Additional file 2 Associations of clustering patterns of diet, PA and sedentary behaviors with BMI or weight status in children and adolescents.

Study [#]	Obesogenic patterns by behaviors examined	BMI or weight status[ł]	Method of analysis	Results
Diet and PA				
[44]	5 clusters 1. Sporty Healthy Eaters 2. Sporty Mixed Eaters 3. Moderate Active Healthy Eaters 4. Unsporting Unhealthy Eaters 5. Sedentary Healthy Eaters	Weight status	χ2 test stratified by gender	No association
PA and sedentary behaviour				
[39]	3 clusters 1. High active/low sedentary 2. Low active/moderate sedentary 3. High active/low sedentary	BMI z-score*	ANOVA	No association
[37]	3 clusters (boys) 1. Techno actives 2. Non-socializing actives 3. Uninvolved inactives 3 clusters (girls) 1. Sociable actives 2. Non-socializing actives 3. Uninvolved inactives	Weight status (categorised as underweight, normal weight, overweight, obese)	χ2 test	No association

[51]	3 classes (boys) 1. Active 2. Sedentary 3. Low media/moderate activity 3 classes (girls) 1. Active 2. Sedentary 3. Low media/functional activity	Weight status* (categorised as overweight)	Latent multinominal logistic regression	A higher proportion of girls in class 2 were overweight compared to classes 1 and 3 (p<0.05). A higher proportion of boys in class 2 were overweight compared to class 1 (p<0.05).
[46]	5 clusters (boys) 1. Healthy behavior pattern 2. High TV viewers 3. Mixed pattern 4. High PC users 5. Unhealthy behavior 5 clusters (girls) 1. Healthy behavior 2. High TV viewers 3. Low sedentary behavior and low physical exercise 4. High PC users 5. Unhealthy behavior	Weight status	Sex stratified multilevel logistic regression adjusted for age. Random intercept assigned for country and school level.	Compared to cluster 1, boys in clusters 3 (OR=1.5; 95% CI: 1.18-1.90) cluster 4 (OR=1.43 ; 95% CI: 1.05-1.96) and cluster 5 OR=1.18 ; 95% CI: 1.18-2.37) and girls in cluster 2 OR=1.64 ; 95% CI: 1.23-2.18) and 4 OR=1.42 ; 95% CI: 1.00-2.01) were more likely to be overweight.
Diet, PA and sedentary behaviour				
[16]‡	7 clusters (boys) 1. School Clubs & Sports 2. Sports 3. Moderately active 4. Sedentary Behaviors 5. Junk Food & Smoke	Weight status (obesity prevalence, 5 year obsesity incidence)*	Sex stratified multivariate logistic regression adjusted for race, household income, parental	Compared to cluster 1, clusters 2, 4 and 6 were significantly associated with obesity prevalence and incidence among girls. Among boys, being in cluster 4 was inversely associated with obesity

	6. Dieters 7. Low diet & activity clusters (girls) 1. School Clubs & Sports 2. Average diet & Activity 3. High Consumer 4. Sedentary Behaviors 5. Junk Food & Low Activity 6. Restrictive Dieting & Smoking		education, region and wave specific age and season.	prevalence but not obesity incidence, compared to cluster 1.
[18]	5 clusters 1. Young PA enthusiasts 2. All-round healthy behaviors 3. Screen-time focussed 4. Low on FV and PA 5. Energy dense eaters who watch	BMI z-score*	ANOVA	No association
[17][‡]	5 classes 1. High-sedentary, high-fat/high-sugar snacks, not weight conscious 2. High-sedentary, high-fat/high-sugar snacks, weight conscious 3. Dieting without exercise, weight conscious 4. Active, healthy eating 5. Low healthy, snack food, inactive, not weight conscious	Weight status* (categorised as obese, overweight, healthy, underweight)	χ2 test	Higher overweight and obesity prevalence in classes 1 and 2 (χ2=279.8, p<0.001)
[40][‡]	3 clusters 1. Low activity, low-risk behavior 2. High media time and high-risk behavior 3. High activity, high-risk behavior	Overweight and obesity prevalence* Four year incidence of overweight/obesity*	χ2 test	Four year incidence of obesity highest in cluster 1 and lowest in cluster 3 (p<0.05). No other associations were found with weight status.

Ref	Clusters	Outcome	Analysis	Result
[43]	5 clusters 1. Unhealthy 2. Sedentary 3. Active, low diet quality 4. Inactive, high diet quality 5. Healthy	Weight status* (categorised as underweight, normal weight, overweight, obese)	χ2 test stratified by gender	No association
[45]	4 clusters 1. Sport media-oriented mixed eaters 2. Academic healthy eaters 3. Inactive healthy eaters 4. Inactive media oriented unhealthy eaters	Weight status	ANOVA stratified by gender	No association
[48]‡	3 clusters 1. Active, high screen-time users 2. Active, low screen-time users 3. Less active, least frequent drinkers	BMI z-scores	ANOVA	No association
[49]	4 clusters (compared cluster 1) 1. Healthy 2. Quite healthy 3. Quite unhealthy 4. Unhealthy	BMI (kg/m^2)	Linear regression adjusted for gender and parental education	Being in cluster 4 (compared cluster 1) was inversely associated with BMI (β=-1.27, p=0.048)

Abbreviations: BMI, body mass index; CI, confidence interval; FV, fruit and vegetable; PA, physical activity;

* Derived from measured height and weight

ŧ Unless indicated, weight status categories included overweight (including obesity) or not overweight

‡Also examined other behaviors (e.g. alcohol, smoking, dieting and psychological behavior)