Appendix 4. Anthropometrics, body composition, and bone density measures.

Study	Body Weight / Anthropometrics (mean ± SD)	Body Composition (mean ± SD)	Bone Density (mean ± SD)
Andreoli 2012	Height: Running FA = 162.9 ± 5.6 cm, Swimming FA = 167.8 ± 6.5 cm, Controls = 157.2 ± 7.5 cm, p value not stated Weight: Running FA = 60.2 ± 7.9 kg, Swimming FA = 67.8 ± 12.6 kg, Controls = 62.6 ± 6.4 kg, p value not stated BMI: Running FA = 22.6 ± 2.5, Swimming FA = 23.9 ± 3.2, Controls = 25.3 ± 1.7, p value not stated	Lean Body Mass: Running FA = 42.8 ± 3.9 kg, Swimming FA = 46.1 ± 5.6 kg, Controls = 37.9 ± 3.7 kg, $p < 0.001$ Fat Mass: Running FA = 15.6 ± 4.3 kg, Swimming FA = 19.8 ± 8.1 kg, Controls = 23.4 ± 4.3 kg, $p < 0.001$ Percent Body Fat: Running FA = 25.4 ± 4.2%, Swimming FA = 28.3 ± 6.7%, Controls = 37.0 ± 4.6%, $p < 0.001$ Left Arm Fat Mass: Running FA = 1.0 ± 0.3 kg, Swimming FA = 1.5 ± 0.7 kg, Controls = 1.9 ± 0.4 kg, runners compared with controls $p < 0.001$, swimmers compared with controls $p < 0.01$ Right Arm Fat Mass: Running FA = 1.1 ± 0.3 kg, Swimming FA = 1.6 ± 0.6 kg, Controls = 2.0 ± 0.5 kg, runners compared with controls $p < 0.001$, swimmers compared with controls $p < 0.01$ Trunk Fat Mass: Running FA = 7.1 ± 1.9 kg, Swimming FA = 8.1 ± 4.7 kg, Controls = 10.5 ± 2.3 kg, $p < 0.001$ Left Leg Fat Mass: Running FA = 3.1 ± 0.9 kg, Swimming FA = 3.7 ± 1.1 kg, Controls = 3.9 ± 0.9 kg, p value not stated Right Leg Fat Mass: Running FA = 3.1 ± 1.0 kg, Swimming FA = 3.8 ± 1.1 kg, Controls = 3.9 ± 1.2 kg, p value not stated Left Arm Lean Mass: Running FA = 2.2 ± 0.2 kg, Swimming FA = 2.8 ± 0.3 kg, Controls = 2.0 ± 0.2 kg, swimmers compared with controls $p < 0.001$, swimmers compared with runners $p < 0.001$	Left Arm BMD: Running FA = 0.692 ± 0.074 g/cm², Swimming FA = 0.703 ± 0.057 g/cm², Controls = 0.640 ± 0.080 g/cm², p value not stated Right Arm BMD: Running FA = 0.716 ± 0.088 g/cm², Swimming FA = 0.710 ± 0.063 g/cm², Controls = 0.647 ± 0.068 g/cm², p value not stated Thoracic Spine BMD: Running FA = 0.795 ± 0.100 g/cm², Swimming FA = 0.774 ± 0.081 g/cm², Controls = 0.694 ± 0.140 g/cm², runners compared with controls $p < 0.01$ Lumbar Spine BMD: Running FA = 1.162 ± 0.198 g/cm², Swimming FA = 1.051 ± 0.126 g/cm², Controls = 0.938 ± 0.164 g/cm², runners compared with controls $p < 0.01$ Left Leg BMD: Running FA = 1.130 ± 0.144 g/cm², Swimming FA = 1.043 ± 0.099 g/cm², Controls = 0.921 ± 0.107 g/cm², runners compared with controls $p < 0.001$, swimmers compared with controls $p < 0.01$ Right Leg BMD: Running FA = 1.115 ± 0.138 g/cm², Swimming FA = 1.062 ± 0.090 g/cm², Controls = 0.942 ± 0.112 g/cm², runners compared with controls $p < 0.001$, swimmers compared with controls $p < 0.01$ Left Arm BMC: Running FA = 134.9 ± 21.5 g, Swimming FA = 155.6 ± 24.3 g, Controls = 121.8 ± 23.5 g, swimmers compared with controls $p < 0.001$ Right Arm BMC: Running FA = 146.8 ± 28.2 g, Swimming FA = 155.5 ± 27.3 g, Controls = 128.3 ± 23.7 g, swimmers compared with controls $p < 0.001$ Trunk BMC: Running FA = 497.3 ± 83.5 g, Swimming FA = 493.6 ± 71.3 g, Controls = 400.7 ± 74.6 g, runners compared with controls $p < 0.001$, swimmers compared with controls $p < 0.001$

