

Voluntary healthier kids' meals policies: Are caregivers choosing kids' meals and healthier items for their child?

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Summary

Background: Children's fast-food consumption increases risks for obesity and other diet-related diseases. To address concerns, from 2010 to 2016 U.S. fast-food restaurants implemented voluntary policies to offer healthier drinks and/or sides with kids' meals.

Objectives: Examine the effectiveness of voluntary kids' meal policies.

Methods: Online repeated cross-sectional survey (2010, 2013, 2016) of U.S. caregivers (N = 2093) who purchased fast-food for their child (2-11 years) in the past week. Logistic regression examined associations between healthier kids' meal policy implementation and caregivers' purchases of kids' meals and selection of healthier sides and drinks. Separate models investigated caregivers' attitudes about McDonald's kids' meal items.

Results: Overall, 55% of caregivers reported choosing a kids' meal for their child, and approximately one-half of those caregivers selected a healthier drink and/or side. Healthier kids' meal policy implementation was associated with increased selection of healthier sides, but not healthier drinks or choice of kids' meals over higher-calorie menu items. Child's age, caregiver gender and visit frequency were significant in most models. Caregivers' perceptions that their child(ren) like healthier drinks and sides were positively associated with selection of those items.

Conclusions: Existing healthier kids' meal policies may not improve children's fast-food consumption. Public health initiatives should examine more effective alternatives.

KEYWORDS

children, fast-food choices, fast-food restaurants, food policy, healthier kids' meals

1 | INTRODUCTION

Fast-food consumption contributes to excess calories and poor diet quality among children,¹⁻⁴ and consumption has increased substantially in high-income countries, including the United States.⁴ Approximately one-third of U.S. children consume fast food on a given day.^{5,6} On days that children eat fast food, they consume 126 additional calories, and greater total fat, saturated fat and sugar.¹ Consumption of sugary drinks at fast-food restaurants is especially problematic, contributing an additional 179 cal to fast-food meals compared to meals

without these drinks.⁷ Given the prevalence of obesity and other diet-related disease among U.S. children,⁸ frequent fast-food consumption raises concerns. Therefore, identifying opportunities to improve the nutritional quality of fast-food meals consumed by children presents a potentially effective public health initiative. One study showed that deregulation in higher-income countries, including fewer trade restrictions and agricultural policies, has contributed to the spread of fast-food restaurants and higher rates of BMI.⁴

Fast-food restaurants have responded to public health concerns by improving the nutrition quality of some kids' meal items. Kids'

meals typically include a combination of a main dish, a side and a drink in smaller-sized portions with a toy or other promotional item that appeals to children. Among the four largest U.S. fast-food restaurants, McDonald's, Burger King and Wendy's have offered at least one healthier drink (eg, low-fat plain or chocolate milk, 100% juice, bottled water) and side (eg, apple slices) with their kids' meals since 2010,⁹ while Subway has only listed healthier sides and drinks with its kids' meals.¹⁰ More recently, some U.S. restaurants have promised to promote healthier kids' meal items (see Figure S1). In 2011, McDonald's started automatically including a healthier side (apple slices) with its kids' meals, in addition to a reduced-sized portion of French fries.¹¹ From September 2013 to 2015, McDonald's, Burger King and Wendy's implemented voluntary policies to exclusively list healthier drinks (and remove fountain drinks) on kids' meal menu boards.¹²⁻¹⁴

The U.S. local municipalities and states have also enacted policies to regulate restaurant kids' meals. The earliest government policies passed in 2010 and established minimum nutrition standards for kids' meals that come with a toy.¹⁵ Since 2015, three states and numerous municipalities have implemented policies that require restaurants to offer only healthier drinks as the default options with kids' meals.¹⁶ These policies differ in their definition of healthier drinks (which typically include water, milk and 100% juice), and most prohibit listing sugary drinks as a kids' meal option on restaurant menus but allow consumers to continue to request sugary drinks with kids' meals. Yet more recent government policy proposals to require minimum nutrition standards for kids' meals have not passed.¹⁷

