

**Caloric intake, diet quality and
physical activity in explaining the
differences in the prevalence of
Metabolic Syndrome between
Brazilian and Japanese community-
dwelling elderly people**

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Introduction

- Met.S has been reported to affect about 31.3% of Brazilians (Pousada JM, 2005) but just 5.3% of Japanese (Urashima M, 2005).
- The Japanese population has one of the healthiest diets in the world while possessing the lowest prevalence of obesity and Met.S in the developed world (Urashima M, 2005).
- In turn, the Southern Brazilian region of the Pampas has one of the highest prevalences of obesity, Met.S and high meat intake in the world (Roriz-Cruz M, 2007).

Objective

- To evaluate how much caloric intake, diet quality, physical activity and metabolic rate might explain the different prevalences of Met.S between community-dwelling Brazilian and Japanese elderly people.

Methods

- We evaluated 422 community-dwelling elderly in Brazil and 410 in Japan using the same protocol.
- Diet – Japanese-Brazilian Diet Frequency Questionnaire (Cardoso MA, 2001) .
- Energy expenditure – Stanford Questionnaire (Stewart AL, 2001).
- Nutrient calculation of the diets were performed using the Dietsys[®] 4.0 software (Block G, 1994).
- Met.S was diagnosed according to the ATP-III and WHOcriteria.
- Reported values were adjusted for age and gender, and had a $P < 0.05$.

Results

Table 1. Baseline characteristics, prevalence of metabolic syndrome (Met.S) and its individual components, functional dependence, and depression in Brazil and Japan.

Country	Brazil	Japan	P *
Invited number	450	450	----
Final sample	422 (93.8)	410 (91.1)	0.883
Baseline characteristics			
Mean Age \pm SD	68.5 \pm 6.2	69.1 \pm 6.3	0.421
Female (%)	267 (63.3)	262 (63.7)	0.493
Height (cm)	159.9 \pm 9.4	154.2 \pm 8.6	0.001
Weight (kg)	71.3 \pm 13.8	53.8 \pm 8.7	< 0 .001
Body Mass Index (BMI) \pm SD	27.9 \pm 5.0	22.6 \pm 2.7	< 0 .001
Monthly household income \pm SD (I\$) [†]	682 \pm 488	1356 \pm 976	< 0.001
Education [§] (years) [†]	4.4 \pm 3.6	7.0 \pm 1.0	< 0.001

Health Education Indicator

Brazil

Japan

P *

% of aware hypertensives

215/367 (58.6)

157/247 (63.6)

0.134

Health Care Quality Indicators

Taking regular prescribed drugs (%)

375 (88.9)

184 (44.9)

< 0.001

Hypertensives taking anti-HT drug (%)

285 (67.5)

209 (51.0)

< 0.001

% Hypertensives controlled ^{||}

129/215 (45.3)

97/157 (46.4)

0.506

DM on treatment (%)

70/105 (66.7)

