Supplementary Table S1. Subgroup analysis of the Interaction of the usage of female hormones and Life's Essential 8 scores with the presence of metabolic syndrome

	Interaction		Usage of female hormone			
			Used		Not used	
	OR (95% CI)	*P* value for interaction	OR (95% CI)	*P* value	OR (95% CI)	*P* value
Life's Essential 8 score (per 10 units)	0.53 (0.47-0.60)	0.57	0.49 (0.43-0.55)	<0.001	0.54 (0.48-0.60)	<0.001
Cardiovascular health status		0.38		<0.001		<0.001
Low (0-49)	1 (Reference)		1 (Reference)		1 (Reference)	
Moderate (50-79)	0.39 (0.28-0.53)		0.32 (0.18 -0.55)		0.39 (0.29-0.53)	
High (80-100)	0.06 (0.03-0.10)		0.07 (0.04-0.12)		0.06 (0.03-0.10)	
Health behaviour score (per 10 units)	0.88 (0.83-0.93)	0.51	0.85 (0.79-0.92)	<0.001	0.88 (0.83-0.94)	<0.001
Health behaviour status		0.11		<0.001		0.006
Low (0-49)	1 (Reference)		1 (Reference)		1 (Reference)	
Moderate (50-79)	0.76 (0.58-1.00)		0.45 (0.28-0.71)		0.77 (0.59-1.00)	
High (80-100)	0.56 (0.39-0.79)		0.36 (0.23-0.57)		0.56 (0.39-0.80)	
Health factor score (per 10 units)	0.54 (0.50-0.59)	0.56	0.50 (0.45-0.56)	<0.001	0.54 (0.50-0.59)	<0.001
Health factor status		0.90		<0.001		<0.001
Low (0-49)	1 (Reference)		1 (Reference)		1 (Reference)	
Moderate (50-79)	0.24 (0.18-0.32)		0.21 (0.14-0.32)		0.24 (0.18-0.32)	
High (80-100)	0.05 (0.03-0.08)		0.04 (0.02-0.07)		0.05 (0.03-0.08)	

Adjusted for race, marital status, education level, age, ratio of family income to poverty, alcohol drinking status, average alcohol consumed per day

Supplementary Table S2. Associations of the Life's Essential 8 scores with metabolic syndrome (with race/ethnicity-specific waist circumference cut-offs) in postmenopausal women in 2011-2020 NHANES study.

	Crude Model[a]		Full Model[b]	
	Odds Ratio (95% CI)	*P* value	Odds Ratio (95% CI)	*P* value
Life's Essential 8 score (per 10 units)	0.53 (0.50-0.57)	<0.001	0.52 (0.48-0.57)	<0.001
Cardiovascular health status				<0.001
Low (0-49)	1 (Reference)		1 (Reference)	
Moderate (50-79)	0.36 (0.28-0.45)	<0.001	0.37 (0.28-0.49)	<0.001
High (80-100)	0.06 (0.05-0.08)	<0.001	0.07 (0.05-0.09)	<0.001

Health behavior score (per 10 units)	0.86 (0.83-0.90)	<0.001	0.87 (0.84-0.91)	<0.001
Health behaviour status				<0.001
Low (0-49)	1 (Reference)		1 (Reference)	
Moderate (50-79)	0.66 (0.54-0.81)	<0.001	0.66 (0.51-0.86)	<0.001
High (80-100)	0.46 (0.37-0.57)	<0.001	0.51 (0.38-0.67)	<0.001
Health factor score (per 10 units)	0.52 (0.50-0.55)	<0.001	0.53 (0.50-0.57)	<0.001
Health factor status				<0.001
Low (0-49)	1 (Reference)		1 (Reference)	
Moderate (50-79)	0.23 (0.19-0.27)	<0.001	0.24 (0.19-0.29)	<0.001
High (80-100)	0.04 (0.03-0.06)	<0.001	0.05 (0.03-0.07)	<0.001

[a]Crude Model: Not adjusted for any covariate

[b] Full Model: Adjusted for race, marital status, education level, age, ratio of family income to poverty, alcohol drinking status, and average alcohol consumed per day

Waist circumference cut-offs; Mexican American and Other Hispanic: male ≥102cm, female ≥97cm; Non-Hispanic White, Non-Hispanic Black and Other Race- Including Multi-Racial: male ≥102cm, female ≥88cm; Non-Hispanic Asian male ≥102cm, female ≥97cm

Supplementary Table S3 Associations of metabolic syndrome components with Life's Essential 8 scores in postmenopausal women in 2011-2020 NHANES

