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The Impact of Menu Labeling on Fast-Food Purchases for Children and Parents

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Abstract

Background—Nutrition labeling of menus has been promoted as a means for helping consumers make healthier food choices at restaurants. As part of national health reform, chain restaurants will be required to post nutrition information at point-of-purchase, but more evidence regarding the impact of these regulations, particularly in children, is needed.

Purpose—To determine whether nutrition labeling on restaurant menus results in a lower number of calories purchased by children and their parents.

Methods—A prospective cohort study compared restaurant receipts of those aged 6–11 years and their parents before and after a menu-labeling regulation in Seattle/King County (S/KC) (*n*=75), with those from a comparison sample in nonregulated San Diego County (SDC) (*n*=58). Data were collected in 2008 and 2009 and analyzed in 2010.

Results—In S/KC, there was a significant increase from pre- to post-regulation (44% vs 87%) in parents seeing nutrition information, with no change in SDC (40% vs 34%). Average calories purchased for children did not change in either county (823 vs 822 in S/KC; 984 vs 949 in SDC). There was an approximately 100-calorie decrease for the parents postregulation in both counties (823 vs 720 in S/KC; 895 vs 789 in SDC), but no difference between counties.

Conclusions—A restaurant menu-labeling regulation increased parent's nutrition information awareness, but did not decrease calories purchased for either children or parents.

Background

People consume more fat and calories when eating at restaurants,[1–5] underestimate caloric content of restaurant foods,[6, 7] and generally do not have ready access to nutrition

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information at the time of purchase. [8] Nutrition labeling of menus could help consumers make healthier choices at restaurants [9–13] but more information on its effectiveness is needed as the national health reform mandate for menu labeling is implemented. Most existing menu-labeling studies have focused on adults and have equivocal results [14–20] and few assessed its impact on children.

A prospective cohort study was conducted to understand families' food purchasing before and after a menu-labeling regulation in Seattle/King County, WA (S/KC)[24] versus a comparison group in San Diego County, CA (SDC). It was hypothesized that menu labeling would result in lower-calorie purchases in the regulated versus unregulated county.

Methods

Sampling

Participants were recruited from the Neighborhood Impact on Kids (NIK) Study, an observational cohort study of those aged 6–11 years and their parents in S/KC and SDC. English-speaking parents indicating their child ate at a fast-food chain subject to the S/KC menu-labeling regulation were eligible. A sample size of 75 child–parent pairs in each county has 80% power to detect a 100-calorie difference in calories purchased across counties with a two-sided *t*-test (SD=220, alpha=0.05).[25–27]

One hundred twenty eight S/KC families and 123 SDC families were invited to participate, 83 in S/KC and 62 in SD enrolled and 75 in S/KC and 58 in SDC completed the study. This study was approved by the Seattle Children's IRB.

Data Collection

Participants were enrolled October–December 2008 and sent a $10 gift card to a study-eligible restaurant chain that they had reported they visit with their child. Parents were instructed to go to the restaurant with their child before January 1, 2009 (the date of labeling implementation in S/KC), purchase typical meals for themselves and their child, and mail back the receipt. Via phone survey, receipt items were clarified and information on meal selection[28] and nutrition information awareness collected. Sociodemographics and anthropometrics were from the NIK study. The above process was repeated postregulation March –June 2009. All families returned to the same restaurant chain.

Analysis

Data analysis occurred in 2010. Main outcome measures were total calories purchased for each parent and child before and after the regulation. Calorie information was from the restaurant's website pre- and post-regulation. If items had been shared, each individual was ascribed half the calories.

S/KC and SDC participant characteristics were compared using chi-square and *t*-tests. Unadjusted phone survey responses were compared using the Stuart-Maxwell test. Pre–post calorie comparisons used paired *t*-tests. Multivariable regression and generalized estimating equations (GEE) were used to estimate the effect of nutrition labeling on calories purchased and other outcomes. Time-by-site interactions were tested and final models on calorie data were adjusted for parent's gender, race and household income. Analyses stratified by child gender and weight status (child overweight/obese BMI ≥85th %; parent overweight/obese BMI ≥25) were conducted.