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Study	Body Weight / Anthropometrics (mean ± SD)	Body Composition (mean ± SD)	Bone Density (mean ± SD)
Andreoli 2012 (cont.)		Right Arm Lean Mass: Running FA = 2.4 ± 0.2 kg, Swimming FA = 2.9 ± 0.4 kg, Controls = 2.1 ± 0.4 kg, swimmers compared with controls p < 0.001, swimmers compared with runners p < 0.01 Trunk Lean Mass: Running FA = 19.1 ± 0.5 kg, Swimming FA = 22.4 ± 3.2 kg, Controls = 18.6 ± 1.9 kg, p value not stated Left Leg Lean Mass: Running FA = 6.8 ± 0.8 kg, Swimming FA = 7.1 ± 0.9 kg, Controls = 5.7 ± 0.6 kg, runners compared with controls p< 0.001, swimmers compared with controls p < 0.001 Right Leg Lean Mass: Running FA = 6.9 ± 0.7 kg, Swimming FA = 7.4 ± 1.0 kg, Controls = 6.0 ± 0.7 kg, runners compared with controls p< 0.001, swimmers compared with controls p < 0.001	Left Leg BMC: Running FA = 372.8 ± 77.0 g, Swimming FA = 360.8 ± 50.5 g, Controls = 272.7 ± 52.3 g, runners compared with controls p < 0.001, swimmers compared with controls p < 0.001 Right Leg BMC: Running FA = 389.6 ± 76.5 g, Swimming FA = 382.9 ± 56.7 g, Controls = 289.6 ± 50.5 g, runners compared with controls p < 0.001, swimmers compared with controls p < 0.001
Arliani 2014	BMI: FA = 25.73 ± 3.15, Controls = 28.35 ± 3.66, p = 0.006		
Babaei 2014	Weight: FA Aerobic Group = 80 ± 7.8 kg, FA Anaerobic Group = 73.83 ± 8.58 kg, Controls Aerobic Group = 73.83 ± 8.58 kg, Controls Anaerobic Group = 77.21 ± 7.17 kg, aerobic groups p = 0.7, anaerobic groups p = 0.35 Height: FA Aerobic Group = 177.6 ± 8.26 cm, FA Anaerobic Group = 171.22 ± 6.07 cm, Controls Aerobic Group = 173.47 ± 5.31 cm, Controls Anaerobic Group = 175.47 ± 4.15 cm, aerobic groups p = 0.2, anerobic groups p = 0.15 BMI: FA Aerobic Group = 24.65 ± 1.15, FA Anaerobic Group = 24.60 ± 1.5, Controls Aerobic Group = 27.04 ± 2.88, Controls Anaerobic Group = 27.55 ± 3.05, aerobic groups p = 0.03, anaerobic groups p = 0.02		
Batista 2013	BMI: Elite FA = 24.7 ± 0.2, Non-Elite FA = 26.1 ± 0.3, Controls = 27.1 ± 0.3, p < 0.001	Waist Circumference: Elite FA = Men 97.6 ± 0.9 cm, Women 85.7 ± 0.5 cm, Non-Elite FA = Men 98.3 ± 0.9 cm, Women 90.6 ± 0.6 cm, Controls = Men 96.7 ± 1.3 cm, Women 93.0 ± 0.8 cm, men p = 0.603, women p < 0.001	

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Study	Body Weight / Anthropometrics (mean ± SD)	Body Composition (mean ± SD)	Bone Density (mean ± SD)
Batista 2014	BMI: Elite FA = men 26.4 ± 3.1, women 22.7 ± 1.9, Non-Elite FA = men 26.5 ± 3.7 , women 25.9 ± 3.4, Controls = men 26.5 ± 3.6, women 27.7 ± 4.8, men p = 0.963, women p < 0.001 Overweight/Obesity (%): Elite FA = men 73%, women 20%, Non-Elite FA = men 64%, women 65%, Controls = men 69%, women 74%, men p = 0.313, women p < 0.001		
