

comparison with the group studied in 1998 (13.5% *v.* 10%). Overweight in boys aged 9 years occurred more often in 2008 in comparison with the study of peers in 1998. We did not find significant differences in prevalence of overweight for the remaining analysed boys' age groups. Variation in prevalence of obesity in boys from both the groups analysed were not statistically significant (7.3% *v.* 6.2%). We did not find considerable differences in the prevalence of obesity in boys for individual age groups in 1998 and 2008 studies.

Variation in prevalence of overweight (12.1% *v.* 13.4%) and obesity (10.3% *v.* 7.8%) in girls at both the groups analysed were not statistically significant. We did not find substantial differences in prevalence of overweight and obesity in girls for individual age group in the 1998 and 2008 studies.

Conclusions: Our study demonstrates stabilization in girls' overweight and obesity in comparison to a slight increase in boys' overweight in schoolchildren from rural area in South-East of Poland.

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Poster Abstracts: Background to Childhood Obesity

13 – Large portions of entrees in school lunches and obesity risk in children living in Piedmont, a Northern Italian region

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Introduction: Large entree portion-sizes may be 'obesogenic', producing excessive intake at meals especially in preschool children/schoolchildren with satiety deficits.

Method: In 2007–2009, using a checklist, we assessed in Piedmont (an Italian Region), in a random sample of 1733 schools, whether the procedures for calibrating servings were consistent with the evidence-based systems suggested by literature (calibrated tools or 'sample-dishes'). Foods portioned at canteens, such as pasta (entree in Italy) or vegetables (side-dish) were studied. Foods pre-weighted in the cooking-centres (meat, etc.) were excluded. Some of the sampled elementary schools were evaluated also for the food amount served in each child's plate (we weighed twice the full/empty plate), compared with the recommendations in the menu plan (Student's *t* test).

Results: Pasta/vegetables are served in 64% of schools 'a glance', in 16% by calibrated tools (93% skimmers

have the same diameter for different age groups) and in 14% by sample dishes. Seventy-nine per cent allow the children to be served twice if they ask. Significant differences between the mean served amounts (pasta 67 + 7 g/vegetables 86 + 34 g) and the recommendations (pasta 60 + 0 g/vegetables 106 + 31 g) were found ($P < 0.05$).

Conclusions: The 'a glance' method preferred by the school canteen staff has a wide inter-operator variability and is not consistent with literature guidelines. The risk is to promote overeating for pasta and a compensatory decrease for vegetables even if the menu plan is nutritionally balanced. Manuals to ensure suitable servings are spread in the USA and included into specific School-Meals-Programs, so we are going to promote similar tools in Piedmont too, verifying their applicability through surveillance actions.

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14 – Evaluation of dietary quality in relation to body composition and socio-economic status in European adolescents

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Introduction: The Diet Quality Index (DQI) is a tool that assesses diet quality in terms of compliance with the Flemish Food-based Dietary Guidelines. The objective was to investigate the correlation between the DQI score of healthy European adolescents and their body composition and socio-economic status.

Method: The study population aged 12.5–17.5 years, consisted of 3002 healthy European adolescents (1582 females) from the HELENA Study. Information on dietary intake was obtained via two, non-consecutive, self-reported 24 h recalls. DQI scores were calculated for all respondents. Partial Pearson correlations (*r*) were calculated, adjusting for the influence of sex, age and Tanner stage.

Results: Mean DQI for boys and girls was, respectively, 51.23 (SD 18.31) and 55.88 (SD 16.69) (*P* < 0.001). Low but significant positive correlations were found between DQI

and BMI *Z*-scores (*r* = 0.051; *P* = 0.006). In separate analyses for both sexes, correlations were stronger in the female group. Similar results were found for skin folds, hip and waist circumference. Correlations with blood pressure were negative; however, only borderline significance was found for the systolic values (*r* = −0.037; *P* = 0.044). Strong correlations were found with the educational level of both mother (*r* = 0.22; *P* < 0.001) and father (*r* = 0.17; *P* < 0.001).

Discussion: Higher DQI scores were associated with lower systolic blood pressure and higher educational level of both parents, confirming the importance of socio-economic status on health and dietary habits. The positive correlations with BMI *Z*-scores and markers of body composition might be attributed to (i) a tendency of under-reporting by overweight people or (ii) following a healthier diet to loose weight.

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15 – Dietary under-reporting by overweight and obese adolescents: results from the HELENA Study

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Aim: To examine under-reporting of energy intakes (EI) in relation to overweight/obesity among adolescents.

Design: Two self-administered computerized 24 h recalls were used in 2330 adolescents aged 12.5–17.5 years across eight EU countries (Austria, Belgium, France, Germany, Greece, Italy, Spain and Sweden). Height, weight and circumferences were measured as body composition indicators. International BMI cut-offs of Cole/IOTF were used to assess overweight/obesity prevalence. Slaughter formula was used to calculate body fat percentage (BF%). BMR was calculated from age-specific FAO/WHO/UNU equations and under-reporting via Goldberg cut-offs for EI/BMR.

Results: The degree of under-reporting was higher for the second 24 h-recall administration than for the first (23% *v.* 19.8%) and higher among girls than among boys (24.3% *v.* 20.5%). When considering mean energy intakes (EI) of the 2 d, 22.5% of the adolescents were categorized as under-reporter. Prevalence of under-reporting was significantly higher in overweight and obese adolescents than in normal/

underweight adolescents (43.9% and 50.8% *v.* 16.7%, respectively). BMI *Z*-scores and BF% were negatively correlated with EI/BMR (−0.35 and −0.38).

Discussion: Although under-reporting appeared in all BMI categories, the prevalence increased with increasing BMI category. These results confirm the general assumption that overweight/obese people tend to under-report more frequently than normal weight people. Possible hypotheses could be that (i) overweight/obese people are on a diet and truly reporting low EI or (ii) they are more prone to social desirable answers. These results may have implications for the interpretation of studies of diet and comorbidities related to obesity among adolescents.

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