4 (231.7; 349.4)	30.8 (23.7; 39.6)	1.4 (1.0; 2.0)
	> 14 units of alcohol	7.1 (5.8; 8.8)	287.0 (234.9; 256.5)	31.2 (24.6; 41.2)	1.5 (1.1; 2.1)
		p=.969	p=.893	p=.449	p=.003
Physical activity	Mainly sedentary	6.8 (5.6; 8.5)	277.1 (227.9; 347.3)	28.9 (21.6; 37.6)	1.4 (1.0; 2.1)
	Light to moderate activity	7.2 (5.7; 8.7)	288.9 (229.3; 351.9)	30.8 (23.8; 39.8)	1.4 (1.0; 2.0)
	Regular sport and exercise	7.4 (6.0; 8.9)	295.5 (242.6; 360.9)	33.5 (26.3; 42.3)	1.5 (1.0; 2.0)
	Athletic training	8.0 (6.6; 9.7)	320.7 (263.5; 372.9)	31.0 (22.2; 42.9)	1.6 (1.2; 2.2)
		p=.003	p=.035	p<.001	p=.317

P-values are found with the Kruskal-Wallis test.

Bio testosterone, Bioavaible testosterone; SHBG, sex-hormone binding globulin; DHEAS, dehydroepiandrosterone-sulphate, IQR; interquartile range.