1.1 | Questions about the impact of healthier kids' meal policies

Despite these improvements in individual kids' meal menu items, the majority of kids' meal combinations available at fast-food restaurants continue to exceed dietary recommendations for percentage of calories from total fat, saturated fat and sodium.¹⁸⁻²¹ Moreover, most policies have not removed unhealthy items from kids' meal menus. For example, with both voluntary healthier kids' meal drink policies and government policies, sugary drinks are still available with kids' meals upon request. In addition, McDonald's kids' meals continue to include a small portion of French fries, as well as a healthier side, while some caregivers report receiving soda, chips and/or cookies with Subway kids' meals, even though they are not listed on the restaurant's kids' meal menu.²² Furthermore, caregivers often order items from the regular menu for their child, which typically come in larger portion sizes with more calories than kids' meal items.²³ Fewer than one-half of caregivers (46%) who visited one of the four largest fast-food chains in 2016 reported purchasing only a kids' meal for their child, another 20% purchased a kids' meal plus another menu item (such as a dessert), and the remainder purchased other types of items (eg, dollar menu items).

Recent trends in fast-food purchases and children's consumption raise additional concerns. From 2010 to 2016, the proportion of caregivers who reported purchasing a kids' meal plus another item

increased significantly.²³ In the same study, the percentage of caregivers who reported purchasing fast food weekly or more often for their child increased significantly for most restaurants from 2013 to 2016. In addition, data from the National Health and Nutrition Examination Survey (NHANES) demonstrate an increase in mean percentage of calories from fast food consumed by children (2-11 years), from 8.5% in 2009-2010 to 11.5% in 2017-2018, reversing a substantial decline from 2003-2004 to 2009-2010.²⁴

Therefore, it is uncertain whether fast-food restaurants' voluntary kids' meal policies positively impact children's fast-food consumption. One evaluation of McDonald's pledge to remove fountain drinks from kids' meal menus showed a decline in customers who selected fountain drinks (ie, soda and other sugary drinks) with kids' meal orders, from 63% in 2013 to 48% in 2018.²⁵ However, approximately one-half of kids' meal orders continued to include a fountain drink 5 years following policy implementation.¹⁴ The effects of government healthy default beverage policies are also unclear as many prohibit sugary drinks from being listed on menu boards as a kids' meal option but allow customers to continue to order sugary drinks with kids' meals. An evaluation of these default beverage regulations in California and Delaware found that only 1% of restaurant staff verbally offered a healthier beverage with kids' meal orders.¹⁶ Despite their growing prevalence, published research has yet to examine the impact of government healthy default beverage policies.

Therefore, evaluations of healthier kids' meal policies, including voluntary and government policies, must examine whether such policies affect total fast-food purchases for children, in addition to their effect on selection of healthier drinks or sides with kids' meal purchases. Furthermore, how caregivers decide what items to purchase for their children at fast-food restaurants, including the relative importance of menu item healthfulness vs child preferences, is relatively unexplored in the literature. One study found that children consumed healthier fast-food meals (fewer calories and less sodium and fat) when caregivers ordered alone than when their child participated in the decision.²⁶ However, 80 to 90% of children ages 4 to 12 participated in the decision, and caregivers were more involved in fast-food ordering decisions for younger children.

1.2 | The present study

This study examined the potential for restaurants' voluntary healthier kids' meal drink and side policies to improve the healthfulness of fast-food purchases for children. It expands upon previously published findings from a large survey of caregivers that showed a decline in the proportion of caregivers who purchased a kids' meal from 2010 to 2016 and no increase in selection of healthier drinks or sides by caregivers who had purchased a kids' meal.²³ In this study, we utilized these survey data to examine associations between individual factors (including child's age, caregiver education and race/ethnicity and frequency of fast-food purchases) and caregivers' purchases of kids' meals for their child. For those who purchased a kids' meal, we also measured associations with selection of healthier drinks and sides.