	LE8 score		**Health behaviour score**		**Health factor score**	
	Odds Ratio (95% CI)	***P* value**	**Odds Ratio (95% CI)**	***P* value**	**Odds Ratio (95% CI)**	***P* value**
Waist Circumfrerence						
Normal	1 (Reference)		1 (Reference)		1 (Reference)	
High (≥88 cm in women and ≥102 cm in men)	0.94 (0.93-0.95)	<0.001	1.00 (0.99-1.00)	0.17	0.91(0.90-0.92)	<0.001
Triglycerides						
Normal	1 (Reference)		1 (Reference)		1 (Reference)	
High (≥150 mg/dL or treatment for high triglycerides)	1.00 (0.99-1.42)	0.37	1.00 (0.99-1.00)	0.41	1.00(0.99-1.01)	0.42
HDL levels						
Normal	1 (Reference)		1 (Reference)		1 (Reference)	
Low (<40 mg/dL in men and <50 mg/dL in women) or medication for low HDL cholesterol levels)	0.98(0.97-0.99)	<0.001	0.99 (0.99-1.00)	0.01	0.98(0.97-0.99)	<0.001
Blood pressure						
Normal	1 (Reference)		1 (Reference)		1 (Reference)	
High (systolic blood pressure ≥130 mmHg, diastolic blood pressure ≥85 mmHg, or both or antihypertensive medication)	0.93(0.92-0.94)	<0.001	0.99(0.98-1.00)	0.002	0.91(0.90-0.92)	<0.001

Fasting glucose levels						
Normal	1 (Reference)		1 (Reference)		1 (Reference)	
High (≥100 mg/dL or treatment for hyperglycemia)	0.95(0.93-0.96)	<0.001	1.00(0.99-1.00)	0.16	0.92(0.91-0.93)	<0.001

Adjusted for race, marital status, education level, age, ratio of family income to poverty, alcohol drinking status, and average alcohol consumed per day and metabolic syndrome components that were not used in the respective model

Table S4. STROBE-nut: An extension of the STROBE statement for nutritional epidemiology

Lachat C et al. (2016) STrengthening the Reporting of OBservational studies in Epidemiology – Nutritional Epidemiology (STROBE-nut): an extension of the STROBE statement. Plos Medicine 13(6) http://dx.doi.org/10.1371/journal.pmed.1002036 pdf or online version.

Item	Item nr	STROBE recommendations	Extension for Nutritional Epidemiology studies (STROBE-nut)	Reported on page #
Title and abstract	1	(a) Indicate the study's design with a commonly used term in the title or the abstract. (b) Provide in the abstract an informative and balanced summary of what was done and what was found.	**nut-1** State the dietary/nutritional assessment method(s) used in the title, abstract, or keywords.	**1 and 2**
Introduction				
Background rationale	2	Explain the scientific background and rationale for the investigation being reported.		**2**
Objectives	3	State specific objectives, including any pre-specified hypotheses.		**2**
Methods				
Study design	4	Present key elements of study design early in the paper.		3

Item	Item nr	STROBE recommendations	Extension for Nutritional Epidemiology studies (STROBE-nut)	Reported on page #
Settings	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection.	**nut-5** Describe any characteristics of the study settings that might affect the dietary intake or nutritional status of the participants, if applicable.	**3,4,5**
Participants	6	a) Cohort study—Give the eligibility criteria, and the sources and methods of selection of participants. Describe methods of follow-up. Case-control study—Give the eligibility criteria, and the sources and methods of case ascertainment and control selection. Give the rationale for the choice of cases and controls. Cross-sectional study—Give the eligibility criteria, and the sources and methods of selection of participants. (b) Cohort study—For matched studies, give matching criteria and number of exposed and unexposed. Case-control study—For matched studies, give matching criteria and the number of controls per case.	**nut-6** Report particular dietary, physiological or nutritional characteristics that were considered when selecting the target population.	**3,4,5**

Item	Item nr	STROBE recommendations	Extension for Nutritional Epidemiology studies (STROBE-nut)	Reported on page #
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable.	**nut-7.1** Clearly define foods, food groups, nutrients, or other food components. **nut-7.2** When using dietary patterns or indices, describe the methods to obtain them and their nutritional properties.	**3,4,5**
Data sources - measurements	8	For each variable of interest, give sources of data and details of methods of assessment (measurement).Describe comparability of assessment methods if there is more than one group.	**nut-8.1** Describe the dietary assessment method(s), e.g., portion size estimation, number of days and items recorded, how it was developed and administered, and how quality was assured. Report if and how supplement intake was assessed. **nut-8.2** Describe and justify food composition data used. Explain the procedure to match food composition with consumption data. Describe the use of conversion factors, if applicable. **nut-8.3** Describe the nutrient requirements, recommendations, or dietary guidelines and the evaluation approach used to compare intake with the dietary reference values, if applicable. **nut-8.4** When using nutritional biomarkers, additionally use the STROBE	**4,5**

