



Sarcopenia cut-points for African women

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Sub-Saharan African **MuSculOskeletal Network (SAMSON)**

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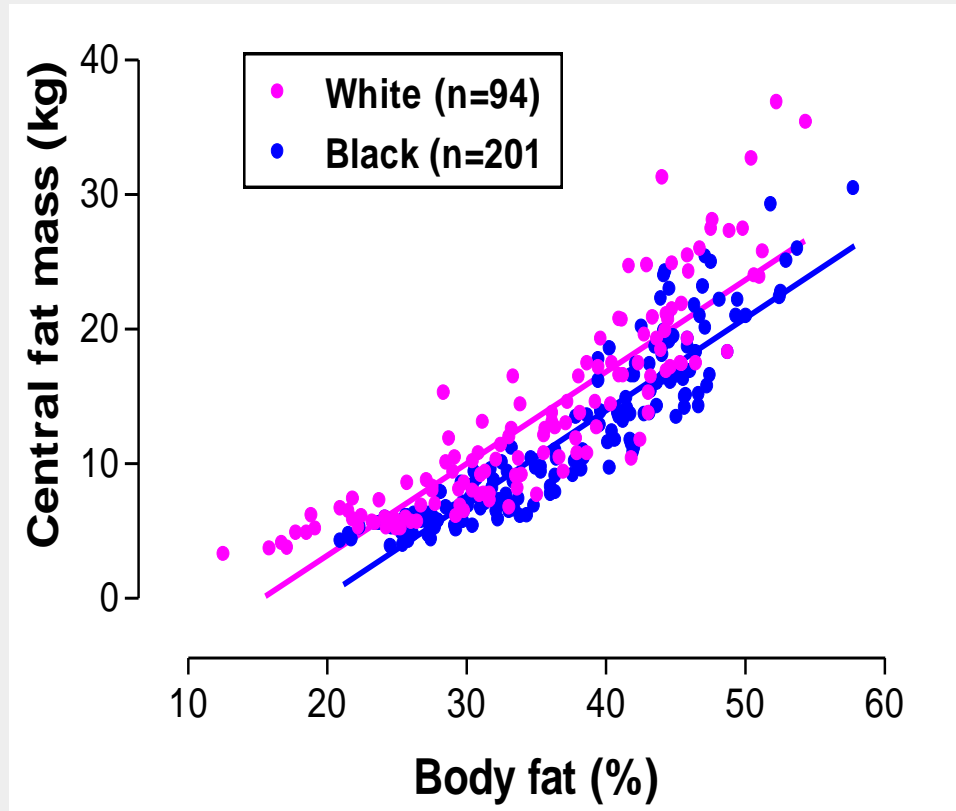
Monday 19 - Thursday 22 March 2018

Definition of sarcopenia

- Age related loss of muscle mass, strength and function;
- A condition associated with decreased physical functioning, frailty, falls and mortality in older adults
- Similar to what happens to the bone with osteoporosis;
- Considerations:
 - Muscle declines with age while FM increases;
 - Height, adiposity and muscle mass differ in different populations
- Standard criteria are required for different populations