The analysis utilized variation in the implementation of voluntary healthier kids' meal policies by the top-four fast-food restaurant chains, which occurred during the time period examined, to assess whether these policies were associated with increased purchases of kids' meals and/or the selection of healthier kids' meal sides and drinks, after controlling for individual factors and trends across restaurants and survey years. These findings will help inform advocates and policymakers about the potential efficacy of ongoing voluntary healthier kids' meal policies at restaurants. They may also help determine whether government policy proposals to require healthier drinks as the default option with kids' meals have the potential to improve the healthfulness of children's fast-food consumption.

2 | METHODS

An online repeated cross-sectional survey of caregivers assessed frequency of visits to fast-food restaurants with their child (ages 2-11) in 2010, 2013 and 2016. Caregivers also provided detailed information about the specific menu items purchased in a recent fast-food restaurant visit with their child. Logistic regression models estimated the likelihood of caregivers purchasing a kids' meal during that visit, their selection of a healthier side or drink if they ordered a kids' meal, and associations with their perceptions of the healthfulness and their child's preferences for kids' meal items if they visited McDonald's. The study was determined to be exempt from continuing IRB review by the University's Institutional Review Board in 2016 (approval reference number: #X16-055) and the Principal Investigator's previous University's Institution Review Board in 2010 as responses were anonymous and utilized survey procedures that did not pose a risk to participants.

2.1 | Procedures

The online survey was conducted using the same survey and procedures in September 2010, July 2013 and July 2016. An online survey panel company (Survey Sampling International [SSI]) recruited a non-probability sample of approximately 800 caregivers with at least one child (2-11y) each year, including augments to obtain at least 100 Black and 100 Hispanic caregivers each year for comparison purposes. SSI panel members do not receive compensation for completing individual surveys, but they receive compensation for being active panellists, such as charitable donations, monetary rewards and/or points for overall participation. Details on panel recruitment and sampling procedures are published elsewhere.²³ Of the panel members that SSI invited to answer the survey, participation rates were 89% in 2010, 90% in 2013 and 97% in 2016.

2.2 | Measures

Survey participants indicated whether they had purchased lunch or dinner from McDonald's, Burger King, Subway, and/or Wendy's for one or more of their 2- to 11-year-old children within the past week.

They also indicated how often they purchased food for their child from a longer list of top fast-food restaurants (ranging from "never" to "every day"). Caregivers who reported that they had purchased from one of the top-four restaurants also provided detailed information about their visit to one of those restaurants in the past week. If they reported purchasing from more than one restaurant in the past week, they were randomly assigned to answer questions about one restaurant. If they purchased food for more than one 2- to 11-year-old child, they were asked to answer questions about the child with the most recent birthday. Questions about the visit included what type of menu items they ordered (eg, kids' meal, dollar/value menu). Caregivers who ordered from the kids' meal menu then viewed a list of individual kids' meal items available from that restaurant chain (including main dishes, drinks and sides listed on the restaurants' websites in the survey year) and asked to select the specific items they ordered for their child, with the option to write in additional items not listed. Caregivers who answered questions about a visit to McDonald's also provided information about their child(ren)'s preferences for each of the available kids' meal drinks and sides (1 = strongly dislike to 9 = strongly like) and how healthy they believe these items to be (1 = very unhealthy to 9 = very healthy). Finally, caregivers provided caregiver and child demographic information.

Researchers utilized a previous study that collected kids' meal menu item information posted on restaurant websites in 2010, 2013 and 2016, and they identified drink and side items that restaurants identified as healthier options.²² Healthier drinks included 100% juice, juice drinks with no sugar added, plain water and low-fat milk (plain and flavoured). Healthier sides included fresh fruit, applesauce and yogurt. Previous research also documented restaurants' public statements about their policies to offer healthier drinks and/or sides as the default kids' meal options during the same time period (see Figure S1).²² For each restaurant chain and year, a dichotomous variable identified whether the restaurant had a policy in place to offer healthier drinks and/or sides as the default kids' meal option that year (see Table S1). Although healthier kids' meal default policies varied by restaurant and year, all four restaurant chains listed at least one healthier drink and one healthier side option on the kids' meal menus posted on their websites in all 3 years.

