Latent Class Analysis to identify and describe dietary patterns of women in Ibadan, Nigeria

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Background

Latent class analysis is an attractive method to identify and characterize unmeasured ('latent') classes of women based on their dietary patterns[1]. Women within the same latent class are homogeneous regarding their food group intake patterns.
We used latent class analysis to identify dietary patterns among urban and peri-urban Nigerian women, and to assess the relationship between nutritional status and dietary patterns.

Results

Three distinct dietary patterns were identified, with prevalence values of 57%, 31% and 12% Table 1.

Table 1. Conditional probabilities of consuming each food group for three dietary patterns.

	Cluster1	s.e.	Cluster2	s.e.	Cluster3	s.e.
Cluster Size	0.5693	0.0443	0.3132	0.0394	0.1176	0.0292
Indicators						
Grainswhiterootsandtubers						
1	0.5094	0.0472	0.6289	0.0615	0.1162	0.0947
2	0.4906	0.0472	0.3731	0.0615	0.8838	0.0947
Pulsesbeanspeasandlentil						
0	0.3588	0.0451	0.2942	0.0566	0.1752	0.1077
1	0.4020	0.0461	0.3643	0.0596	0.0070	0.0207
2	0.2392	0.0421	0.3415	0.0591	0.8178	0.1085
Nutsandseed						
0	0.4933	0.0476	0.7125	0.0565	0.1563	0.0989
1	0.2586	0.0413	0.1095	0.0397	0.5067	0.1164
2	0.2481	0.0406	0.1780	0.0474	0.3369	0.1088
Dairyandproducts						
0	0.8761	0.0328	0.7444	0.0544	0.5723	0.1134
1	0.0652	0.0238	0.1817	0.0481	0.0738	0.0564
2	0.0588	0.0250	0.0739	0.0322	0.3539	0.1091
Meatpoultryandfish						
0	0.0002	0.0016	0.2021	0.0507	0.0681	0.0554
1	0.5169	0.0479	0.5358	0.0622	0.0191	0.0485
2	0.4829	0.0479	0.2621	0.0575	0.9128	0.0705
Eggs						
0	0.5761	0.0460	0.5541	0.0619	0.5191	0.1159
1	0.1777	0.0360	0.2675	0.0552	0.2879	0.1013
2	0.2462	0.0396	0.1784	0.0490	0.1930	0.0886
Darkgreenleafyvegetables						
0	0.0089	0.0272	0.9369	0.0584	0.1576	0.0835
1	0.5348	0.0507	0.0123	0.0362	0.3013	0.1075
2	0.4563	0.0499	0.0508	0.0458	0.5411	0.1180
OthervitaminArichfruitsandvegs						
0	0.6716	0.0438	0.6887	0.0573	0.6472	0.1096
1	0.1644	0.0348	0.1492	0.0442	0.2115	0.0950
2	0.1640	0.0348	0.1621	0.0456	0.1412	0.0828
Othervegetables						
0	0.0000	0.0003	0.0142	0.0141	0.0001	0.0014
1	0.4624	0.0481	0.7518	0.0558	0.0114	0.0278
2	0.5376	0.0481	0.2340	0.0550	0.9886	0.0278
Otherfruits						
0	0.8828	0.0298	0.7970	0.0498	0.7412	0.0958
1	0.0678	0.0231	0.1327	0.0417	0.0016	0.0102
2	0.0494	0.0204	0.0702	0.0325	0.2571	0.0955

Method

Dietary intakes data were collected with a survey (2019) from 225 women 18-49y; *Fruit and Vegetable in Vietnam and Nigeria* project[2].

- Quantitative multi-pass 24hour Recalls[3]
- Socio-demographic characteristics
- Anthropometric measurements

Food intakes were grouped into 10 Minimum Dietary Diversity food groups[4]: consumptions <15grams were categorized as negligible (0); ≥15grams dichotomized by median split as low (1) and high (2).
Latent Class Analysis was used to identify dietary patterns, and logistic regression to assess their relationship with underweight and overweight/obesity.

Dietary pattern one was characterized by consumption of grains and tubers, animal source foods and other vegetables. Women in dietary pattern two were more likely to consume low or negligible quantities of all food groups. Dietary pattern three represented the most diversified diet, high consumption of grains and tubers, pulses and animal source foods.

Table 2. Background characteristics of the studied population by dietary patterns and association between nutritional status and dietary patterns.

	n	Dietary Pattern			
		1	2	3	
Cluster size, n(%)		**130** *(58)*	**68** *(30.4)*	**26** *(11.6)*	
		Mean (SD) [a]			p [b]
Age, years	221	34.4 (8.2)	35.6 (8.6)	35.0 (7.7)	
BMI	219	24.8.1 (6.9)	25.9 (5.6)	23.5 (4.7)	0.41
		% [c]			p [b]
Nutritional Status	219				
Underweight	14	5.5	9.2	3.8	0.76
Normal	114	58.3	47.7	42.3	0.63
Overweight/ Obese	90	38.3	43.0	53.9	0.71

a Mean age/BMI given the dietary pattern; b Correlation between dietary patterns and BMI; and nutritional status class; c Probability of belonging to nutritional status category given the dietary pattern

No evidence of association was found between dietary patterns and nutritional status (Table 2). The odds of being underweight were reduced by 11.2% in dietary pattern one, increased by 51% in dietary pattern two, and decreased by 38% in dietary pattern three; of being obese reduced by 14% in dietary pattern one, increased by 17% in dietary pattern two and 35% in dietary pattern three.

Conclusion

The application of latent class analysis can contribute to the identification of groups with specific consumption patterns and needs to inform appropriate and tailored interventions.

References

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FVN Fruits and Vegetables intake Vietnam and Nigeria