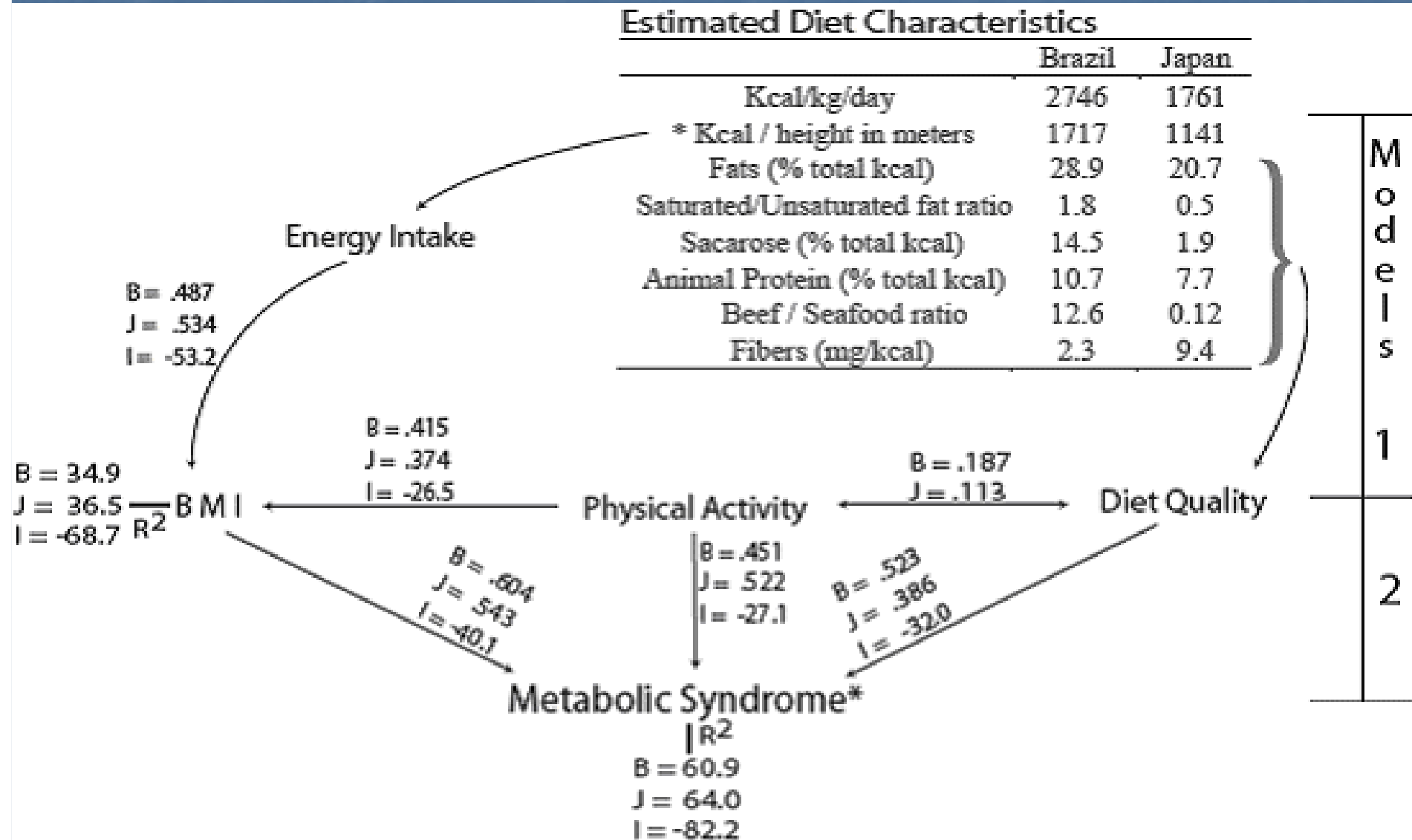
9/24 (37.5)

<0.001

Metabolic Syndrome components	Brazil	Japan	P
BMI \geq 30 kg/m ² (%)	127 (30.1)	2 (0.5)	< 0.001
BMI \geq 25 < 30 kg/m ² (%)	186 (44.1%)	66 (16.3)	< 0.001
Glucose \pm SD (mg/dl)	123.3 \pm 57	99.3 \pm 21	< 0.001
Diabetes Mellitus (%)	105 (24.9)	24 (5.9)	< 0.001
Impaired fasting glucose (%)	97 (23.0)	54 (13.2)	< 0.001
HDL-c \pm SD (mg/dl)	43.0 \pm 12	51.9 \pm 12.8	< 0.001
HDL-c \leq 40 M; \leq 50 F (%)	259 (61.4)	38 (9.3)	< 0.001
Triglycerides \pm SD (mg/dl)	138.5 \pm 40	100.7 \pm 27	< 0.001
Triglycerides \geq 150 mg/dl (%)	130 (30.8)	21 (5.1)	< 0.001
Systolic BP \pm SD	153.3 \pm 26	138.2 \pm 19	< 0.001
Diastolic BP \pm SD	86.4 \pm 14	77.9 \pm 11	< 0.001
Hypertension (140/90 mmHg)	367 (87.0)	247 (60.2)	< 0.001
Metabolic Syndrome ATP III (%)	166 (39.3)	30 (7.3%)	<0 .001
Metabolic Syndrome WHO (%)	152 (36.0)	25 (6.1%)	<0 .001
Mean Number of Met.S components	2.30	1.18	0.001

	Brazil	Japan	P *
Other Met.S-associated variables			
Ischemic heart disease (%)	119 (27.9)	67 (16.3)	0.007
Stroke (%)	40 (9.5)	16 (3.9)	0.001
Actively Working (%)	283 (67.1)	328 (80.0)	< 0.001
Regular exercise ††	136 (32.2)	183 (44.6)	< 0.001
Resting pulse rate (bpm)	74.0	66.7	<0 .001

Structural equation model: intra-countries beta standardized coefficients and intercountries explanatory variances (%) attributable to Met.S causes in Brazil and Japan.



B: Brazil; J: Japan; I: Intercountries. B and J: values represent standardized beta coefficients, except for double arrow lines, which represent correlation coefficients; I: values represent effect sizes in percentage of explained variance (analysis of covariance). BMI: Body Mass Index. Diet quality was adjusted for total kcal.