For each meal reported by caregivers, researchers coded whether the caregiver ordered a kids' meal and, if so, whether they selected one of the healthier kids' meal drinks and sides and/or another item (ie, unhealthy drinks or sides). Caregivers could select more than one side with a kids' meal, consistent with some restaurants' practices. Caregivers' reported frequency of visits with their child to that restaurant were coded as (a) once a month or less, (b) a few times a month but less than once a week and (c) more than once a week. For caregivers who reported on a visit to McDonald's, researchers calculated the means of their child(ren)'s preferences for the healthier drinks, healthier sides and unhealthy sides available with kids' meals. Caregivers' perceptions of the healthfulness of healthier drinks, healthier sides and unhealthy sides were calculated in the same way. Of note, McDonald's kids' meal menu did not list any unhealthy drinks in 2016, so questions about children's preferences and perceived healthfulness

of unhealthy drinks were not included in the survey in 2016 or in this analysis.

2.3 | Statistical analysis

Logistic regression models assessed whether restaurants' policies to offer healthier drinks and/or sides as the default with kids' meals were

associated with caregivers' reported purchases of (i) a kids' meal, and if they purchased a kids' meal, selection of a (ii) healthier drink and (iii) healthier side. The model included a dummy variable to indicate if the restaurant had a healthier kids' meal policy in the year of the purchase. A stepwise regression procedure was used to identify significant demographic variables. The final model controlled for caregivers' gender, education, and race/ethnicity and child's age, coded dichotomously (2-5 and 6-11 years). Caregiver age and overweight

TABLE 1 Caregiver sample characteristics

	Visited one of the top-four restaurants ^a		Purchased a kids' meal	
	Freq	Percent (%)	Freq	Percent (%)
Total	2093	100	1152	100
Age of child				
2-5 y	703	41	526	46
6-11 y	1017	59	626	54
Caregiver's gender				
Female	1010	61	651	59
Male	635	39	455	41
Caregiver's race/Ethnicity				
Non-Hispanic White	890	56	612	55
Non-Hispanic Black	350	20	224	20
Hispanic only	301	16	198	18
Other	59	4	44	4
Mixed race	43	3	26	2
Caregiver's education				
High school degree or less	340	21	221	20
Some college or 2-y college degree	635	39	430	39
4-y college degree or higher	668	41	453	41
Restaurant visited				
McDonald's	862	50	643	56
Subway	293	17	162	14
Burger King	315	18	189	16
Wendy's	250	15	158	14
Year of visit				
2010	578	34	388	34
2013	576	33	394	34
2016	566	33	370	32
Selection of a healthier kids' meal item				
Healthier drink	-	-	648	56
Healthier side	-	-	570	50
Frequency of fast-food visits				
Once a month or less	262	16	141	13
A few times a month	748	45	492	44
1-2 times a week	432	26	315	28
3+ times a week	230	14	178	16

Note: All percentages are unweighted and do not add up to 100% due to some non-responses.

^aIncludes all caregivers who reported visiting McDonald's, Burger King, Wendy's, and/or Subway in the past week and purchasing lunch or dinner for their child (2-11 y old).

indicator were non-significant. The model also controlled for caregivers' reported frequency of visits to that restaurant with their child. Finally, dummy variables for each year and restaurant controlled for other time-dependent factors and non-observable characteristics of restaurants that could have influenced caregivers' reported purchases. A second set of logistic regression models were specified for the subsample of caregivers who reported on a visit to McDonald's. In addition to the variables specified in the full sample models, these models included caregivers' perception of their child(ren)'s preferences for healthier drinks and sides and unhealthy sides available with McDonald's kids' meals and their perceptions of the healthfulness of these items. All analyses were performed with Stata statistical software version 15.1 (Stata Corp, College Station, TX).

