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Established diet quality indices are not universally associated with body composition in young adult women

Sofija E Zagarins[1,2,*], Alayne G Ronnenberg[2] and Elizabeth R Bertone-Johnson[3]
[1]Department of Health Sciences, 109 Locklin Hall, Springfield College, 263 Alden Street, Springfield, MA 01109-3797, USA: [2]Department of Nutrition, 213 Chenoweth Lab, School of Public Health and Health Sciences, University of Massachusetts Amherst, 100 Holdsworth Way, Amherst, MA 01003-9282, USA: [3]Departments of Biostatistics and Epidemiology, and Health Promotion and Policy, 325 Arnold House, School of Public Health and Health Sciences, University of Massachusetts, Amherst, MA, USA

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Abstract
Objective: To determine which established diet quality indices best predict weight-related outcomes in young women.
Design: In this cross-sectional analysis, we collected dietary information using the Harvard FFQ and measured body fat percentage (BF%) by dual-energy X-ray absorptiometry. We used FFQ data to derive five diet quality indices: Recommended Food Score (RFS), Healthy Eating Index 2015 (HEI-2015), Alternate Healthy Eating Index 2010 (AHEI-2010), alternate Mediterranean Diet Score (aMED) and Healthy Plant-Based Diet Index (HPDI).
Setting: University of Massachusetts at Amherst.
Participants: Two hundred sixty healthy women aged 18–30 years.
Results: The AHEI-2010 and HPDI were associated with BMI and BF%, such that a ten-point increase in either diet score was associated with a 1·2 percentage-point lower BF% and a 0·5 kg/m^2 lower BMI ($P < 0·05$). Odds of excess body fat (i.e. BF % > 32 %) were 50 % lower for those in the highest *v*. lowest tertile of the AHEI-2010 ($P = 0·04$). Neither the RFS nor HEI-2015 was associated with BMI or BF%; the aMED was associated with BMI but not BF%.
Conclusions: These results suggest that diet quality tends to be inversely associated with BMI and BF% in young women, but that this association is not observed for all diet quality indices. Diet indices may have limited utility in populations where the specific healthful foods and food groups emphasised by the index are not widely consumed. Future research should aim to replicate these findings in longitudinal studies that compare body composition changes over time across diet indices in young women.

Keywords
Body fat percentage
Recommended food score
Healthy eating index 2015
Alternate healthy eating index 2010
Alternate Mediterranean Diet Score
Healthy plant-based diet index
Young adult women

The increasing prevalence of overweight and obesity in recent decades has generated a large body of research aimed at identifying and understanding factors that contribute to weight gain and obesity, and studies of specific dietary factors including energetic intake, macronutrients and selected micronutrients (e.g. Ca, vitamin D) have long been a focus of this research. However, there is growing awareness of the importance of studying overall diet as a way to address the complex interrelationships between foods and nutrients, especially in the context of chronic conditions like obesity that have many contributing factors[1,2].

Two recent reviews of studies that used *a posteriori* methods (e.g. factor analysis, cluster analysis) to define participants' overall diet pattern found that prudent/healthy diet patterns tended to be associated with a reduced risk of obesity-related outcomes, while Western/unhealthy diet patterns tended to increase risk, although these results varied by population[3,4]. However, the specific components of these broadly defined diet patterns are not consistent across study populations, making it difficult to form specific public health recommendations based on these findings[5,6].

*Corresponding author: Email szagarins@springfield.edu

The *a priori* diet index approach addresses this issue by quantifying overall diet in terms of adherence to established, well-defined dietary guidelines or patterns. Studies that use this approach suggest that diet quality tends to be inversely associated with obesity-related outcomes, but this association varies by population and a recent review determined that the available evidence is inconclusive[7]. Diet quality itself varies across population subgroups, such that young adults in the US have poorer diet quality than children and older adults[8,9]. US adults, and especially women, tend to gain a substantial amount of weight from early to middle adulthood[10], and determining the extent to which diet quality may be a contributing factor to this weight gain would inform future public health interventions.

Studies of diet indices and obesity in young women are conflicting, with some reporting an inverse association[11-13] and others reporting no association[14,15]. These conflicting results may be related to differences in study populations or to how weight-related parameters were measured (e.g. studies of BMI may underestimate adiposity relative to studies of body fat percentage (BF%)[16]), or to the different diet indices used in each analysis.