AFRICAN-SPECIFIC BODY FAT DISTRIBUTION



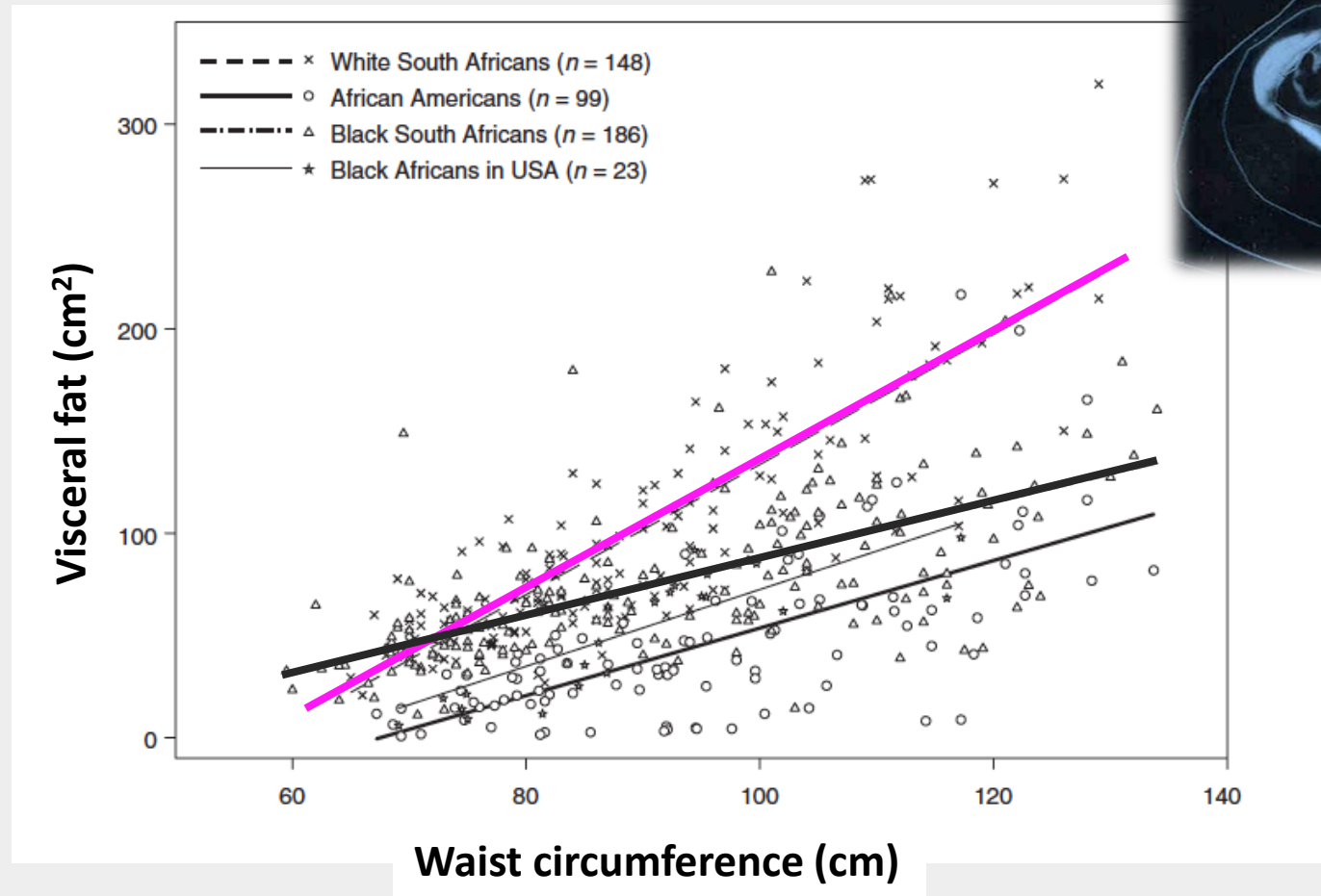
White
BMI = 37.1 kg/m²
WHR = 1.00



Black
BMI = 37.6 kg/m²
WHR = 0.84



ETHNIC-SPECIFIC BODY FAT DISTRIBUTION



Body mass index cut-points to identify cardiometabolic risk in black South Africans

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ORIGINAL ARTICLE

Deriving an optimal threshold of waist circumference for detecting cardiometabolic risk in sub-Saharan Africa

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OPEN ACCESS Freely available online

The Current Waist Circumference Cut Point Used for the Diagnosis of Metabolic Syndrome in Sub-Saharan African Women Is Not Appropriate

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The Prevalence of Metabolic Syndrome and Determination of the Optimal Waist Circumference Cutoff Points in a Rural South African Community

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joint interim statement (JIS) by several organizations in an attempt to harmonize the definition of metabolic syndrome (5). The available information based on ATPIII and IDF criteria suggests that metabolic syndrome is pandemic but that prevalence varies widely depending on the ethnic groups studied and criteria applied (9). Sub-Saharan Africa currently is experiencing one of the most rapid demographic and epidemiological transitions with one of the fastest rates of urbanization, which is thought to be mainly responsible for the rising burden of diabetes and other noncommunicable diseases (10–13). The available information on the prevalence of metabolic syndrome in epidemiology studies in sub-Saharan Africa is limited to reports on West Africans in Cameroon (14), Benin (15), and Nigeria (16) and based on ATPIII (2–4) or IDF definitions (1). The crude prevalence in these studies ranged from an absence or low prevalence (0–4.1%) in rural communities in all three countries as well as in an urban community in Cameroon. In Benin, prevalence was higher in semiurban