3 | RESULTS

Researchers collected 2774 survey responses and analysed 2477 caregivers with at least one child (2-11y) in 2010, 2013 and 2016. Of

the total caregivers surveyed (N = 2477), 84% (n = 2093) reported purchasing lunch or dinner for their 2- to 11-year-old child in the past week from at least one of the top-four fast-food restaurants examined in this analysis. Of those caregivers, 55% (n = 1152) reported purchasing a kids' meal for their child (Table 1). One-half of caregivers who reported visiting any of the restaurants answered questions about a visit to McDonald's (n = 862). The sample was diverse in race, ethnicity and education, including 20% non-Hispanic Black participants, 16% Hispanic and approximately 60% with less than a 4-year college degree. Across all 3 years, 50% of caregivers who purchased a kids' meal reported selecting a healthier side for their child, while 56% reported selecting a healthier drink. Bivariate outcome comparisons, including differences between caregivers who visited each of the four restaurants and differences by year have been previously reported.²³

In the models reporting visits to all four restaurants, implementation of a healthier kids' meal policy was not associated with increased odds of caregivers reporting that they purchased a kids' meal or selected a healthier drink with a kids' meal, but it was associated with their selection of a healthier kids' meal side (Table 2). The likelihood of

TABLE 2 Associations between individual and restaurant characteristics and caregivers' kids' meal purchases

Independent variables	Purchased a kids' meal ^a (n = 2477)		Selected a healthier kids' meal ^b drink (n = 1102)		Selected a healthier kids' meal ^b side (n = 1102)	
	Odds ratio (95% CI)	P value	Odds ratio (95% CI)	P value	Odds ratio (95% CI)	P value
Healthier kids' meal policy in place	0.73 (0.46-1.18)	.201	0.75 (0.33-1.72)	.503	14.01 (7.45-26.33)	<.001
Caregiver gender (Reference = Male)						
Female	0.69 (0.54-0.88)	.003	1.32 (1.00-1.74)	.048	1.66 (1.21-2.28)	.002
Caregiver education (Reference = High school degree or less)						
Some college or 2 -y college	1.24 (0.92-1.66)	.160	0.95 (0.68-1.34)	.773	1.22 (0.83-1.80)	.302
4-y college degree or higher	1.18 (0.87-1.60)	.292	0.95 (0.66-1.37)	.803	1.30 (0.86-1.94)	.209
Caregiver race/Ethnicity (Reference = non-Hispanic White)						
Non-Hispanic Black	0.75 (0.57-0.98)	.039	1.01 (0.73-1.39)	.963	1.01 (0.70-1.45)	.960
Hispanic only	0.88 (0.66-1.18)	.394	1.07 (0.76-1.51)	.681	1.31 (0.90-1.90)	.163
Mixed and other races	0.93 (0.59-1.48)	.767	1.75 (1.01-3.03)	.044	1.57 (0.86-2.87)	.139
Child age (Reference = 6-11 y)						
2-5 y	2.03 (1.61-2.57)	<.001	1.90 (1.46-2.46)	<.001	1.60 (1.19-2.15)	.002
Frequency of restaurant visits (Reference = once a month or less)						
A few times a month	1.54 (1.14-2.09)	0.005	1.06 (0.72-1.59)	.757	1.60 (1.02-2.52)	.040
1+ times a week	2.40 (1.75-3.30)	<0.001	1.25 (0.83-1.87)	.281	1.88 (1.19-2.97)	.007
Restaurant (Reference = Subway)						
McDonald's	2.26 (1.61-3.17)	<.001	0.34 (0.17-0.67)	.002	1.46 (0.92-2.32)	.104
Burger King	0.89 (0.49-1.60)	.688	0.28 (0.14-0.58)	.001	1.78 (0.81-3.90)	.148
Wendy's	1.02 (0.56-1.86)	.938	0.26 (0.13-0.54)	<.001	2.44 (1.11-5.38)	.027
Year (Reference = 2010)						
2013	1.32 (0.90-1.95)	.161	0.93 (0.67-1.30)	.684	1.39 (0.80-2.42)	.244
2016	1.13 (0.77-1.64)	.539	1.35 (0.60-3.05)	.467	0.60 (0.34-1.04)	.070
Constant	0.77 (0.43-1.37)	.377	2.12 (0.89-5.01)	.088	0.06 (0.03-0.14)	<.001

Note: Boldface indicates statistical significance at 95% confidence level.

