

NUTRIENT DIETARY PATTERNS AND THE RISK OF LARYNGEAL CANCER: AN ITALIAN CASE-CONTROL STUDY

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Dietary patterns



Traditional approach

- **single** foods/nutrients
- several regression models applied on **each food/nutrient**

Dietary patterns approach

- **combinations** of dietary components to summarize total diet, or key aspects of the diet, for a given population
- individuals arrayed on their scores for the identified patterns
- overall regression model including all the patterns scores simultaneously

Study design

Hospital based case-control study
from 1992 to 2000

centers: Milan, Pordenone



460 laryngeal cancer
cases

90 supraglottis

248 glottis

122 other/unspecified site

1088 controls

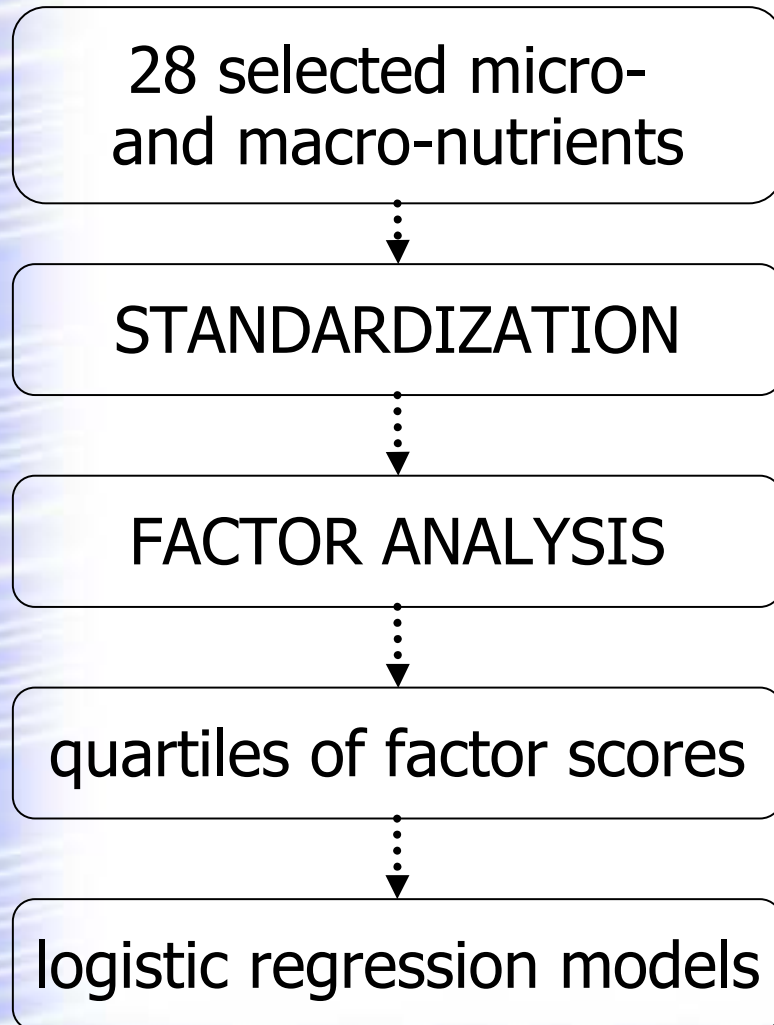
structured questionnaire

78 foods and recipes

food composition database

90 nutrients

Statistical analyses



METHOD:
principal component

ROTATION:
varimax

FACTORS RETAINED:
5

- eigenvalue > 1
- scree plot
- interpretability

inspection of
correlation matrix

- $\text{corr} < 0.30$ or $\text{corr} \geq 0.80$
- Bartlett's test of sphericity