Chang 2009	Weight: DHS FA = 111.3 ± 18.4 kg, ACLS FA = 110.6 ± 19.6 kg, DHS Controls = 96.3 ± 14.5 kg, ACLS Controls = 94.6 ± 14.7 kg, DHS and ACLS p < 0.001 Height: DHS FA = 187.4 ± 7.1 cm, ACLS FA = 186.2 ± 6.9 cm, DHS Controls = 175.1 ± 7.6 cm, ACLS Controls = 179.8 ± 7.4 cm, DHS and ACLS p < 0.001 BMI: DHS FA = 31.5 ± 4.2, ACLS FA = 31.7 ± 4.7, DHS Controls = 31.4 ± 4.0, ACLS Controls = 28.6 ± 3.1, ACLS p < 0.001	Waist Circumference: DHS FA = 103.8 ± 11.5 cm, ACLS FA = 105.7 ± 12.7 cm, DHS Controls = 107.4 ± 10.9 cm, ACLS Controls = 98.4 ± 8.9 cm, DHS p = 0.007, ACLS p < 0.001 Waist to Hip Ratio: DHS FA = 1.08 ± 0.85, ACLS FA = 1.06 ± 0.73, DHS Controls = 0.98 ± 0.05, ACLS Controls = 0.93 ± 0.05, DHS p < 0.001, ACLS p < 0.001	
Dey 2002	Height : PAFA = 171.8 ± 5.96 cm, SFA = 170.0 ± 5.70 cm, Controls = 163.1 ± 6.01 cm, PAFA compared with SFA p < 0.01, PAFA compared with controls p < 0.01, SFA compared with controls p < 0.01 Weight : PAFA = 66.8 ± 6.30 kg, SFA = 72.2 ± 6.69 kg, Controls = 64.9 ± 4.86 kg, PAFA compared with SFA p < 0.01, PAFA compared with controls p < 0.01, SFA compared with controls p < 0.01 BMI : PAFA = 22.6 ± 1.71, SFA = 25.0 ± 1.60, Controls = 24.3 ± 1.97, PAFA compared with SFA p < 0.01, PAFA compared with controls p < 0.01, SFA compared with controls p < 0.01	Waist to Hip Ratio : PAFA = 0.89 ± 0.03, SFA = 0.91 ± 0.07, Controls = 0.95 ± 0.08, PAFA compared with SFA p value not stated, PAFA compared with controls p < 0.01, SFA compared with controls p < 0.01 Waist to Thigh Ratio : PAFA = 1.53 ± 0.09, SFA = 1.66 ± 0.12, Controls = 1.87 ± 0.24, PAFA compared with SFA p < 0.01, PAFA compared with controls p < 0.01, SFA compared with controls p < 0.01 Percent Body Fat : PAFA = 18.3 ± 2.71%, SFA = 24.7 ± 1.47%, Controls = 24.5 ± 3.76%, PAFA compared with SFA p < 0.01, PAFA compared with controls p < 0.01, SFA compared with controls p value not stated	

Study	Body Weight / Anthropometrics (mean ± SD)	Body Composition (mean ± SD)	Bone Density (mean ± SD)
Grashow 2022	BMI: Total FA = 31.69 ± 5.12, 25-29 age FA = 30.25 ± 4.37, 30-39 age FA = 31.43 ± 5.05, 40-49 age FA = 32.21 ± 5.33, 50-59 age FA = 31.84 ± 5.27, Total NHANES Controls = 30.0 ± 7.1, 25-29 age NHANES Controls = 27.9 ± 6.9, 30-39 age NHANES Controls = 30.37 ± 8.0, 40-49 age NHANES Controls = 30.99 ± 6.6, 50-59 age NHANES Controls = 29.68 ± 6.3, Total NHIS Controls = 28.4 ± 4.8, 25-29 age NHIS Controls = 27.2 ± 5.0, 30-39 age NHIS Controls = 27.7 ± 4.7, 40-49 age NHIS Controls = 28.9 ± 4.7, 50-59 age NHIS Controls = 28.9 ± 4.8, p values not stated		