^aIncludes all caregivers who had visited McDonald's, Burger King, Wendy's, or Subway in the past week with their child.

^bIncludes caregivers who purchased a kids' meal for their child in that visit.

purchasing a kids' meal was associated with individual characteristics, including age of child (caregivers were almost twice as likely to purchase a kids' meal for a younger child), frequency of visits (odds increased with visit frequency) and caregiver gender (mothers were less likely to purchase kids' meals). In addition, White non-Hispanic caregivers were more likely to purchase a kids' meals compared to Black non-Hispanic, but not Hispanic caregivers. Caregivers were also almost twice as likely to purchase a kids' meal from McDonald's than from Subway, but the odds of purchasing a kids' meal did not differ between other restaurants and across years after controlling for other factors.

Caregivers who purchased a kids' meal at one of the top-four restaurants were also significantly more likely to select healthier drinks ($P < .001$) and sides ($P = .002$) for a younger child than for a child 6-11 years, and mothers who purchased a kids' meal were more likely to select healthier drinks and sides than were fathers. In addition, compared to caregivers who reported on a visit to Subway, caregivers who purchased a kids' meal at Wendy's were less likely to select healthier drinks but more likely to select healthier sides. Caregivers who visited McDonald's and Burger King were also less likely to select healthier drinks compared to caregivers who visited Subway. There were some additional differences in the models to predict healthier

kids' meal drink and side selections. Caregivers who visited the restaurant more frequently were more likely to select a healthier side than caregivers who visited less often, but visit frequency was not associated with healthier drink selections. Healthier kids' meal drink and side selections did not change across the years examined, after controlling for other variables in the model.

The models that further examined visits to McDonald's provide some insights into caregivers' reasons for selecting healthier kids' meal items (Table 3). Caregivers' perceptions of how much their child(ren) like healthier kids' meal drinks and sides were associated with higher odds of selecting those items with a kids' meal, but not with caregivers' purchases of kids' meals. However, caregivers' report of how much their child likes unhealthy sides (ie, McDonald's French fries) was inversely associated with odds of purchasing a kids' meal, as well as selecting a healthier kids' meal side. Higher ratings of the healthfulness of healthier kids' meal sides were also associated with a greater likelihood to purchase a kids' meal, but not to select a healthier side with the kids' meal. In contrast, their perceptions of the healthfulness of healthier kids' meal drinks were not associated with purchasing a kids' meal and negatively associated with selecting a healthier drink with a kids' meal. McDonald's healthier kids' meal sides policy was implemented in 2011. As found in the models that included all four

TABLE 3 Associations between caregivers' perceptions of healthier kids' meal items and purchases at McDonald's

