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Cultural differences in diet and determinants of diet quality in Switzerland: results from the National Nutrition Survey menuCH

Giulia Pestoni[1], Jean-Philippe Krieger[1], Janice Marie Sych[2], David Faeh[1,3], Sabine Rohrmann[1]

[1]Epidemiology, Biostatistics and Prevention Institute, University of Zurich, Zurich, Switzerland; [2]ZHAW Zurich University of Applied Sciences, Wädenswil, Switzerland; [3]BFH Bern University of Applied Sciences, Bern, Switzerland

Introduction

- Sociodemographic and lifestyle differences in diet were observed in different populations; they are crucial to be evaluated at the national level in order to improve and better target dietary recommendations.
- Cultural differences were found to be important determinants of diet quality.
- Switzerland consists of three language regions, but common national health policies and provides an optimal setting to investigate cultural differences.
- Previous Swiss results relied on undetailed dietary data or were based on data from single cities or regions.
- The Swiss National Nutrition Survey menuCH was conducted in 2014-2015 in order to assess the food consumption in a Swiss representative sample.
- **Our analysis aimed to identify sociodemographic and lifestyle determinants of diet quality and to investigate the differences in diet quality between language regions of Switzerland.**

Methods

- Participants: 2,057 men and women, aged 18-75.
- Dietary assessment: two 24-hour dietary recalls, software GloboDiet®.
- Diet quality: assessed with diet quality scores (high score = high diet quality)
  - Alternate Healthy Eating Index (AHEI).
  - Mediterranean Diet Score (MDS).
- Sociodemographic and lifestyle variables: obtained from a dietary behaviour and lifestyle questionnaire.
- Weighting: results weighted for sex, age, marital status, major area, nationality, household size; food data further weighted for season, weekday.
- Statistical analysis:
  - Sociodemographic and lifestyle determinants of diet quality were investigated using multiple linear regression models.
  - Differences between language regions for single components of diet quality scores were investigated using chi-square tests.

Results

- Characteristics of the participants:
  - 50.2% females
  - 54.1% normal weight
  - 52.6% with tertiary education
  - 42.9% never smokers

Table 1: Association between diet quality scores and sociodemographic factors (n=2,057)[a,b,c]

	AHEI (0 - 110 points)		MDS (0 - 9 points)	
	Coefficient	95% CI	Coefficient	95% CI
Sex				
Males	0		0	
Females	**1.57**	**[0.38 ; 2.76]**	-0.12	[-0.23 ; 0.00]
Age group				
18 - 29 years	-1.33	[-3.09 ; 0.43]	-0.09	[-0.27 ; 0.08]
30 - 44 years	0		0	
45 - 59 years	**2.98**	**[1.62 ; 4.33]**	**0.21**	**[0.08 ; 0.35]**
60 - 75 years	**4.77**	**[3.09 ; 6.45]**	**0.34**	**[0.17 ; 0.50]**
Language region				
German-speaking	0		0	
French-speaking	**2.01**	**[0.81 ; 3.22]**	**0.20**	**[0.09 ; 0.32]**
Italian-speaking	1.98	[-0.27 ; 4.23]	**0.31**	**[0.09 ; 0.53]**
BMI categories				
Underweight	2.10	[-1.24 ; 5.44]	**0.37**	**[0.04 ; 0.70]**
Normal weight	0		0	
Overweight	**-2.53**	**[-3.74 ; -1.32]**	**-0.27**	**[-0.39 ; -0.15]**
Obese	**-4.53**	**[-6.21 ; -2.86]**	**-0.33**	**[-0.49 ; -0.16]**
Nationality				
Swiss only	0		0	
Swiss binational	1.08	[-0.45 ; 2.61]	0.09	[-0.06 ; 0.24]
Non-Swiss	**2.03**	**[0.74 ; 3.33]**	**0.21**	**[0.08 ; 0.34]**
Education, highest degree				
Primary/no degree	-1.26	[-3.78 ; 1.25]	-0.09	[-0.33 ; 0.16]
Secondary	0		0	
Tertiary	**2.44**	**[1.32 ; 3.56]**	**0.16**	**[0.05 ; 0.26]**
Self-reported physical activity				
Low	0		0	
Moderate	**2.82**	**[1.05 ; 4.60]**	**0.29**	**[0.12 ; 0.45]**
High	**1.82**	**[0.24 ; 3.41]**	**0.23**	**[0.07 ; 0.38]**
Smoking status				
Never	0		0	
Former	-1.13	[-2.31 ; 0.05]	**0.12**	**[0.00 ; 0.23]**
Current	**-3.35**	**[-4.70 ; -2.00]**	-0.04	[-0.17 ; 0.09]