Results

There were no significant differences in demographics or weight status among the eligible, enrolled and study completers. Children averaged age 8.8 years and 49% were girls. Over 80% of the parents were mothers and 70% had a college degree or higher level of education. Sixty-four percent of parents and 25% of children were overweight/obese. More families had higher incomes in S/KC (70% vs 39% >$90,000) and there were more Hispanics in SDC (14% vs 1%), the only between-county differences.

In S/KC, 43% of participants went to a burger restaurant, 17% to a Mexican restaurant and 40% to a sandwich restaurant. In SDC, respective percentages were 49%, 15%, and 36%. The mean total price for both the parent and child's meals pre-regulation was $10.13 (53% ≤ $10) and postregulation was $8.93 (69% were ≤ $10).

In S/KC but not SDC, there was a significant increase in parents who reported seeing nutrition information. (Table 1) Postregulation, 68% of S/KC participants who saw nutrition information reported seeing it on the menu board, compared to only 6% in SDC.

The average calories purchased for children did not change from pre- to post-regulation in either county in unadjusted and adjusted models. (Table 2) Parents decreased calories by approximately 100 from pre- to post-regulation in both counties regardless of whether or not they saw nutrition information in unadjusted and adjusted models. For parents and children, the pre–post changes in calories between S/KC and SDC were not significantly different. Mean calories for overweight parents decreased significantly from pre- to post-regulation, but this was not significantly different between counties.

Discussion

Implementation of a menu-labeling regulation in S/KC resulted in parents seeing the labels, but no reduction in higher-calorie food purchases. Findings suggest a positive impact of menu labeling in increasing consumer awareness that did not translate into a lower number of calories purchased. Elbel et al. also found that immediately after implementation, the NYC menu-labeling regulation did not influence adolescent food choices or parent food choices for children.[29] The lack of change in calories could be the result of the fact that most children in the current sample chose their meals, and most continued to choose the same items before and after labeling was implemented. Children may not have the ability or interest in using nutrition information to inform their choices. Taste continues to be the predominant factor in meal choice.[28, 30] Thus, although nutrition information was seen more and reportedly influenced more meal choices postregulation in S/KC, only 13% of S/KC parents who saw it said that it influenced the choice for their child.

The equivocal results for the parents were consistent with a meta-analysis of menu-labeling studies, wherein five of six studies found that calorie information weakly or inconsistently influenced food choices.[15] The overall decrease in parent's total calories, particularly overweight parents in both counties, may be the result of a testing effect, a secular trend, or other reasons.

This study has several limitations. The postregulation data collection timeframe, which was only months after the regulation may have been too short to see substantial changes. The sample sizes were small and the power insufficient to detect effect sizes that may be meaningful from a public health perspective. While SDC did not have a menu-labeling regulation, a requirement to make nutrition brochures available went into effect in 2009. The level of nutrition information awareness was generally high among participants in this study, even at baseline in both counties, which may be related to being in a cohort and could have

made it more difficult to see an effect from the menu labeling. This study did not capture those who decided to avoid fast food or alter their consumption later in the day in response to nutritional awareness from menu labeling. Finally, the sample may not represent the effects of such an intervention on more diverse populations.

Study strengths included pre- and post-regulation data from families for whom there was demographic and anthropometric information. Findings suggest a need to explore the influence of menu labeling on overweight/obese individuals.

This study is among the first on the in vivo impact of menu labeling on food purchasing for children. As menu labeling becomes implemented nationally, more evidence among larger samples over longer time periods, and further characterization of individual or environmental factors that affect restaurant menu-labeling efficacy are needed.