Independent variables	Purchased a kids' meal (n = 863) ^a		Selected a healthier kids' meal drink (n = 643) ^b		Selected a healthier kids' meal side (n = 643) ^b	
	Odds ratio (95% CI)	P value	Odds ratio (95% CI)	P value	Odds ratio (95% CI)	P value
Caregiver gender (Reference = Male)						
Female	0.64 (0.43, 0.94)	.023	1.25 (0.86, 1.82)	.243	1.25 (0.79, 1.99)	.345
Child age (Reference = 6-11 y)						
2-5 y	2.18 (1.52, 3.12)	<.001	2.06 (1.44, 2.93)	<.001	1.07 (0.70, 1.63)	.763
Frequency of restaurant visits (Reference = once a month or less)						
A few times a month	1.52 (0.94, 2.47)	.089	1.15 (0.65, 2.03)	.636	1.67 (0.83, 3.36)	.154
1+ times a week	1.99 (1.18, 3.37)	.010	1.38 (0.77, 2.49)	.283	1.80 (0.87, 3.71)	.112
Year (Reference = 2010)						
2013	0.83 (0.54, 1.27)	.383	1.03 (0.67, 1.59)	.889	30.69 (16.26, 57.92)^c	<.001
2016	0.83 (0.53, 1.31)	.419	1.11 (0.71, 1.72)	.653	1.93 (1.19, 3.13)	.007
Perceived child(ren)'s preference (1 = strongly dislike to 6 = strongly like)						
Healthier side	1.08 (0.99, 1.18)	.093	-	-	1.61 (1.41, 1.84)	<.001
Unhealthy side	0.86 (0.75, 0.98)	.024	-	-	0.70 (0.60, 0.82)	<.001
Healthier drink	1.09 (0.98, 1.22)	.112	1.50 (1.33, 1.69)	<.001	-	-
Perceived healthfulness (1 = very unhealthy to 6 = very healthy)						
Healthier side	1.18 (1.02, 1.37)	.030	-	-	1.16 (0.97, 1.38)	.111
Unhealthy side	1.03 (0.95, 1.12)	.427	-	-	0.96 (0.88, 1.06)	.446
Healthier drink	0.99 (0.84, 1.17)	.943	0.79 (0.68, 0.93)	.004	-	-
Constant	0.58 (0.14, 2.31)	.436	0.21 (0.06, 0.77)	.018	0.03 (0.00, 0.19)	<.001

Note: Boldface indicates statistical significance at 95% confidence level. Other caregiver demographic variables, including education level and race/ethnicity, were excluded from this model as they were not significant in the models to predict purchases at all restaurants.

^aIncludes caregivers who reported a visit to McDonald's in the past week with their child.

^bIncludes caregivers who ordered a kids' meal (Happy Meal or Mighty Kids Meal) for their child in that visit.

^cThe odds ratio is relatively large due to a substantial increase in caregivers' choices of healthier kids' meal sides from 2010 to 2013 (27% to 86%).

restaurants, the odds of selecting a healthier kids' meal side at McDonald's were higher in 2013 and 2016 (post-pledge) than in 2010 (pre-pledge), but the odds of purchasing a kids' meal and selecting a healthier drink with a kids' meal in 2013 and 2016 were not statistically different from those in 2010. In addition, the odds of selecting a healthier kids' meal side at McDonald's was significantly higher in 2013 than 2016.

4 | DISCUSSION

This study found no evidence that caregivers were more likely to purchase a kids' meal for their child or select a healthier drink with a kids' meal when a fast-food restaurant had a policy to automatically offer healthier drinks and/or sides with kids' meals, after controlling for other factors. However, restaurants' healthier kids' meal policies were associated with caregivers' selection of healthier sides with kids' meals. Moreover, the regression models indicate that individual characteristics may be stronger predictors of caregivers' purchases of kids' meals and selection of healthier kids' meal items, including purchases for younger children (2-5 years), caregivers' gender and frequency of visits to the restaurant. After controlling for other variables in the model, the analysis also found some differences by restaurant. Caregivers were less likely to purchase a kids' meal at Subway than at McDonald's, but more likely to select a healthier drink when they purchased a Subway kids' meal. Results from the models for caregivers who visited McDonald's provide some additional insights into caregivers' attitudes and reasons for selecting healthier items. Perceptions that their children like the healthier drinks and sides were positively associated with selecting those items, whereas caregivers' perceptions of the healthfulness of those items appeared to be less influential.

This study has limitations. The repeated cross-sectional study design does not allow for conclusions about causal effects of restaurant healthier kids' meal policies. Furthermore, the regression utilized dummy variables to represent natural variation in implementation of healthier kids' meal policies across restaurants and years, but this design does not allow for direct comparisons of different policy options. Although the models controlled for several individual differences as well as year and restaurant, we cannot rule out the possibility of alternative explanations for associations (or lack thereof) between restaurant policies and caregivers' reported purchases. We used a nonprobability-based sample and oversampled Black and Hispanic caregivers, so the results are not representative of the entire U.S. population. As with all survey research, accurate results are subject to participants' memory and potential self-presentation biases. However, participants provided information about a recent visit (in the past week) and the survey provided lists of all available items at individual restaurant chains to minimize inaccurate responses. Finally, the survey assessed items that caregivers purchased for their child in a recent visit, but it did not measure actual consumption of items or items purchased in other visits. Therefore, we cannot make conclusions about the total nutrition content of the child's meal or whether this visit was representative of all visits to this restaurant.

