Food label use and awareness of nutritional information and recommendations among persons with chronic disease

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Purpose

Given the relationship between chronic disease and poor nutritional habits, using food labels and reading dietary recommendations are important for these populations. We explored if persons with chronic conditions utilized nutrient information on food labels and were aware of dietary guidelines.

This study assessed dietary information awareness and utilization use among persons with chronic disease using a nationally-representative sample of the US population.

Methods

- 2005-2006 National Health and Nutrition Examination Survey (NHANES) data from 5,603 respondents aged 17 and older, representing approximately 222 million people, were utilized.
- 17 questions regarding awareness of federal nutrition information and food label use and two 24-hour recall dietary interviews were administered.
- Participants were classified into five disease categories: (1) hypertension; (2) hypercholesterolemia; (3) diabetes/at-risk for diabetes; (4) overweight; and (5) heart disease.
- Factor analyses were conducted to identify groupings of behaviors related to checking, using, and being aware of food labels (Table 1).
- Means and standard errors of the factor analyses are shown in Table 2.
- Multiple linear regression analyses were conducted to determine the relationship between scores of food behaviors and presence of chronic disease, adjusting for age, gender, BMI, marital status, race/ethnicity, education, insurance status, and doctor visits (Tables 3 and 4)

Table 1. Semi-Partial Correlation Coefficients from the Factor Analysis Reference Matrix and Coefficient Alpha for the Three Label Questionnaire Scales

Dietary Behavior Item	Check	Use	Aware
Check total fat on food label	0.69		
Check saturated fat on food label	0.69		
Check calories from fat on food label	0.67		
Check trans fat on food label	0.66		
Check cholesterol on food label	0.62		
Check calories on food label	0.59		
Check carbohydrates on food label	0.57		
Check sodium on food label	0.54		
Check fiber on food label	0.53		
Check sugars on food label	0.52		
Use ingredient list on food label		0.75	
Use health claims on food packages		0.70	
Use serving size info on food label		0.67	
Use nutrition facts panel on food label		0.63	
Heard of food guide pyramid			0.86
Heard about 5-a-day program			0.84
Heard of dietary guidelines			0.83
Coefficient α	0.95	0.88	0.70

Table 2. Means and Standard Errors of the Factor Analysis Dietary Behavior Scales by Chronic Disease

Chronic Disease		No	Yes	p value
Hypertension	Aware	1.33 ± 0.05	1.42 ± 0.05	0.012
	Use	8.95 ± 0.16	9.44 ± 0.23	0.021
	Check	27.34 ± 0.58	27.95 ± 0.65	0.346
Hypercholesterolemia	Aware	1.45 ± 0.07	1.48 ± 0.06	0.418
	Use	9.68 ± 0.31	10.19 ± 0.26	0.005
	Check	29.26 ± 0.88	30.68 ± 0.72	0.014
Diabetes/At-Risk for Diabetes	Aware	1.28 ± 0.05	1.47 ± 0.05	<0.001
	Use	8.98 ± 0.18	9.75 ± 0.22	0.005
	Check	27.31 ± 0.56	29.81 ± 0.64	<0.001
Overweight	Aware	1.28 ± 0.05	1.46 ± 0.06	0.001
	Use	8.93 ± 0.16	9.76 ± 0.21	<0.001
	Check	27.41 ± 0.57	28.47 ± 0.64	0.001
Heart Disease	Aware	1.31 ± 0.05	1.20 ± 0.07	0.136
	Use	9.29 ± 0.17	8.61 ± 0.41	0.043
	Check	28.13 ± 0.54	28.21 ± 1.17	0.923

Results

Multiple Linear Regression (Tables 3 and 4):
- Those with hypertension used more label and package information (p=0.021) and were more aware of national dietary recommendations (p=0.012), compared to those who did not have hypertension.
- Participants with hypercholesterolemia showed more behaviors related to checking for nutrient information on labels (p=0.014) and used more label and package information (p=0.005) in comparison to those with normal cholesterol.
- Subjects with diabetes/at-risk for diabetes and/or who were overweight displayed greater awareness of national dietary recommendations, used more label and package information, and checked for nutrient information on labels, when compared with those without diabetes/not at-risk for diabetes or were of normal weight, respectively (all p values <0.01).

Table 3. Label Use Behavior Scales by Adherence to Dietary Guidelines for Protein, Carbohydrate, Fat, Saturated Fat, and Fiber by hypertension, hypercholesterolemia, and diabetes