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Table 1

Factors influencing fast-food meal selection for children and parents

Category	King County			San Diego			Time × site p(CI) [b]	Time × site p-value
	PRE *n* (%)	POST *n* (%)	p-value	PRE *n* (%)	POST *n* (%)	p-value		
MEAL SELECTION	n^a=75	n^a=75		n^a=58	n^a=58			
Person selecting meal for child						0.44		
Child alone	61 (84)	47 (68)	**0.008**	43 (74)	39 (70)		1.8 (.7, 4.5)	0.17
Parent involved	12 (16)	22 (32)		15 (26)	17 (30)			
Meal purchased for child was a “usual” one	71 (96)	62 (87)	0.13	47 (81)	48 (86)	0.53	0.2 (0.1, 1)	0.06
Meal purchased for parent was a “usual” one	50 (72)	52 (78)	0.53	44 (77)	43 (81)	0.44	1 (.3, 3)	0.97
Parent saw nutrition information that day	32 (44)	62 (87)	**<0.001**	23 (40)	19 (34)	0.62	11 (4, 27)	**<0.001**
Importance of factors in child food/beverage choice (1=not important to 5=very important)			NS for all except			NS for all		NS for all
TASTE	4.4	4.4		4.4	4.6			
NUTRITION	3.3	3.5		3.3	3.4			
COST	2.8	3.4	**<0.001**	3.4	3.7			
CONVENIENCE	3.6	3.8		3.6	3.8			
WEIGHT CONTROL	2.1	2.0		2.3	1.9			
TOY OFFERED	1.7	1.5		1.7	1.6			
PROMOTION	1.9	1.9		2.2	2.1			
Importance of factors in parent food/beverage choice (1=not important to 5=very important)			NS for all			NS for all		NS for all
TASTE	4.6	4.3		4.6	4.5			
NUTRITION	3.6	3.9		3.5	3.5			
COST	3.2	3.4		3.9	3.7			
CONVENIENCE	3.6	3.9		3.8	3.7			
WEIGHT CONTROL	2.8	2.8		2.8	2.7			
PROMOTION	2.0	2.1		2.7	2.5			

Category	King County			San Diego			Time × site p(CI) [b]	Time × site p-value
	PRE *n* (%)	POST *n* (%)	p-value	PRE *n* (%)	POST *n* (%)	p-value		
THOSE THAT SAW NUTRITION INFORMATION	*n*=32[a]	*n*=62[a]		*n*=23[a]	*n*=19[a]			
Nutrition information was posted on menu board	7 (21)	43 (68)	**0.002**	6 (25)	1 (6)	0.08	45 (5, 493)	**0.001**
Nutrition information influenced meal choice for child	2 (6)	8 (13)	**<0.001**	4 (17)	3 (17)	0.30	2[c] (.3, 16)	0.39
Nutrition information influenced meal choice for parent	11 (33)	27 (45)	**<0.001**	4 (17)	5 (26)	0.32	1.3 (.4, 5)	0.59

[a] Missing data on 0–6 participants depending on item

[b] Represents the ratio between the pre–post difference in S/KC and the pre–post difference in SDC

Table 2

Mean calories purchased for children and parents by county and weight status

	King County				San Diego County				Time × site β [h] (CI)	Time × site p-value
	PRE	POST	95% CI	p-value[g]	PRE	POST	95% CI	p-value[g]		
All children[a]	823	822	−77,79	0.98	984	949	−65,133	0.49	34 (−90, 159)	0.53
Non-overweight children[b]	782	801	−120, 82	0.71	984	970	−104, 131	0.81	33 (−116, 181)	0.66
Overweight/Obese children[c]	936	880	−50, 163	0.28	981	877	−96, 305	0.30	48 (−137, 233)	0.61
All parents[d]	823	720	18, 186	**0.02**	895	789	12,201	**0.03**	5 (−119,129)	0.88
Non-overweight parents[e]	780	692	−59, 235	0.23	860	838	−135, 180	0.77	−66 (−266, 35)	0.52
Overweight/Obese parents[f]	848	737	5, 217	**0.04**	912	765	27, 267	**0.02**	46 (−106, 197)	0.56

[a] Sample sizes: S/KC = 75, SDC = 58

[b] Sample sizes: S/KC = 55, SDC = 45

[c] Sample sizes: S/KC = 20, SDC = 13. Overweight/obese for children was defined as a BMI ≥85th percentile for age and gender.

[d] Sample sizes:, S/KC = 66, SDC = 55

[e] Sample sizes: S/KC = 24, SDC = 18

[f] Sample sizes: S/KC = 42, SDC = 37. Overweight/obese for parents was defined as a BMI≥25.

[g] p-value from unadjusted analyses comparing within-subjects difference in pre- and post-regulation calories purchased

[h] Represents the difference in pre–post differences in S/KC compared to SDC. The beta coefficients differ from the absolute difference in differences across counties because these are from a model adjusted for parent's gender, race and household income.