Although a variety of diet indices have been developed to measure adherence to specific dietary guidelines and patterns, no studies have simultaneously examined multiple established diet indices to determine which of these best predict weight-related outcomes in young adult women. The goal of the present study is to determine which established diet quality indices best predict BMI and BF% in this population.

Methods

We conducted this analysis using data from the cross-sectional UMass Vitamin D Status Study, which enrolled 288 premenopausal women aged 18–30 years from 2006 through 2011 at the University of Massachusetts at Amherst[17,18]. Women were eligible for the study if they were: currently having menstrual periods; did not report a history of high blood pressure or elevated cholesterol, kidney or liver disease, bone disease such as osteomalacia, digestive disorders, rheumatologic disease, multiple sclerosis, thyroid disease, hyperparathyroidism, cancer, type 1 or type 2 diabetes or polycystic ovaries and were not taking corticosteroids, anabolic steroids, anticonvulsants, cimetidine or propranolol. For the present analysis, we excluded participants who did not participate in the body composition assessment, as well as participants with implausible dietary intakes, defined using Willett's criteria for women of total energetic intake <2092 kJ/d or >14 644 kJ/d[19]. However, given that high activity levels increase energetic needs, we retained participants with dietary intakes between 3500 and 4500 kcal/d if their physical activity level was >100 metabolic equivalent h/week. We collected all study measurements during a single study visit, with the exception of the body composition assessment for thirty-one participants, as described below. We assessed questionnaires for completeness before the end of the study visit and asked participants to clarify any missing, incomplete or unclear data. This study was conducted according to the guidelines laid down in the Declaration of Helsinki, and all procedures involving study participants were approved by the Institutional Review Board at the University of Massachusetts at Amherst. Written informed consent was obtained from all participants.

Body composition assessment

We measured weight and height using a standard scale and a wall-mounted stadiometer, respectively, and calculated BMI as weight in kg divided by height in metres squared. We measured BF% by dual-energy X-ray absorptiometry using the total body scan mode on a narrow angle fan GE Lunar Prodigy scanner (GE Lunar Corp.). We performed daily calibrations using the standard calibration phantom provided by the manufacturer and analysed all scans using the manufacturer's encore 2002 software package, version 6.80.002. The *in vivo* precision of this machine ranges from 2 % to 3 % for BF%[20]. We performed and analysed all scans on the morning of each participant's study visit, with the exception of thirty-one participants who came back for their scan 2–8 weeks after their initial visit (e.g. due to lack of availability of the scanner during the study visit).

Diet assessment

We asked participants to report their usual diet over the 2 months prior to their study visit using the validated Harvard FFQ[21,22] and asked participants to provide information on the use of any soya products and orange juice fortified with Ca and/or vitamin D in the open response section of the questionnaire. Completed FFQ were analysed using the Harvard University Food Composition Database, which was derived using sources from the US Department of Agriculture, as well as from food manufacturers and published research[23,24]. We used FFQ data to derive five established diet quality indices, which were selected because they measure adherence to established dietary guidelines and widely promoted dietary patterns.

Kant and colleagues created the tally-based Recommended Food Score (RFS) to measure consumption of specific foods emphasised by established dietary guidelines[25]. McCullough and colleagues adapted the RFS for use with several versions of the Harvard FFQ[26], although not for the version used in the present analysis. The version of the FFQ used for this analysis is similar to the 1986 version of the Harvard FFQ with the following exceptions: (i) zucchini was included with eggplant as a food item; (ii) green peppers, sauerkraut and avocado were not included; (iii) cabbage and coleslaw were combined into a single

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food item and (iv) beets and prunes were included. After incorporating these modifications into the scoring criteria proposed by McCullough and colleagues, possible overall scores on our version of the RFS ranged from 0 (worst) to 51 (best).

The Healthy Eating Index (HEI) measures how well an individual's diet adheres to the recommendations outlined in the Dietary Guidelines for Americans[27]. We used the criteria described by Krebs-Smith and colleagues to derive the updated 2015 version of the HEI (HEI-2015)[28]. We converted FFQ data on servings per day to cup- and ounce-equivalents using the conversions outlined in the 2015-2020 Dietary Guidelines for Americans[27]. We used the criteria described by Shan and colleagues to derive the component scores for dairy foods and protein foods, which involved including full reported servings of dairy and protein foods in these categories rather than including only the fat-free or lean portions of these foods[29]. The HEI-2015 includes nine adequacy components (i.e. higher scores indicate better diet) and four moderation components (i.e. higher scores indicate poorer diet; Supplemental Table), and possible overall scores range from 0 (worst) to 100 (best).