Hagmar 2006	Height: FA = 163.5 ± 7.4 cm, Controls = 165.2 ± 7.4 cm, p value not stated Weight: FA = 59.0 ± 7.8 kg, Controls = 66.2 ± 8.2 kg, p = 0.012 BMI: FA = 22.0 ± 2.2, Controls = 24.3 ± 2.8, p = 0.015	Percent Fat Mass: FA = 28.3 ± 7.1%, Controls = 34.5 ± 8.4%, p = 0.028 Upper Body to Lower Body Fat Mass: FA = 0.7 ± 0.2, Controls = 0.8 ± 0.2, p value not stated Percent Lean Body Mass: FA = 68.4 ± 6.9%, Controls = 62.2 ± 7.6%, p = 0.010	Total BMD: FA = 1.103 ± 0.108 g/cm^2, Controls = 1.057 ± 0.097 g/cm^2, p value not stated Spine BMD: FA = 1.023 ± 0.139 g/cm^2, Controls = 1.018 ± 0.173 g/cm^2, p value not stated
Hurst 2010	Height: FA = 1.9 ± 0.01 m, Controls = 1.8 ± 0.1 m, p < 0.001 Weight: FA = 111.0 ± 18.9 kg, Controls = 99.4 ± 10.9 kg, p < 0.001 BMI: FA = 31.5 ± 4.5 kg/m^2, Controls = 31.0 ± 2.7 kg/m^2, p = 0.18	Body Surface Area: FA = 2.6 ± 0.2 m^2, Controls = 2.3 ± 0.2 m^2, p < 0.001	
Kettunen 2001	Endurance FA = 24.6 ± 2.8, Track and Field FA = 25.3 ± 2.9, Team Sport FA = 26.4 ± 3.0, Power Sport FA = 28.0 ± 4.1, Marksmen FA = 25.7 ± 3.3, Controls = 26.8 ± 3.7, p values not stated		
Kettunen 2010	BMI: 1985 FA = 26.1 ± 3.4, 1992 Total FA = 26.9 ± 3.5, 1992 Soccer FA = 26.8 ± 3.4, 1992 Endurance FA = 25.3 ± 2.8, 1992 Weightlifting FA = 28.7 ± 3.6, 1985 Controls = 26.4 ± 3.6, 1992 Controls = 27.9 ± 3.8, 1985 p value = 0.068, no p value stated for 1992		Femoral Neck Areal BMD: Total FA = 0.992 ± 0.169 g/cm^2, Soccer FA = 1.032 ± 0.163 g/cm^2, Endurance FA = 0.977 ± 0.145 g/cm^2, Weightlifting FA = 0.962 ± 0.191 g/cm^2, Controls = 0.905 ± 0.131 g/cm^2, total athletes to controls p < 0.0001 Trochanter Areal BMD: Total FA = 0.923 ± 0.146 g/cm^2, Soccer FA = 0.969 ± 0.131 g/cm^2, Endurance FA = 0.885 ± 0.128 g/cm^2, Weightlifting FA = 0.908 ± 0.169 g/cm^2, Controls = 0.860 ± 0.121 g/cm^2, total athletes to controls p = 0.0002 but adjusted for age and BMI p < 0.0001

Study	Body Weight / Anthropometrics (mean ± SD)	Body Composition (mean ± SD)	Bone Density (mean ± SD)
Majerczak 2019	Height: Endurance FA = 175 ± 5.1 cm, Sprint FA = 181 ± 7.5 cm, Controls = 174 ± 5.9 cm, p value not stated Weight : Endurance FA = 78.1 ± 9.3 kg, Sprint FA = 87.8 ± 11.1 kg, Controls = 79.7 ± 10 kg, p < 0.001 BMI : Endurance FA = 25.7 ± 3.5 kg/m^2, Sprint FA = 26.8 ± 3.3 kg/m^2, Controls = 26.3 ± 2.5 kg/m^2, p value not stated	Percent Body Fat: Endurance FA = 24.2 ± 6.5%, Sprint FA = 24.8 ± 6.5%, Controls = 26.1 ± 3.9%, p value not stated	
Pihl 2003	Height: PAFA = 180 ± 6.6 cm, SFA = 179 ± 7.1 cm, Controls = 181.2 ± 6.1 cm, p values not stated Weight: PAFA = 81.1 ± 10.9 kg, SFA = 93.4 ± 13 kg, Controls = 89.8 ± 12.6 kg, PAFA to SFA p < 0.001, to controls p < 0.05 BMI: PAFA = 25 ± 2.4, SFA = 29.1 ± 3.2, Controls = 27.3 ± 3.1, PAFA to SFA p < 0.001, to controls p < 0.01	Percent Body Fat: PAFA = 15.9 ± 5.1%, SFA = 25.3 ± 4.6%, Controls = 22.8 ± 5.9%, PAFA to SFA p < 0.001, to controls p < 0.001 Waist to Hip Ratio: PAFA = 0.88 ± 0.04, SFA = 0.94 ± 0.04, Controls = 0.9 ± 0.05, PAFA to SFA p < 0.001, to controls p < 0.05	