measures of
sampling adequacy

- overall measure (KMO statistic)
- individual measures

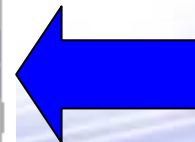
Cronbach's
coefficients alpha

- for each factor (nut with loading ≥ 0.40)
- alpha *when item deleted*

Results: factor loadings

Tab. 1 – Factor loadings matrix* and explained variances for the 5 dietary patterns identified					
Nutrient	Animal products	Starch-rich	Vitamins and fiber	Vegetable unsaturated fats	Animal unsaturated fats
Animal protein	0.76	0.25	-	0.26	0.43
Vegetable protein	0.31	0.82	0.32	0.20	0.12
Cholesterol	0.67	0.28	-	0.25	0.43
Saturated fatty acids	0.75	0.23	0.12	0.42	0.18
Monounsaturated fatty acids	0.29	0.20	0.26	0.59	0.22
Linoleic acids	0.18	0.19	-	0.84	0.12
Linolenic acids	0.31	0.16	-	0.80	0.12
Other polyunsaturated fatty acids	0.18	0.22	0.10	0.18	0.90
Soluble carbohydrates	0.50	0.21	0.56	-	-
Starch	0.31	0.86	0.11	0.15	-
Sodium	0.60	0.65	-	0.15	0.12
Calcium	0.89	-	0.18	0.12	-
Potassium	0.52	0.41	0.55	0.24	0.25
Phosphorus	0.82	0.36	0.17	0.23	0.23
Iron	0.45	0.42	0.23	0.28	0.35
Zinc	0.69	0.48	0.15	0.27	0.33
Thiamin (vitamin B1)	0.57	0.46	0.46	0.22	0.26
Riboflavin (vitamin B2)	0.82	0.12	0.36	0.15	0.21
Vitamin B6	0.53	0.42	0.49	0.27	0.36
Total folate	0.46	0.32	0.65	0.23	0.22
Niacin	0.37	0.47	0.30	0.29	0.59
Vitamin C	0.13	-	0.87	-	-
Retinol	0.38	-0.15	0.16	-	0.40
Beta-carotene equivalents	-	-	0.69	0.31	-
Lycopene	-	0.55	0.19	0.25	0.18
Vitamin D	0.19	0.16	0.11	0.15	0.86
Vitamin E	0.14	0.20	0.39	0.82	0.17
Total fiber	0.19	0.39	0.79	0.15	-
Variance explained (%)	24.75	14.97	14.87	12.69	11.72
Cumulative variance explained (%)	24.75	39.72	54.59	67.28	79.00

*Loadings greater or equal to 0.63 were defined as dominant nutrients for each factor, and were shown in bold typeface; loadings smaller than 0.1 were suppressed.



Results: odds ratios

Tab. 2 – Odds ratios and confidence intervals on quartiles of factor scores

Dietary pattern	Quartiles category, OR (95% CI)			
	I*	II	III	IV
Animal products	1	1.09 (0.72-1.66)	1.59 (1.06-2.36)	2.34 (1.59-3.45)
Starch-rich	1	0.93 (0.62-1.39)	1.46 (1.00-2.15)	1.43 (0.97-2.10)
Vitamins and fiber	1	0.62 (0.44-0.86)	0.47 (0.32-0.67)	0.35 (0.24-0.52)
Vegetable unsaturated fats	1	1.23 (0.85-1.78)	1.09 (0.74-1.59)	0.83 (0.57-1.22)
Animal unsaturated fats	1	1.44 (0.97-2.14)	1.49 (1.00-2.21)	2.07 (1.42-3.01)

*reference category. Estimates from a multiple logistic regression model adjusted for age, sex, study center, education, body mass index, occupational physical activity, tobacco smoking and alcohol drinking. Results refer to the composite model including all the five factors simultaneously.

Conclusions

- Factor analysis allowed to identify 5 dietary patterns, explaining about 80% of the total variance of the original nutrients
- The *Animal products* and the *Animal unsaturated fats* patterns are potentially unfavourable indicators of risk for laryngeal cancer
- The *Vitamins and fiber* pattern is associated with a reduced risk of laryngeal cancer

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