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ORIGINAL ARTICLE

Ethnic-specific cut-points for sarcopenia: evidence from black South African women

HS Kruger¹, LK Micklesfield², HH Wright^{1,3}, L Havemann-Nel¹ and JH Goedecke^{4,5}



Appendicular skeletal mass (ASM, kg)
= sum of arms and legs FFSTM

Appendicular skeletal mass index (ASMI, kg/m²)
= $\frac{ASM}{height^2}$

$ASM_{BMI} = ASM$ divided by BMI

For this study:

Sarcopenia cut-point was calculated as the ASMI two SD below the mean for each reference group

The residual method (RM) Newman et al., 2003

Results

Table 1. Comparison of age and body composition data of black South African groups and international reference data

	<i>Black, Soweto</i>	<i>Black, Cape Town</i>	<i>Rosetta study</i> ²	<i>Brazilian women</i> ³
<i>n</i>	371	238	122	349
Age (years)	35.1 (3.2) ^a	25.8 (5.9) ^b	29.7 (5.9) ^c	29 (7.5) ^c
Height (m)	1.59 (0.06) ^a	1.60 (0.06) ^b	1.64 (0.07) ^c	1.60 (0.06) ^b
Weight (kg)	72.5 (15.8) ^a	76.2 (21.0) ^a	65.0 (15.2) ^b	59.8 (11.9) ^b
Body mass index (kg/m ²)	28.8 (6.2) ^a	29.8 (8.0) ^a	24.1 (5.4) ^b	23.5 (4.5) ^b
Body fat (%)	38.1 (7.1) ^a	38.5 (9.1) ^a	26.4 (6.1) ^b	32.7 (8.2) ^c
Appendicular skeletal muscle mass (kg)	18.4 (3.1) ^{a,b}	19.0 (3.4) ^b	17.7 (3.7) ^a	16.8 (2.5) ^c
Appendicular skeletal muscle mass index (kg/m ²)	7.29 (1.17) ^a	7.41 (1.24) ^a	7.3 (0.9) ^a	6.60 (0.8) ^b
Cut-point	4.95	4.93	5.5	5.0 ^d

^{a,b,c}Different superscripts indicate significant differences in age and body composition variables of black SA groups and international reference data ($P < 0.05$).
^dCalculated from data in table. Values are mean (s.d.).

Mean sarcopenia cut point for the two SA groups was 4.94 kg/m²

5 methods to calculate the proportion of sarcopenic women in an **older (45-64 years) sample of black SA women (n=221)**

Foundation for the National Institutes of Health	FNIH ASM _{BMI}	ASM _{BMI} < 0.512
Foundation for the National Institutes of Health	FNIH ASM	< 15.02 kg
European Working Group on Sarcopenia in Older People	EWGSOP ASMI	< 5.5 kg/m ²
Residual method (Newman et al., 2003)	RM	ASM adjusting for height and FM
SA cut-points	SA ASMI	< 4.94 kg/m ²

Results – OLDER WOMEN (45-84 years of age)

The performance of different sarcopenia cut-points to predict low gait speed and handgrip strength among older black SA women

Cut-point	n (%)	Sensitivity (%)	Specificity (%)	OR (95% CI)
SA ASMI	20 (9.1)			
Gait speed < 0.8 m/s	4 (30.8)	30.8	95.5	5.30 (1.47, 19.2)
Handgrip < 16 kg	9 (19.1)	19.1	93.1	3.22 (1.26, 8.18)
EWGSOP ASMI	37 (16.7) ^a			
Gait speed < 0.8 m/s	4 (30.8)	30.8	95.1	2.34 (0.68, 8.06)
Handgrip < 16 kg	12 (25.5)	25.5	85.1	1.96 (0.90, 4.27)
RM	46 (20.8)			
Gait speed < 0.8 m/s	3 (23.1)	23.1	94.2	1.14 (0.30, 4.34)
Handgrip < 16 kg	11 (23.4)	23.4	79.4	1.18 (0.55, 2.54)
FNIH ASM_{BMI}	47 (21.4)			
Gait speed < 0.8 m/s	4 (30.8)	30.8	94.8	1.70 (0.50, 5.77)
Handgrip < 16 kg	13 (27.7)	27.7	81.1	1.64 (0.78, 3.46)
FNIH ASM	86 (38.7)			
Gait speed < 0.8 m/s	11 (84.6)	84.6	98.6	9.68 (2.09, 44.8)
Handgrip < 16 kg	28 (59.6)	59.6	66.9	2.97 (1.53, 5.76)