Raty 2002	Height: Soccer FA = 177 ± 5 cm, Weightlifting FA = 166 ± 6 cm, Running FA = 173 ± 5 cm, Marksmen FA = 175 ± 7 cm, 47 year old Controls = 178.7 ± 6.6 cm, 57 year old Controls = 175.1 ± 6.6 cm, athletes p < 0.0001, controls p < 0.0001 Weight: Soccer FA = 84 ± 12.5 kg, Weightlifting FA = 78 ± 13.2 kg, Running FA = 75.6 ± 10 kg, Marksmen FA = 81.5 ± 8.1 kg, 47 year old Controls = 85.9 ± 12.4 kg, 57 year old Controls = 83.4 ± 11.2 kg, athletes p = 0.034, controls p < 0.001 BMI: Soccer FA = 26.9 ± 3.5 kg/m^2, Weightlifting FA = 28.1 ± 3.5 kg/m^2, Running FA = 25.2 ± 2.9 kg/m^2, Marksmen FA = 26.7 ± 2.6 kg/m^2, 47 year old Controls = 27.1 ± 3.6 kg/m^2, 57 year old Controls = 27.2 ± 3.4 kg/m^2, athletes p = 0.016, controls p < 0.0001		

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Study	Body Weight / Anthropometrics (mean ± SD)	Body Composition (mean ± SD)	Bone Density (mean ± SD)
Ravi 2020	Height: Competitive FA = 166.4 cm, Regular Physical Activity Controls = 165.6 cm, No Exercise Controls = 164.7 cm, p = 0.074 Weight: Competitive FA = 70.3 kg, Regular Physical Activity Controls = 70.3 kg, No Exercise Controls = 68.5 kg, p = 0.182 BMI: Competitive FA = 25.4 kg/m^2, Regular Physical Activity Controls = 25.6 kg/m^2, No Exercise Controls = 25.2 kg/m^2, p = 0.431	Total Fat Mass: Competitive FA = 24.0 kg, Regular Physical Activity Controls = 25.5 kg, No Exercise Controls = 24.4 kg, p = 0.141 Percent Fat Mass: Competitive FA = 33.3%, Regular Physical Activity Controls = 35.4%, No Exercise Controls = 35.0%, p = 0.028 Fat Mass Index: Competitive FA = 8.7 kg/m^2, Regular Physical Activity Controls = 9.3 kg/m^2, No Exercise Controls = 9.0 kg/m^2, p = 0.143 Total Lean Mass: Competitive FA = 43.7 kg, Regular Physical Activity Controls = 42.1 kg, No Exercise Controls = 41.4 kg, p < 0.001 Lean Mass Index: Competitive FA = 15.8 kg/m^2, Regular Physical Activity Controls = 15.3 kg/m^2, No Exercise Controls = 15.2 kg/m^2, p = 0.002 Appendicular Lean Mass Index: Competitive FA = 6.9 kg/m^2, Regular Physical Activity Controls = 6.6 kg/m^2, No Exercise Controls = 6.6 kg/m^2, p < 0.001	Femoral Neck BMD: Competitive FA = 1.00 g/cm^2 (0.98-1.03), Regular Physical Activity Controls = 0.96 g/cm^2 (0.95-0.97), No Exercise Controls = 0.95 g/cm^2 (0.93-0.97), p < 0.001
Schmitt 2004	BMI: Javelin Throwing FA = 28 [24-32], High Jumping FA = 23 [21-28], Javelin Throwing Controls = 28 [24-32], High Jumping Controls = 24 [21-28], p value not stated		
Simon 2017		Percent Body Fat: FA = 28.47 ± 6.88%, Controls = 20.89 ± 6.97%, p < 0.01	
Stracciolini 2020	Obesity (%): FA = Yes 22/699, No 677/699, Controls = Yes 61/901, No 840/901, p = 0.001		
Unt 2008	Height: PAFA = 182.3 ± 7.0 cm, SFA = 179.3 ± 6.9 cm, Controls = 181.6 ± 5.6 cm, p value not stated Weight : PAFA = 84.4 ± 11.6 kg, SFA = 92.2 ± 12.9 kg, Controls = 90.9 ± 13.6 kg, PAFA compared with SFA p < 0.05 BMI : PAFA = 25.3 ± 2.4, SFA = 28.7 ± 3.1, Controls = 27.5 ± 3.4, PAFA compared with SFA p < 0.001, PAFA compared with controls p < 0.01	Percent Body Fat: PAFA = 15.9 ± 4.7%, SFA = 24.5 ± 4.7%, Controls = 22.2 ± 5.9%, PAFA compared with SFA and controls p < 0.001	