Table 1. Bivariate logistic regression model showing adjusted associations between being involved with cooking and health & social determinants

Variables	Odds Ratio (e^{β})	%95 CI for Odds Ratio	p-value
Model 1			
Intercept	0.429	(0.258, 0.713)	**0.001**
Wealth Index (Ref. category: Very rich)			
Very poor	2.236	(1.666, 3.001)	**<0.0001**
Poor	2.057	(1.531, 2.764)	**<0.0001**
Normal	1.619	(1.227, 2.137)	**0.001**
Rich	1.424	(1.070, 1.896)	**0.016**
Education level (Ref. category: High school and higher)			
No education/Primary incomplete	0.674	(0.457, 0.993)	**0.046**
First level primary	1.394	(1.041, 1.868)	**0.026**
Second level primary	0.708	(0.567, 0.883)	**0.002**
Physical activity (Ref category: No physical activity)			
Regular	1.154	(0.881, 1.512)	0.296
Irregular	1.119	(0.929, 1.348)	0.235
Marital status (Ref category: Married)			
Single	0.040	(0.032, 0.05)	**<0.0001**
Alcohol Consumption (Ref category: No alcohol consumption)			
Regular consumption	0.319	(0.07, 1.454)	0.139
Irregular consumption	0.769	(0.504, 1.173)	0.222
Smoking (Ref category: No smoking)			
Regular smoking	1.692	(1.270, 2.254)	**<0.0001**
Irregular smoking	1.166	(0.771, 1.763)	0.467
Age (in years)	1.091	(1.075, 1.108)	**<0.0001**
Parity (number of total children ever born)	0.855	(0.778, 0.940)	**0.001**
BMI (weight(kg)/(height(m))²)	1.021	(1.004, 1.039)	**0.016**
Nagelkerke R^2=0.641; p<0.001, Classification Ratio: 89.3%			

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Evaluation of Dietary Intake in Acutely Ill Geriatric Patients in a District Hospital in Northern Germany

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Background/Aims: Geriatric patients are often unable to meet their energy requirements during hospital stays, which might contribute to high prevalence of malnutrition seen in this group [1]. Up to two thirds of older patients in acute care and rehabilitation hospitals are at nutritional risk or malnourished [2]. Moreover, own previous investigations in acutely ill geriatric patients show reduced protein and energy intakes even in well-nourished geriatric patients [3].

Therefore, the present study aimed at re-evaluating the extent to which recommended dietary intakes of macro- and micronutrients cannot be met by acutely ill geriatric patients during hospital stay.

Methods: This cross-sectional study was conducted once weekly totaling six complete days from 8th October to 16th November 2018 on a geriatric ward in a district hospital in Northern Germany. Detailed weighed food records were performed on one day during hospital stay in 24 mostly well-nourished geriatric patients (15 (63%) female, 82±6.2 years, BMI 29.8±8.1 kg/m², 18/24 NRS-2002<3). Nutrient intake was calculated using PRODI® 6 compact (Nutri-Science GmbH, Freiburg, Germany). Energy requirements were calculated using BASAROTs, PAL of 1.3 and stress factors. Protein requirements were set on 1.2 g/kgBW/d. An adapted body weight was used for obese patients (n=10). Body composition was determined via bioelectrical impedance analysis using seca mBCA 525 (seca gmbh & co. kg., Hamburg, Germany). Diet quality was measured using the EPIC Healthy-Eating-Index. NutritionDay-like questionnaires were used to collect information on anthropometric data, medical data as well as eating behavior in general and at day of investigation.