[a]Coefficients and 95% CI derived from linear regression models; bolded values represent statistically significant results (p-value<0.05); multiple imputation with chained equations used to deal with missing values
[b]Coefficients equal to 0 represent the reference category
[c]Results were mutually adjusted for all the variables in this table, for mean energy intake, season and weekday
BMI: Body mass index, CI: Confidence interval

Table 2a: Weighted proportions of participants in the highest tertile of each Alternate Healthy Eating Index (AHEI) component and differences between language regions (n=2,057)[a]

Alternate Healthy Eating Index (AHEI)	German-speaking region T3 (%)	French-speaking region T3 (%)	Italian-speaking region T3 (%)	Overall p-value[b]	German vs. French p-value[b]	French vs. Italian p-value[b]	German vs. Italian p-value[b]
Vegetables	32.8	34.1	36.7	0.49	1	0.44	0.36
Fruit	33.1	31.6	32.3	0.72	1	1	1
Whole grains	23.8	19.7	16.3	**<0.01**	0.50	**0.03**	**<0.01**
Sugar-sweetened beverages/fruit juices[c]	31.3	34.9	51.0	**<0.01**	1	**0.01**	**<0.01**
Nuts and legumes	34.1	31.4	32.5	0.07	0.56	0.71	0.05
Red/processed meat[c]	32.2	35.7	35.7	0.39	1	1	0.75
Trans fat[c]	83.2	91.8	95.0	**<0.01**	**<0.01**	0.97	**<0.01**
Fish	4.9	6.6	9.7	**<0.01**	**<0.01**	1	**0.01**
PUFA	33.5	34.1	27.0	0.18	0.55	0.50	0.86
Sodium[c]	30.9	38.4	40.5	**0.03**	0.11	1	0.16
Alcohol[c]	34.7	27.0	42.8	**<0.01**	**0.02**	**<0.01**	0.08

[a]AHEI components divided into tertiles; the proportion of participants in the highest tertile (i.e. best fulfilling the criteria for recommended intake) is represented for each language region
[b]p-values derived from chi-square tests; bolded values represent statistically significant results (p-value<0.05)
[c]For sugar-sweetened beverages/fruit juices, red/processed meat, *trans* fat and sodium, a high score corresponds to low consumption; for alcohol, a high score corresponds to moderate consumption
PUFA: polyunsaturated fatty acids; T3: third tertile

Table 2b: Weighted proportions of participants with 1 point in each Mediterranean Diet Score (MDS) component and differences between language regions (n=2,057)[a]

Mediterranean Diet Score (MDS)	German-speaking region 1 point (%)	French-speaking region 1 point (%)	Italian-speaking region 1 point (%)	Overall p-value[b]	German vs. French p-value[b]	French vs. Italian p-value[b]	German vs. Italian p-value[b]
Vegetables	27.6	30.0	30.1	0.60	1	1	1
Legumes	1.1	0.5	1.5	0.76	1	1	1
Fruits and nuts	32.8	32.9	29.6	0.42	1	0.25	0.50
Cereals	32.4	28.8	24.6	0.31	1	1	0.44
Fish	5.1	6.6	9.7	**< 0.01**	**< 0.01**	1	**0.01**
Meat[c]	30.2	26.6	27.0	0.50	1	1	1
Dairy products[c]	30.0	43.0	40.4	**< 0.01**	**< 0.01**	1	**0.03**
Alcohol[c]	12.3	10.5	20.8	**0.05**	0.98	**0.01**	0.05
Fat intake	28.0	31.4	44.2	**< 0.01**	1	**0.01**	**< 0.01**

[a]The proportions of participants with 1 point (i.e. best fulfilling the criteria for recommended intake) are represented for each language region
[b]p-values derived from chi-square tests; bolded values represent statistically significant results (p-value<0.05)
[c]For the components meat and dairy products, a high score corresponds to low consumption; for the component alcohol, a high score corresponds to moderate consumption

Conclusion

- Significant differences in diet quality were observed across language regions, with participants living in the French- and Italian-speaking regions scoring higher than those living in the German-speaking region.
- Significant differences across language regions were mediated by the components whole grains, sugar-sweetened beverages, fat, fish, alcohol, dairy products.
- These new results might help to explain regional differences observed in morbidity and mortality of chronic diseases and to better characterise population groups that require specific dietary recommendations, enabling Swiss public health authorities to develop more targeted interventions.

giulia.pestoni@uzh.ch