Dietary patterns and multimorbidity in the ELSA-Brasil Cohort

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Background

Substantial evidence from observational studies and systematic reviews underscores the pivotal role of dietary patterns in preventing chronic diseases and mortality.

While existing literature has associated eating patterns with unfavorable health outcomes, such as cardiovascular disease, diabetes and cancer, there remains a gap in understanding the relationship between dietary patterns and multimorbidity.

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Objective

The study aims to investigate the relationship of dietary patterns with multimorbidity within the ELSA-Brasil cohort.

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Methods

- Brazilian Longitudinal Study of Adult Health (ELSA-Brasil) is a multicentric study of active employees or retirees from six institutions in Brazil, aged 35 to 74 years old.
- Data from the baseline (2008 – 2010).
- Multimorbidity was defined by the presence of two or more chronic morbidities selected from a group of 16 (Marques et al., J Multimorb Comorb. 2023).
- Food consumption was assessed through a 114-items and 24-subitems from Frequency Food Questionnaire (FFQ).

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Methods

- Latent Class Analysis (LCA) was used to delineate discernible dietary patterns, where each individual has a predicted probability of belonging to each class. The interpretation and nomenclature of the classes were based on the conditional probabilities of consumption of Prudent, Processed, and Mixed patterns.

- To examine the association between the three dietary patterns and MM we employed a generalized ordered logistic regression.

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Results

Table 1: Sociodemographic characteristics according to multimorbidity (ELSA-Brasil, n=13,229, 2008-2010)

	Multimorbidity			
	No	Yes	Total	p-value
Total	4,148	9,081	13,229	
Age (median IQR)	48 (43-55)	53 (47-60)	52 (45-59)	< 0.001
Energy intake total (kcal)	2426 (1925-3050)	2424 (1923.5-3050.7)	2422.7(1924.5-3048.3)	0.958
		n (%)		
Sex				< 0.001
Men	2211 (37.0)	3763 (63.0)	5974 (100)	
Women	1937 (26.7)	5318 (73.3)	7255 (100)	
Race				< 0.001
White	2357 (34.1)	4550 (65.9)	6907 (100)	
Brown	1109 (30.4)	2538 (69.6)	3647 (100)	
Black	485 (23.4)	1584 (76.6)	2069 (100)	
Marital Status				< 0.001
With partner	2892 (33.2)	5810 (66.8)	8702 (100)	
No partner	1256 (27.7)	3271 (72.3)	4527 (100)	
Schooling				< 0.001
Never/incomplete secondary school	373 (22.6)	1274 (77.4)	1647 (100)	
Complete secondary school	1277 (28.8)	3157 (71.2)	4434 (100)	
University degree	2498 (34.9)	4650 (65.1)	7148 (100)	
Monthly per capita family income				< 0.001
Low	1331 (28.4)	3352 (71.6)	4683 (100)	
Medium	1502 (32.9)	3063 (67.1)	4565 (100)	
High	1297 (33.0)	2636 (67.0)	3933 (100)	

Results

Prudent Pattern: higher probabilities of a traditional Brazilian diet characterized by white rice, beans, and low-fat milk.

Mixed Pattern: more likely to consume fruits, vegetables, yogurt, wine, nuts, sweet drinks and soft drinks.

Processed Pattern: elevated probabilities of consuming an increased amount of fast food, salty snacks, sweets, as well as fruits and vegetables.

Table 2: Lifestyle factors, according to multimorbidity (ELSA-Brasil, n=13,229, 2008-2010)

	Multimorbidity			
	No	Yes	Total	p-value
Smoking				< 0.001
Nonsmoker	2578 (34.0)	4998 (66.0)	7576 (100)	
Former smoker	1053 (26.6)	2912 (73.4)	3965 (100)	
Smoker	517 (30.6)	1170 (69.4)	1687 (100)	
Alcohol consumption				< 0.001
None	1961 (28.6)	4900 (71.4)	6861 (100)	
Moderate	1705 (35.3)	3126 (64.7)	4831 (100)	
Excessive	481 (31.4)	1052 (68.6)	1533 (100)	
Leisure physical activity				< 0.001
Light	2949 (29.5)	7035 (70.5)	9984 (100)	
Moderate	716 (33.4)	1425 (66.6)	2141 (100)	
Vigorous	415 (45.2)	504 (54.8)	919 (100)	
Central obesity				< 0.001
Without central obesity	3054 (42.3)	4165 (57.7)	7219 (100)	
With central obesity	1094 (18.2)	4913 (81.8)	6007 (100)	
Nutritional Status				< 0.001
Normal weight	2169 (44.6)	2693 (55.4)	4862 (100)	
Overweight	1810 (33.7)	3561 (66.3)	5371 (100)	
Obesity	169 (5.6)	2827 (94.4)	2996 (100)	
Diet Pattern				< 0.001
Prudent	1238 (29.8)	2923 (70.2)	4161 (100)	
Mixed	1486 (35.3)	2723 (64.7)	4209 (100)	
Processed	1482 (29.3)	3435 (70.7)	4859 (100)	

Results

Table 3: Multiple logistic regression of the relationship between latent class models dietary patterns and multimorbidity (ELSA-Brasil, n=13,229, 2008-2010)

Diet patterns	Multimorbidity			
	Model 1	Model 2	Model 3	Model 4
	OR (IC 95%)	OR (IC 95%)	OR (IC 95%)	OR (IC 95%)
Prudent	1.00	1.00	1.00	1.00
Mixed	0,77 (0,70-0,85)	0,91 (0.82-1.00)	0.79 (0.90-1.11)	0.98 (0.88-1.10)
Processed	1.02 (0.93-1,11)	0,91 (0.82-1.00)	**1.15 (1.02-1.28)**	**1.15 (1.02-1.30)**
AIC	16416	14875	14457	13076

AIC: Akaike Information Criterion.
Model 1: unadjusted.
Model 2 includes age, sex, race.
Model 3 includes model 2 + marital status, schooling, monthly per capita family income, smoking, alcohol consumption, physical activity.
Model 4 includes model 3 + total energy intake, central obesity.

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Conclusion

Our study reveals a noteworthy association between the Processed diet pattern and a 15% increase in the prevalence of multimorbidity. This result emphasizes the crucial role of dietary choices in shaping health outcomes.

There is a pressing need for public health policies and strategies to prioritize and promote the consumption of healthy foods. By encouraging improved eating patterns, we can contribute to the prevention and reduction of chronic diseases, fostering better overall health in the population.

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Thank you!