Results: Contrary to expectations, 63% (n=15) of the patients met their recommended energy intake, calculated with 10% tolerance to total energy requirements. Mean caloric-deficit among patients not covering their energy requirement was 519±267 kcal/d (n=9). Nevertheless, 92% (n=22) did not achieve the recommended protein requirements for geriatric nutrition. Mean deficits were 0.4±0.2g/kgBW/d or 31.8±16.3g/d respectively. Intake of carbohydrates was significantly reduced and accordingly, intake of fat was significantly increased (see table 1). This led to a macronutrient distribution of 13% protein, 45% fat and 42% carbohydrates. Fibre intake was significantly reduced as well as fluid intake. Intake of iodine, iron, folic acid and calcium were low and did not comply with ESPEN guideline on clinical nutrition and hydration in geriatrics (see table 1). Overall, 38% (n=9) described an unintentional weight loss during the last three months. Even though 79% (n=19) were satisfied with hospital catering, 71% (n=17) did not finish the meal off. Although 63% (n=15) were interrupted while eating, patients did not perceive it as reason for leftovers. Instead 65% (n=11) of participants with leftover food (n=17) stated too high volume of the meals. Only 12% (n=2) each reported lower appetite than usual or not tasting food as reason and 6% (n=1) each indicated chewing and swallowing problems or 'did not feel well'. However, on the day of investigation only 13% (n=3) had medical conditions associated with food intake and only 25% (n=6) felt to eat less than usually at home. Nutritional quality was rated as "needs improvement" (62.5±12.0 points). Low energy and protein intake were not associated with care level, dental status or polymorbidity. High energy intake was positively associated with phase angle (r_p=0.524, p=0.012). Participants at nutritional risk showed a significantly lower energy intake (NRS<3 vs NRS≥3: 1760±249 vs. 1228±406 kcal/d, p=0.009) as well as significantly lower protein intakes (NRS<3 vs. NRS≥3: 0.9±0.2 vs. 0.6±0.1 g/kgBW/d, p=0.007) and a significantly lower phase angle than participants without nutritional risk (NRS<3 vs. NRS≥3: 4.5±0.6° vs. 3.6±0.6°, p=0.014). Low absolute protein intake tends to result in low phase angle (r_p=0.422, p=0.051) and was associated with lower NRS-Score (r_s=-0.589, p=0.002).

Conclusions: Despite sufficient energy intake, recommendations for protein and micronutrient intake could not be met by predominantly well-nourished acutely ill geriatric patients. Therefore, adapted nutrient composition, especially increased nutrient density and higher amounts of protein might be meaningful for hospital catering in acute care geriatrics.

Table 1. Comparison of nutritional intake and requirement

n=24	Intake mean ± SD	Requirement mean ± SD	p-value
Energy in kcal	1627 ± 371	1694 ± 341	0.607
Protein in g	54.9 ± 15.4	83.8 ± 15.8	0.001
Protein in g/kg bw/d	0.8 ± 0.2	1.2 ± 0	<0.001
Fat in g	79.0 ± 23.7	53.2 ± 10.5	0.021
Carbohydrates in g	173.0 ± 51.5	197.6 ± 41.9	0.019
Fibre in g	16.6 ± 8.9	21.2 ± 4.3	0.002
Fluids in ml	1448 ± 477	1750 ± 198	0.032
Calcium in mg	747 ± 243	1000 ± 0	< 0.001
Iron in mg	8.0 ± 3.9	10.0 ± 0.0	0.015
Folate in µg	162.1 ± 66.7	300.0 ± 0.0	< 0.001
Iodine in µg	72.0 ± 32.9	180.0 ± 0.0	< 0.001

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Author Contribution: All authors had contributed to write this work, and had revised the final version.

Key words: dietary intake, geriatrics, acute care, nutritional quality, hospital catering

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Nutrient Profile Models in the Assessment of Breakfast Cereals

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Background/Aims: Nutrient profile models (NPM) are described by the WHO as the science of classifying food by its nutritional composition, with the aim of orientating informed food choices. Due to the increasing prevalence of non-transmissible chronic diseases (NCDs) several nutrient profile models have been issued by various institutions, each of which assesses processed food products in a slightly different way.

Breakfast cereals are amongst the most consumed process food products and citizens often view them as a healthy option, while more dietitians are discouraging their regular consumption.

The main objective of this study was to compare the performance of five nutrient profile models from different region: Nutriscore, Nutrient Profile Model-UK, Health Star Rating System-Australia, Panamericana Model and WHO-model, when applied in the analysis of breakfast-cereals.

Methods: Five breakfast-cereal available in Spanish supermarkets were analysed. The selection was made following criteria of popularity, health claims and ecological origin. The five NPM were applied to each cereal brand following the steps indicated by each model's guidelines. Results obtained were synthesized in a comparative table based on their score and interpretation according to each NPM.