The Alternate Healthy Eating Index (AHEI) is an alternative to the HEI that emphasises foods and nutrients associated with chronic disease risk[30]. We used the criteria described by Chiuve and colleagues to derive the updated 2010 version of the AHEI (AHEI-2010)[30]. The AHEI-2010 includes six adequacy components and five moderation components (see online Supplementary material, Supplemental Table), and possible overall scores range from 0 (worst) to 110 (best).

The alternate Mediterranean Diet Score (aMED) measures adherence to the Mediterranean Diet with consideration for the scientific literature on diet and chronic disease risk[31]. We used the criteria described by Shan and colleagues[29] to derive the aMED, which includes seven adequacy components and two moderation components (see online Supplementary material, Supplemental Table), with possible overall scores ranging from 9 (worst) to 45 (best).

The Healthful Plant-Based Diet Index (HPDI) measures consumption of plant foods that are associated with improved health outcomes, including whole grains, fruits and vegetables[32]. We used the criteria described by Satija and colleagues to derive the HPDI[32], which includes seven adequacy components and eleven moderation components (see online Supplementary material, Supplemental Table), with possible overall scores ranging from 18 (worst) to 90 (best).

Covariate assessment

Participants self-reported demographic and lifestyle information on study questionnaires adapted from those used in the Nurses' Health Study II[33,34]. To measure physical activity, we asked participants to report the time they spent each week engaged in specific activities including walking, jogging, running, bicycling, aerobics/dancing, tennis/racket sports, swimming, yoga/Pilates and weight training and calculated total h/week of activity in metabolic equivalents[35].

Statistical analysis

We analysed the data for this paper using SAS software, version 9.4M6 for SAS Studio (copyright 2018, SAS Institute Inc.). We categorised diet indices into tertiles using PROC RANK and compared means and standard deviations of continuous covariates across diet index tertiles using ANOVA; we compared percentages of categorical covariates across diet index tertiles using χ^2. We calculated Pearson correlation coefficients to measure the strength of associations between the continuous diet index measures.

We examined the dependent body composition variables for normality using the Shapiro–Wilks normality test. We created log-transformed versions of non-normally distributed continuous variables and compared models with original and log-transformed variables to determine whether transformation changed the results. When results differed, we presented untransformed unstandardised regression coefficients and 95 % CI in the results table for ease of interpretation and presented standardised regression coefficients values that reflected transformed variables.

We examined associations between body composition measures (BMI and BF%) and continuous diet quality indices using linear regression and used logistic regression to compare the odds of having excess body fat (i.e. BF % > 32 %)[36] in the highest *v.* lowest diet index tertiles. We adjusted all models for variables significantly associated with body composition or diet index measures (i.e. age, energetic intake, physical activity level, age at menarche, alcohol consumption, smoking status). We used an alpha level of 0·05 to define statistical significance. Based on a *post hoc* power analysis, our sample size yielded 81·2 % power to detect a 20 % difference in outcome status between tertiles of exposure.

Results

For this analysis, we excluded nine women who did not complete the body composition assessment, as well as nineteen women with implausible dietary intakes. These exclusions yielded a final sample size of 260 women. The mean age for the total sample was 21·4 (SD 2·9) years, and 86·9 % of women were non-Hispanic white. Mean BMI in the study population was 22·9 (SD 3·2), and mean BF% was 31·8 (SD 7·8), with fifty-five participants meeting BMI-based criteria for obesity (i.e. BMI ≥ 30 kg/m^2) and

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123 participants meeting BF%-based criteria for overfat (i.e. BF% > 32 %). Covariates tended to vary across diet index categories, although the level of significance and pattern of variability differed by diet index (Table 1). Diet index variables were significantly associated with one another, with *r* ranging from 0·27 to 0·80 ($P < 0·0001$ for all combinations; Table 2).

In multivariable linear regression models, each diet index tended to be inversely associated with body composition measures, such that higher index scores were associated with lower BMI and BF% (Table 3). The AHEI-2010 and HPDI were each significantly associated with BMI and BF%, such that a ten-point increase in either diet score was associated with a 1·2 percentage-point lower BF% and a 0·5 kg/m^2 lower BMI ($P < 0·05$). Other diet indices were not significantly associated with BF% and BMI.

In multivariable logistic regression models, odds of excess body fat tended to be lower in the highest *v.* lowest diet index tertiles (Table 4). However, only the AHEI-2010 was statistically significantly associated with odds of excess body fat.