Results – OLDER WOMEN (45-84 years of age)

OR's to predict low gait speed and handgrip strength
(**SA cut point** and FNIH ASM cut point)

<i>Final model (only significant variables)</i>	Gait speed <0.8m/s		Handgrip strength < 16kg	
Constant	0.00		0.04	
Age (years)	1.15	1.06–1.25		
Sarcopenia (ASMI < / ≥ 4.94 kg/m ²)	9.82	2.11–44.6	3.71	1.42–9.64
HIV status (0 = no, 1 = yes)	6.83	0.94–49.4		
Hosmer and Lemeshow test	$\chi^2 = 6.57, df = 8, P = 0.58$		$\chi^2 = 4.24, df = 8, P = 0.83$	

Results – OLDER WOMEN (45-84 years of age)

OR's to predict low gait speed and handgrip strength
(SA cut point and **FNIH ASM** cut point)

<i>Final model (only significant variables)</i>	Gait speed <0.8m/s		Handgrip strength < 16kg	
Constant	0.0		0.13	
Age (years)	1.10	1.02–1.17		
Sarcopenia (ASM < / ≥ 15.02 kg)	8.71	1.76–43.1	3.42	1.69–6.95
Osteo-arthritis (0 = no, 1 = yes)			2.55	0.91–7.12
<i>Level of school education</i>				
≤ 7 years	reference			
> 7 years	0.22	0.03–1.84		
Hosmer and Lemeshow test	$\chi^2 = 4.89, df = 8, P = 0.77$		$\chi^2 = 0.27, df = 8, P = 0.87$	

Conclusions

- Wide variation in sarcopenia prevalence when different cut-points were used.
- SA reference group had high BF% and BMI, therefore lower cut-points and lower % (9.1% vs >16.7%)
- Methods adjusting for BMI and FM identified higher prevalence, but were not better predictors of functional ability
- SA cut point has similar or better predictive value than other international cut-points in predicting low functional ability in older SA women (FNIH ASM cut point greatest specificity and sensitivity).
- Further research in African populations is necessary to confirm the appropriateness of these cut-points.

Physical Activity Energy Expenditure and Sarcopenia in Black South African Urban Women

Herculina S. Kruger, Lize Haveman-Nijssen, Annette M. van der Vyse, Sarah J. Moss, and Michael Tieland

Background: Black women are both biologically and socially predisposed to age-related sarcopenia. The objective of this study was to investigate lifestyle factors associated with sarcopenia among Black South African (SA) urban women. **Methods:** In a cross-sectional study, 247 women (mean age 57 y) were assessed for anthropometric and sociodemographic variables, dietary intakes, and physical activity were measured. Activity energy expenditure was measured using combined accelerometry/heart rate monitoring (ActiHeart), and HIV status was tested. Dual energy x-ray absorptiometry was used to measure appendicular skeletal mass (ASM). Sarcopenia was defined according to a recently derived SA cutpoint (ASM index < 4.94 kg/m²). **Results:** In total, 8.9% of the women were sarcopenic, decreasing to 8.1% after exclusion of participants who were HIV positive. In multiple regressions with ASM index, grip strength, and gait speed, respectively, as dependent variables, only activity energy expenditure ($\beta = .27$) was significantly associated with ASM index. Age ($\beta = -.50$) and activity energy expenditure ($\beta = .17$) were significantly associated with gait speed. Age ($\beta = -.11$) and lean mass ($\beta = .21$) were significantly associated with handgrip strength. **Conclusions:** Sarcopenia was prevalent among these SA women and was associated with low physical activity energy expenditure.

Keywords: aging, body composition

Sarcopenia was prevalent (8.1%) and was associated with low physical activity EE.



Thank you