Item	Item nr	STROBE recommendations	Extension for Nutritional Epidemiology studies (STROBE-nut)	Reported on page #
			Extension for Molecular Epidemiology (STROBE-ME). Report the type of biomarkers used and their usefulness as dietary exposure markers. **nut-8.5** Describe the assessment of nondietary data (e.g., nutritional status and influencing factors) and timing of the assessment of these variables in relation to dietary assessment. **nut-8.6** Report on the validity of the dietary or nutritional assessment methods and any internal or external validation used in the study, if applicable.	
Bias	9	Describe any efforts to address potential sources of bias.	**nut-9** Report how bias in dietary or nutritional assessment was addressed, e.g., misreporting, changes in habits as a result of being measured, or data imputation from other sources	**4,5**
Study Size	10	Explain how the study size was arrived at.		**3 and 4**
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why.	**nut-11** Explain categorization of dietary/nutritional data (e.g., use of N-tiles and handling of nonconsumers) and	**4 and 5**

Item	Item nr	STROBE recommendations	Extension for Nutritional Epidemiology studies (STROBE-nut)	Reported on page #
			the choice of reference category, if applicable.	
Statistical Methods	12	(a) Describe all statistical methods, including those used to control for confounding (b) Describe any methods used to examine subgroups and interactions. (c) Explain how missing data were addressed. (d) Cohort study—If applicable, explain how loss to follow-up was addressed. Case-control study—If applicable, explain how matching of cases and controls was addressed. Cross-sectional study—If applicable, describe analytical methods taking account of sampling strategy. (e) Describe any sensitivity analyses.	**nut-12.1** Describe any statistical method used to combine dietary or nutritional data, if applicable. **nut-12.2** Describe and justify the method for energy adjustments, intake modeling, and use of weighting factors, if applicable. **nut-12.3** Report any adjustments for measurement error, i.e,. from a validity or calibration study.	**4 and 5**
Results				

Item	Item nr	STROBE recommendations	Extension for Nutritional Epidemiology studies (STROBE-nut)	Reported on page #
Participants	13	(a) Report the numbers of individuals at each stage of the study—e.g., numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analyzed. (b) Give reasons for non-participation at each stage. (c) Consider use of a flow diagram.	**nut-13** Report the number of individuals excluded based on missing, incomplete or implausible dietary/nutritional data.	**6 and 7**
Descriptive data	14	(a) Give characteristics of study participants (e.g., demographic, clinical, social) and information on exposures and potential confounders (b) Indicate the number of participants with missing data for each variable of interest (c) Cohort study—Summarize follow-up time (e.g., average and total amount)	**nut-14** Give the distribution of participant characteristics across the exposure variables if applicable. Specify if food consumption of total population or consumers only were used to obtain results.	**6 and 7**
Outcome data	15	Cohort study—Report numbers of outcome events or summary measures over time.		**7,8**

Item	Item nr	STROBE recommendations	Extension for Nutritional Epidemiology studies (STROBE-nut)	Reported on page #
		Case-control study—Report numbers in each exposure category, or summary measures of exposure. Cross-sectional study—Report numbers of outcome events or summary measures.		
Main results	16	(a) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (e.g., 95% confidence interval). Make clear which confounders were adjusted for and why they were included. (b) Report category boundaries when continuous variables were categorized. (c) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period.	**nut-16** Specify if nutrient intakes are reported with or without inclusion of dietary supplement intake, if applicable.	**6,7,8,9,10**
Other analyses	17	Report other analyses done—e.g., analyses of subgroups and interactions and sensitivity analyses.	**nut-17** Report any sensitivity analysis (e.g., exclusion of misreporters or outliers) and data imputation, if applicable.	**9,10,11 and 12**
Discussion				

Item	Item nr	STROBE recommendations	Extension for Nutritional Epidemiology studies (STROBE-nut)	Reported on page #
Key results	18	Summarize key results with reference to study objectives.		**13,14 and 15**
Limitation	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias.	**nut-19** Describe the main limitations of the data sources and assessment methods used and implications for the interpretation of the findings.	**14,15**
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence.	**nut-20** Report the nutritional relevance of the findings, given the complexity of diet or nutrition as an exposure.	**13 and 14**
Generalizability	21	Discuss the generalizability (external validity) of the study results.		**15**
Other information				
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based.		**15**
Ethics			**nut-22.1** Describe the procedure for consent and study approval from ethics committee(s).	**15**

Item	Item nr	STROBE recommendations	Extension for Nutritional Epidemiology studies (STROBE-nut)	Reported on page #
Supplementary material			**nut-22.2** Provide data collection tools and data as online material or explain how they can be accessed.	**Supplementary file 1**