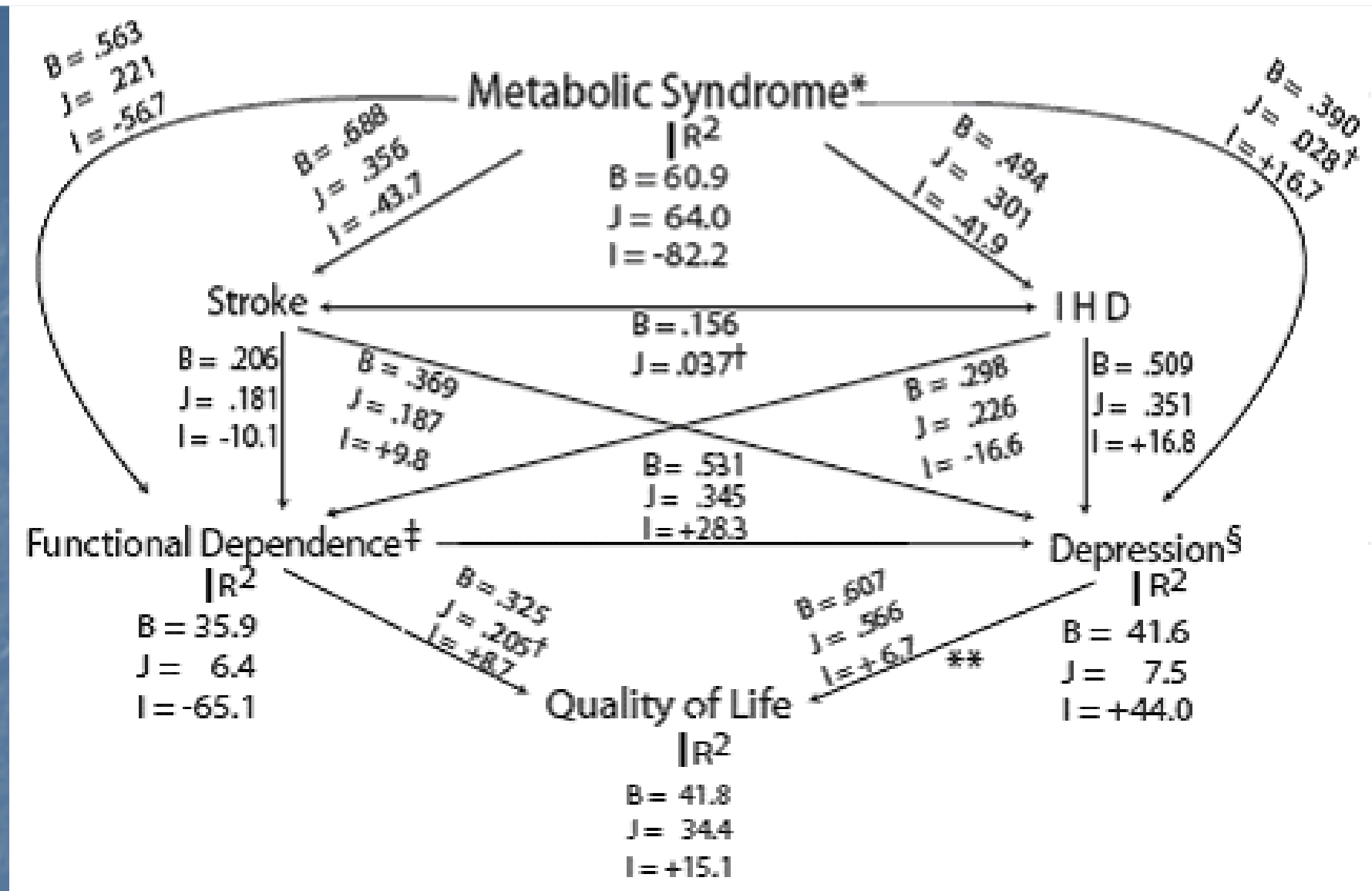
Table 2. Estimated daily energy balance for Brazilian and Japanese elderly

	Brazil	Japan
Caloric Intake (Kcal)	2746	1761
Caloric expenditure		
Thermic Effect of food (Kcal)	275	176
Physical activity (Kcal)	326	407
Basal Metabolism (Kcal)	2145	1178
Basal Metabolic Rate (Kcal/kg)	30.1	21.9
Energy spent as Physical Activity (%)	11.9	23.1
% Fat mass (kg) *	32.8 (23.4)	26.9 (14.5)
% Excess Body Fat: Brazil - Japan	5.9%	Reference
Adjusted Metabolic Rate (Kcal/kg)†	31.4	21.9

Estimated from ethnicity-specific formulae, according to age, gender, weight and height.⁸⁹ † Adjusted to mean excess percent of fat mass in Brazil, in relation to Japan (reference group); considering daily fat-free mass basal metabolic rate to be 25.78 kcal/Kg and that of fat mass to be 4.03 kcal/Kg.⁹⁰

Conclusions

- Significant differences were found in terms of caloric intake, basal metabolic rate, diet quality and physical activity between the two populations.
- Together, they explained 82.2% of the variance about the higher prevalence of Met.S in Brazil as compared to Japan.



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