Research Article

Parental Nutrition Knowledge Rather Than Nutrition Label Use Is Associated With Adiposity in Children

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ABSTRACT

Objective: Determine how parental nutrition label use, label literacy, and nutrition knowledge may be associated with cardiovascular health in parents and their children.

Design and Setting: Cross-sectional analyses of 2006 data from the *Healthy Heart Project* in Montreal, Canada.

Participants: Among community recruited families, parents were predominantly mothers (n = 127 [80%]; mean age, 45.0 years) and half of their children were female (44%; mean age, 12.5 years).

Main Outcome Measures: Blood pressure, lipids, and weight. Nutrition label use, label literacy, and nutrition knowledge among parents were collected using existing scales.

Analyses: Multivariable linear regression models.

Results: Among parents, nutrition label use was associated with lower total cholesterol (B[SE] = −.53 [.20]; P = .009), lower low-density lipoprotein (B[SE] = −.57 [.21]; P = .007), and lower total cholesterol/high-density lipoprotein cholesterol ratio (B[SE] = −.82 [.30]; P = .008) but was not associated with adiposity. Among children, greater parental nutrition knowledge was associated with lower body mass index percentiles (B[SE] = −3.6 [1.49]; P = .02), lower waist circumference (B[SE] = −1.27 [.55]; P = .02), and lower percent body fat (B[SE] = −1.28 [.47]; P = .008). Parental nutrition label use or nutrition knowledge was not associated with children's lipids.

Conclusions and Implications: Parents with greater nutrition label use had more favorable lipids, but children's lipids were unaffected. Children of parents with greater nutrition knowledge had lower adiposity. Further research on the correlates of label use and health is needed.

Key Words: nutrition labeling, cardiovascular biomarkers, adolescents, children, parents (*J Nutr Educ Behav*. 2016;48:461-467.)

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INTRODUCTION

Nutrition labels are mandatory for all prepackaged foods in the US, Canada, and countries in the European Union.[1-3] Over half of the Canadian adult population report regularly using nutrition labels,[4] and regular label use has been associated with healthier dietary behaviors such as lower fat consumption and increased consumption of healthier alternatives to certain foods (eg, low-fat meats, skim milk).[5-9] Such healthy dietary behaviors have a well-documented link to favorable cardiovascular risk markers, such as lower body mass index (BMI), lower blood lipids, and lower blood pressure.[10-12] In 1 study, for example, it was found that women who adhered to choosing foods with a heart-healthy nutrition label had a decreased intake of saturated and monounsaturated fats and cholesterol, and a 24% reduction in risk of metabolic syndrome.[12]

Research suggests that the link between nutrition label use and dietary quality is attributable to nutrition knowledge, in that nutrition knowledge is higher in label users compared with non–label users.[8,9] However, there is evidence that nutrition label use offers an additional benefit regarding dietary intake beyond the effects of nutrition knowledge. For example, Kim and colleagues[13] found that among nutrition label users, the probability of consuming less total fat, less saturated fat, less cholesterol, and less sodium increased with immediate access to nutrition labels. Such findings emphasize the influence of nutrition label use on daily dietary intake, which

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has potential long-term implications for cardiovascular health.

Throughout childhood, parents have a strong influence on their children's dietary behaviors.[14] Evidence suggests that these habits are often carried forward into adulthood, ultimately affecting the future health of the children.[4] Thus, understanding how parental nutrition knowledge and habits influence children's dietary behaviors and how these influence the parents' own cardiovascular health may have a pivotal role in preventing future disease. Although nutrition label use and healthier dietary behaviors in adults are associated with favorable cardiovascular risk profiles and adiposity measures,[12] notable gaps exist in the literature. For instance, given consumers' reported difficulties in comprehending nutrition labels,[15,16] the existing literature often fails to adjust findings adequately based on label literacy or nutrition knowledge. In addition, although children's diets are moderately correlated with their parents' diets,[17] there is limited evidence regarding the association between parental label use and children's adiposity and cardiovascular health. In fact, studies examining the influence of parental label use on children's health are largely limited to experimental studies assessing the impact of restaurant menu labeling on parental purchasing decisions for their children's meals, and yielded mixed results.[18,19] To the best of the authors' knowledge, no observational study has yet been conducted that examines the association between parental nutrition label use and children's cardiovascular health. Thus, the aim of this study was to investigate whether parental nutrition label use, nutrition label literacy, and nutrition knowledge were associated with cardiovascular biomarkers and adiposity measures in a cross-sectional analysis of parents and their children from Montreal, Canada.