Given that both diet and body composition are associated with physical activity, and given that approximately 15 % of women in this sample reported high activity levels (defined as >100 metabolic equivalent h/week, which corresponds to 1–2 h of moderate-to-vigorous activity per d), we conducted a sensitivity analysis excluding this highly active group from our sample. Results for the reduced sample were similar to those for the full sample (data not shown). Furthermore, mean body fat percentage was similar in women who reported high activity levels *v.* women who did not (30·3 % and 31·9 %, respectively).

Discussion

This analysis suggests that diet quality tends to be inversely associated with body composition in young women, but that the strength and significance of this association vary across indices. The AHEI-2010 and HPDI were both statistically significant predictors of BMI and BF%, while the RFS and HEI-2015 were not significantly associated with either BMI or BF%. The aMED was significantly associated with BMI but not with BF%.

These findings are similar to those reported in previous studies in young women, in that the association between diet quality and body composition varies depending on how these variables are measured and analysed. Given that BMI is considered to be a less-valid measure of adiposity and may underestimate adiposity relative to BF%[16], results based on BF% should be prioritised. Drenowatz and colleagues observed that the HEI-2010 was not associated with BF% in young women[15], while Bailey and colleagues reported that a statistically significant inverse association between HEI-2010 and BF% was attenuated when models were adjusted for physical activity[11]. Boggs and colleagues reported that the AHEI-2010 was associated with BMI in normal-weight Black women, but not in overweight Black women[12]. Landry and colleagues reported that the HEI-2015 was not associated with BMI or BF %[14], while Aljadani and colleagues reported that young women in the highest tertile of an Australian version of the RFS gained less weight than young women in the lowest tertile[13].

Although the conflicting results in these previous studies can be attributed in part to differences in the study populations, weight-related outcomes and analytic methods, the present study demonstrates that even within the same study population and using consistent methods, results vary across different measures of diet quality. The different results we observed for each diet index measure must therefore be related to differences in the indices themselves, and diet indices that emphasise weight-related aspects of diet are likely to better quantify the association between diet and weight-related outcomes. For example, the HEI-2015 is designed to capture the best diet for general health across many populations[28], and this may limit its utility as a predictor of specific outcomes in specific populations. Furthermore, while experts praise the HEI-2015 for incorporating some important dietary factors that were omitted in previous versions of the HEI, they argue that the HEI-2015 continues to fall short in terms of reflecting the best available evidence for promoting health[37]. These issues may explain why the HEI-2015 was not associated with weight-related outcomes in the current analysis.

In this analysis, diet indices that penalised consumption of red or processed meats and sugar-sweetened beverages (i.e. AHEI-2010, HPDI) were most strongly associated with weight-related outcomes. It may be that these specific dietary components are key drivers of weight gain in young women, or it may be that consumption of red or processed meats and sugar-sweetened beverages is markers for other unhealthy lifestyle behaviours in this population. While the aMED also penalises consumption of red and processed meats, the aMED prioritises consumption of nuts, legumes and fish, which were not widely consumed in the population included in the current analysis and so may not adequately reflect healthy eating behaviours in this population. Similarly, the RFS assigns points based on consumption of specific healthy foods, but many of the foods represented in the RFS were not widely consumed in the study population, such that the mean score on the RFS was only 17·4 out of a possible 51 in this population.

This analysis is based on a relatively small sample size, which may have limited our statistical power and ability to distinguish between diet indices. Furthermore, mean diet scores in our study population were well below the maximum possible scores, and having fewer participants with higher dietary scores could impair our ability to measure the association with body composition precisely. However, the mean diet scores in our study population are consistent with those observed in other studies of diet

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Table 1 Participant characteristics across tertiles of the Recommended Food Score (RFS), Healthy Eating Index 2015 (HEI-2015), Alternate Healthy Eating Index 2010 (AHEI-2010), Alternate Mediterranean Diet Score (aMED) and Healthy Plant-Based Diet Index (HPDI)†