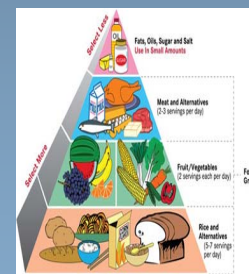| Nutrient	Label Use	Hypertension			Hypercholesterolemia			Diabetes/At-Risk for Diabetes		
		Non-Adherent Mean ± SEM	Adherent Mean ± SEM	p value	Non-Adherent Mean ± SEM	Adherent Mean ± SEM	p value	Non-Adherent Mean ± SEM	Adherent Mean ± SEM	p value
Carbohydrate	Aware	1.34 ± 0.12	1.25 ± 0.12	0.042	1.32 ± 0.06	1.18 ± 0.08	0.088	1.57 ± 0.07	1.42 ± 0.08	0.012
	Use	9.61 ± 0.48	10.00 ± 0.42	0.169	10.16 ± 0.37	10.19 ± 0.49	0.906	9.56 ± 0.36	9.96 ± 0.33	0.980
	Check	30.48 ± 1.64	31.37 ± 1.47	0.280	31.49 ± 1.16	31.52 ± 1.15	0.972	30.96 ± 1.04	32.29 ± 1.33	0.143
Fiber	Aware	1.29 ± 0.12	1.41 ± 0.13	0.221	1.27 ± 0.05	1.48 ± 0.12	0.043	1.48 ± 0.07	1.69 ± 0.11	0.034
	Use	9.67 ± 0.46	10.83 ± 0.70	0.002	10.07 ± 0.40	11.01 ± 0.59	0.039	9.71 ± 0.32	11.02 ± 0.51	0.002
	Check	30.95 ± 1.54	32.27 ± 2.06	0.339	31.64 ± 1.14	33.12 ± 1.38	0.218	31.58 ± 0.96	32.76 ± 1.47	0.311
Protein	Aware	1.34 ± 0.12	1.17 ± 0.13	0.023	1.30 ± 0.06	1.18 ± 0.07	0.110	1.55 ± 0.07	1.44 ± 0.09	0.237
	Use	9.92 ± 0.45	9.22 ± 0.53	0.099	9.75 ± 0.40	10.17 ± 0.49	0.017	10.29 ± 0.31	8.98 ± 0.32	0.000
	Check	31.34 ± 1.60	28.80 ± 1.80	0.072	32.12 ± 1.17	29.60 ± 0.93	0.005	31.90 ± 1.05	29.17 ± 1.33	0.002
Total Fat	Aware	1.34 ± 0.12	1.25 ± 0.13	0.391	1.28 ± 0.07	1.25 ± 0.05	0.647	1.58 ± 0.08	1.43 ± 0.07	0.079
	Use	9.66 ± 0.45	9.97 ± 0.50	0.324	9.39 ± 0.40	13.49 ± 0.46	0.095	9.77 ± 0.37	10.30 ± 0.40	0.239
	Check	30.34 ± 1.60	31.54 ± 1.58	0.097	30.88 ± 1.12	32.56 ± 1.27	0.040	30.75 ± 1.02	32.29 ± 1.57	0.278
Saturated Fat	Aware	1.31 ± 0.13	1.30 ± 0.12	0.778	1.26 ± 0.07	1.25 ± 0.05	0.739	1.57 ± 0.08	1.46 ± 0.06	0.082
	Use	9.43 ± 0.49	10.25 ± 0.46	0.022	9.33 ± 0.43	13.70 ± 0.48	0.018	9.62 ± 0.35	10.47 ± 0.39	0.016
	Check	29.74 ± 1.59	32.22 ± 1.54	0.001	30.28 ± 1.20	33.36 ± 1.26	0.003	30.06 ± 1.24	33.29 ± 0.98	0.002

Table 4. Label Use Behavior Scales by Adherence to Dietary Guidelines for Protein, Carbohydrate, Fat, Saturated Fat, and Fiber by overweight and heart disease

Nutrient	Label Use	Overweight			Heart Disease		
		Non-Adherent Mean ± SEM	Adherent Mean ± SEM	p value	Non-Adherent Mean ± SEM	Adherent Mean ± SEM	p value
Carbohydrate	Aware	1.51 ± 0.07	1.38 ± 0.09	0.103	1.66 ± 0.14	1.43 ± 0.15	0.079
	Use	10.29 ± 0.20	9.97 ± 0.35	0.221	8.77 ± 1.15	9.52 ± 1.03	0.306
	Check	30.51 ± 0.77	29.87 ± 0.66	0.552	27.28 ± 1.70	28.12 ± 1.77	0.596
Fiber	Aware	1.46 ± 0.07	1.51 ± 0.10	0.580	1.52 ± 0.10	1.45 ± 0.21	0.732
	Use	9.99 ± 0.25	10.86 ± 0.40	0.052	9.16 ± 1.07	12.24 ± 1.02	0.000
	Check	30.32 ± 0.65	30.82 ± 0.89	0.481	29.73 ± 1.10	36.17 ± 1.68	0.001
Protein	Aware	1.48 ± 0.07	1.43 ± 0.09	0.392	1.39 ± 0.11	1.53 ± 0.15	0.555
	Use	10.39 ± 0.23	9.59 ± 0.34	0.005	9.18 ± 1.20	8.93 ± 1.14	0.629
	Check	30.93 ± 0.80	28.39 ± 0.78	0.006	28.57 ± 1.64	26.67 ± 2.03	0.254
Total Fat	Aware	1.47 ± 0.08	1.45 ± 0.07	0.741	1.67 ± 0.11	1.49 ± 0.15	0.256
	Use	10.10 ± 0.22	10.33 ± 0.36	0.483	8.40 ± 1.04	10.07 ± 1.11	0.009
	Check	29.99 ± 0.85	30.86 ± 0.73	0.364	26.35 ± 1.74	29.11 ± 1.81	0.014
Saturated Fat	Aware	1.49 ± 0.07	1.43 ± 0.08	0.140	1.60 ± 0.12	1.53 ± 0.13	0.479
	Use	10.03 ± 0.24	10.41 ± 0.28	0.078	8.28 ± 1.07	10.09 ± 1.08	0.013
	Check	29.85 ± 0.74	31.04 ± 0.70	0.054	26.07 ± 1.67	30.11 ± 1.94	0.018

Conclusion

People with chronic disease generally reported better nutrition awareness and food label use and checking behaviors compared to those without chronic disease, but this did not translate into unequivocal better eating behaviors. New strategies are needed to improve actual nutritional behaviors of persons with chronic disease.