METHODS

Participants were parent–child dyads (n = 134) from the 2006 baseline measurement of the *Healthy Heart Project*, a cohort study examining early cardiovascular risk factors among youth, conducted at Concordia University in Montreal, Canada. Parents and youth aged 10–15 years without serious psychopathology or cardiovascular events were recruited from local schools and neighborhoods in Montreal using flyers posted in the community (eg, library) and bookmarks distributed with permission in local schools. Informed consent and assent were obtained from parents and youth, respectively. Participants were financially compensated for their time. The study was approved by the Research Ethics Unit at Concordia University (Ethics Approval No. UH2005-077). Participants with missing data for any of the nutrition label use questions (n = 7) were excluded from analyses.

Measures

All nutrition measures were collected by parent report, as outlined in the following sections. The parent who knew the child best completed a parent-report questionnaire, which included questions on their own use of nutrition labels, nutrition label literacy, nutrition knowledge, and attitudes regarding their dietary habits, as well as food screeners (for both themselves and their child).

Nutrition label use. Questions assessing the frequency of reading nutrition labels and use of labels for purchasing and eating choices were adapted from existing instruments.[5,7,8] Using a 5-point Likert scale, parents indicated the extent to which they make food purchasing decisions based on the food label, make eating choices based on the food label, and read the food label. Nutrition label use reported as often or almost always for all 3 questions (purchasing, eating, and reading) was recoded into nutrition label users. Label use reported as never, almost never, or sometimes was recoded into non–label users. Internal consistency for this measure was high (Cronbach $\alpha = .90$).

Nutrition label literacy. Comprehension of nutrition labels was assessed using a nutrition label literacy questionnaire released by the US Food and Drug Administration (survey instrument available upon request to the author). Parents answered 20 questions covering 4 types of label literacy pertaining to nutrition facts labels: (1) basic nutrition label information (eg, How many calories are in a single serving?), (2) sources of calories (eg, How many calories would you get from saturated fat if you ate 1 serving of this food?), (3) ability to convert nutrition information from a single serving to multiple servings (eg, If you ate 2 portions of this food, how many grams of fiber would you consume?), and (4) comparison of 2 labels (eg, Which of these 2 products has more calcium?). Correct answers (binary coded 0/1) were summed to yield a total correct score (out of a possible 20) and are reported as percentages. This questionnaire was primarily used as a knowledge-building resource from the US Food and Drug Administration; internal consistency was high (Cronbach $\alpha = .82$) in this sample.

Nutrition knowledge. Nutrition knowledge was assessed using the validated 10-item Choosing Everyday Foods scale from the Nutrition Survey of Parmenter and Wardle.[20] Questions were adapted for the Canadian context and assessed parental knowledge in selecting foods to meet specific nutrition requirements. Correct answers (binary coded 0/1) were summed to yield a total correct score (out of a possible 10) and are reported as percentages. Original reliability coefficients were reportedly moderate ($r = .76$ for internal consistency; $r = .87$ for test-retest reliability).[20]

Covariates. Self-rated perceptions of eating habits were assessed based on the theoretical Stages of Change model of Prochaska and DiClemente.[21] Questions were adapted from the validated Readiness to Change Questionnaire in accordance with the literature.[22,23] Parents who reported having tried to eat healthy or having had healthy eating habits for at least the past month in response to the question, What are your plans for your eating habits over the next 6 months? were labeled as having healthy diet habits for at least the last month.

Consumption of fruits and vegetables in parents and youth were assessed with food screeners, adapted from various sources on dietary intake.[24-26] Parents and youth who consumed 100% fruit juice and/or fruit more