	RFS Tertile						HEI-2015 Tertile						AHEI-2010 Tertile						aMED Tertile						HPDI Tertile					
	1		2		3		1		2		3		1		2		3		1		2		3		1		2		3	
Variable	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Dietary score, range	2–14		15–20		21–35		37–64		64–72		72–92		25–47		47–57		57–84		14–25		26–30		31–41		28–48		48–56		56–84	
Dietary score	10·2	3·1	17·2	1·5	24·1	2·9	57·5	5·6	68·1	2·3	77·5	4·0	40·7	5·2	51·9	2·8	63·5	5·3	21·4	3·0	28·1	1·4	34·8	2·6	42·0	4·2	51·7	2·6	63·0	6·1
Age (years)	21·5	2·7	21·3	2·8	21·5	3·2	20·8	2·5	21·6	3·0	21·8	3·1	20·8	2·7	21·5	2·9	21·9*	3·0	20·7	2·1	21·8	3·2	21·9*	3·1	20·5	2·4	21·6	3·0	22·0*	3·0
Non-Hispanic white	87·3		87·1		86·2		88·2		80·5		92·0		87·1		87·4		86·2		88·9		88·2		83·3		84·3		87·5		88·6	
Total energy intake in kcal/d	1677	617	2097	669	2387*	612	2059	580	2067	753	2069	742	2080	596	1989	715	2125	760	1824	644	1950	588	2443*	693	2296	617	2002	667	1907*	738
Physical activity in MET-h/week	37·1	37·2	54·9	46·6	68·2*	56·5	41·9	45·1	58·5	55·1	61·2*	44·7	43·7	44·6	53·3	54·3	64·7*	46·0	41·1	41·1	59·5	59·3	62·0*	43·1	42·4	43·4	57·1	55·6	61·6*	45·8
Age at menarche	12·7	1·7	12·2	1·2	12·6*	1·2	12·6	1·6	12·4	1·2	12·4	1·3	12·5	1·6	12·3	1·4	12·6	1·2	12·7	1·5	12·3	1·5	12·5	1·2	12·6	1·4	12·4	1·4	12·4	1·4
Alcohol intake in g/d	5·7	8·1	6·8	7·7	6·1	9·2	5·4	8·4	6·0	6·7	7·3	9·6	6·1	8·8	6·4	6·8	6·1	9·3	5·7	8·9	6·9	9·2	6·2	6·7	7·8	11·6	5·4	6·4	5·6	5·9
Smoker‡	8·9		17·2		18·4		11·8		13·8		19·5		11·8		12·6		20·7		10·0		16·5		19·1		10·7		11·4		23·0*	

MET-h, metabolic equivalents hours.
*$P < 0{\cdot}05$ for difference across tertiles, calculated using ANOVA for continuous variables and χ^2 for categorical variables.
†Data are percentages unless otherwise indicated.
‡Smoked 20 or more packs of cigarettes in lifetime.

Table 2 Pearson correlation coefficients for diet index variables*

	HEI-2015	AHEI-2010	aMED	HPDI
RFS	0·49	0·48	0·68	0·27
HEI-2015		0·73	0·74	0·59
AHEI-2010			0·80	0·79
aMED				0·63

RFS, Recommended Food Score; HEI-2015, Healthy Eating Index 2015; AHEI-2010, Alternate Healthy Eating Index 2010; aMED, Alternate Mediterranean Diet Score; HPDI, Healthy Plant-Based Diet Index.
*All correlation coefficients are statistically significant at $P < 0.0001$.

Table 3 Association between diet indices and body composition measures estimated using unadjusted and multiple linear regression

	Unadjusted models				Adjusted models*			
	Unstandardised		*P*-value	Standardised β	Unstandardised		*P*-value	Standardised β
Diet index	β	95 % CI			β	95 % CI		
Recommended Food Score								
BMI†	−0·04	−0·10, 0·02	0·23	−0·08	−0·05	−0·12, 0·02	0·20	−0·09
Body fat percentage	−0·11	−0·27, 0·05	0·16	−0·09	−0·06	−0·24, 0·11	0·47	−0·05
Healthy Eating Index 2015								
BMI	−0·02	−0·06, 0·02	0·40	−0·05	−0·03	−0·07, 0·02	0·25	−0·07
Body fat percentage	−0·06	−0·16, 0·05	0·28	−0·07	−0·04	−0·15, 0·06	0·42	−0·05
Alternate Healthy Eating Index 2010								
BMI	−0·04	−0·08, −0·00	0·03	−0·14	−0·05	−0·08, −0·01	<0·01	−0·15
Body fat percentage	−0·15	−0·24, −0·06	<0·01	−0·19	−0·12	−0·21, −0·03	0·01	−0·16
Alternate Mediterranean Diet Score								
BMI	−0·06	−0·13, 0·00	0·07	−0·11	−0·07	−0·14, −0·01	0·04	−0·14
Body fat percentage	−0·17	−0·33, −0·02	0·03	−0·13	−0·15	−0·31, 0·02	0·08	−0·12
Healthy Plant-Based Diet Index								
BMI	−0·04	−0·08, 0·00	0·07	−0·11	−0·05	−0·09, −0·01	0·03	−0·15
Body fat percentage	−0·14	−0·24, −0·05	<0·01	−0·18	−0·12	−0·23, −0·02	0·02	−0·15

*Adjusted for age, energetic intake, physical activity, age at menarche, alcohol intake, smoking status (smoked 20 or more packs of cigarettes in lifetime *v.* no).
†Unstandardised β and 95 CI reflect untransformed dependent variable; standardised β reflects transformed dependent variable.

Table 4 OR for overfat (body fat percentage > 32 %) by tertile of diet indices

		Unadjusted			Adjusted*		
Diet Index	Body Fat Percentage > 32 %	OR	95 % CI	*P*-value	OR	95 % CI	*P*-value
Recommended Food Score							
Tertile 1	*n* 42	ref			ref		
Tertile 2	*n* 43	0·78	0·43, 1·42	0·41	0·65	0·33, 1·28	0·21
Tertile 3	*n* 38	0·70	0·38, 1·29	0·25	0·77	0·37, 1·58	0·47
Healthy Eating Index 2015							
Tertile 1	*n* 43	ref			ref		
Tertile 2	*n* 40	0·85	0·47, 1·55	0·60	0·93	0·48, 1·77	0·82
Tertile 3	*n* 40	0·85	0·47, 1·55	0·60	0·92	0·48, 1·76	0·79
Alternate Healthy Eating Index 2010							
Tertile 1	*n* 46	ref			ref		
Tertile 2	*n* 48	1·07	0·59, 1·95	0·82	1·17	0·62, 2·23	0·63
Tertile 3	*n* 29	0·44	0·24, 0·80	0·01	0·50	0·26, 0·97	0·04
Alternate Mediterranean Diet Score							
Tertile 1	*n* 48	ref			ref		
Tertile 2	*n* 37	0·69	0·38, 1·25	0·22	0·68	0·35, 1·31	0·25
Tertile 3	*n* 38	0·74	0·41, 1·34	0·32	0·86	0·43, 1·72	0·66
Healthy Plant-Based Diet Index							
Tertile 1	*n* 45	ref			ref		
Tertile 2	*n* 45	0·91	0·50, 1·65	0·75	1·03	0·53, 2·00	0·94
Tertile 3	*n* 33	0·52	0·28, 0·96	0·04	0·53	0·26, 1·09	0·09

*Adjusted for age, energetic intake, physical activity, age at menarche, alcohol intake, smoking status (smoked 20 or more packs of cigarettes in lifetime *v.* no).

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quality in adolescents and young adults in the US, which identify these age groups as having relatively low diet quality as compared with children and older adults[8,9]. This suggests that our results would generalise to other populations of adolescents and young adults in the US. Similarly, while this analysis is based on a relatively homogeneous study population of young, predominately white women, consistency between our findings and those of studies in other populations suggests that our results may generalise more broadly. For example, a study in young African American women reported an inverse association between the AHEI-2010 and obesity risk[12], and studies in older men and women reported inverse associations between both the AHEI-2010 and HPDI and weight gain[38,39].

It is also important to consider the potential for confounding and residual confounding in any dietary analyses, and while we did measure and adjust for a number of covariates known to be associated with diet and body composition, misclassification in the covariate data is likely present to some degree; for example, although we used a validated questionnaire to measure physical activity, an objective assessment tool would likely have produced more valid physical activity data. However, our relatively homogeneous study population may limit the potential for confounding, such that physical activity and other lifestyle factors related to diet are likely more consistent within a population of young, healthy women than in the general population. Similarly, while misclassification of dietary data is always a concern in nutrition research, our study population included university students who are likely better able to estimate dietary intake on an FFQ as compared with the general population.

In conclusion, the current analysis suggests that adherence to the 2015–2020 Dietary Guidelines for Americans, as measured using the HEI-2015, is not associated with BMI or BF% in young women and that the RFS and aMED may have limited utility in populations where the specific healthful foods and food groups emphasised by these indices are not widely consumed. The inverse association with BMI and BF% observed for the AHEI-2010 and HPDI suggests that these indices emphasise dietary components important to weight-related outcomes in young women, although these results could reflect confounding or residual confounding by lifestyle factors associated with these dietary components. Future research should aim to replicate these findings in well-controlled longitudinal studies that compare body composition changes over time across diet index measures in young women.

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Supplementary material

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