4.1 | Implications for healthier fast-food policies and evaluation

Although this research design cannot demonstrate causal effects of restaurants' healthier kids' meal policies on caregivers' purchases or children's fast-food consumption, our finding that restaurants' healthier kids' meal drink policies were not associated with increased selection of healthier drinks raises questions about the potential effectiveness of such policies, including both restaurant voluntary and government policies. Controlled experiments and/or quasi-experiments are needed to determine whether healthier kids' meal drink policies reduce children's sugary drink consumption at fast-food restaurants. This research is essential due to widespread introduction of these policies by U.S. municipalities and states,¹⁵ and restaurants' claims that their voluntary policies provide evidence that they are taking action to reduce the negative impact of fast-food consumption on children's diets.¹⁰⁻¹²

Studies should also examine potential explanations for our findings. It could be that when caregivers ordered a kids' meal, restaurant personnel automatically gave them a healthier drink, but they (or their child) specifically requested a sugary drink instead. Alternatively, restaurant personnel could have continued to offer sugary drinks with kids' meals despite the restaurant's official policy to remove them from kids' meal menu boards. Moreover, it is unclear whether personnel received adequate training to implement restaurant policies to automatically offer healthier options. In support of the second explanation, research has demonstrated wide variation in the consistency of restaurant personnel offering available healthier sides and drinks with kids' meal orders,²² and an evaluation of healthier kids' meal default beverage regulations in California and Wilmington Delaware found that only 1% of restaurant staff verbally offered a healthy beverage with kids' meal orders.¹⁶ Although consumers may be more likely to accept healthier options with kids' meals when these items are automatically offered (ie, by default), it appears that poor implementation of these policies may limit their potential effectiveness.²⁷

Additional research is also needed to assess why caregivers select healthier vs unhealthy items in kids' meals and vice versa. This study indicates that simply requiring healthier items to be available on kids' meal menus may not induce caregivers to select them, and that caregivers' perceptions of their child's preferences for healthier items may be more influential. These findings are consistent with previous research demonstrating that children are highly involved in fast-food purchase decisions.²⁶ Our study did find that policies to automatically provide a healthier side at McDonald's and Subway were associated with caregivers' selection of a healthier side for their child. It is interesting to note that Subway was the only restaurant that did not list any unhealthy drinks or sides in all years studied, and caregivers who choose to take their child to Subway may choose the restaurant because of its healthier options. However, it should be noted that McDonald's kids' meals included two sides beginning in 2011,¹¹ so children could receive both a healthier side and a smaller portion of French fries with their kids' meal. The finding that caregivers' perceptions of the healthfulness of healthier drinks on McDonald's kids' meal menu were negatively related to their likelihood of selecting them for their child was unexpected, but also

indicates that additional factors may be more important in caregivers' selection of healthier kids' meal items.

Furthermore, some of our findings suggest that healthier kids' meal policies could lead to potential unintended negative effects, such as increased purchases of larger, higher-calorie regular menu items or increased numbers of visits. For example, Subway kids' meals have fewer calories and are more nutritious than kids' meals at other restaurants,¹⁹ but caregivers in this study were less likely to purchase a kids' meal for their child at Subway than at other restaurants. Similarly, children's preferences for unhealthy sides were associated with a lower likelihood to purchase a kids' meal when visiting McDonald's. In addition, caregivers who took their child to a fast-food restaurant at least once a week were twice as likely to purchase a kids' meal than caregivers who took their child less often. As previously reported, the majority of caregivers in our survey indicated that they would visit these restaurants more often because of restaurant policies to automatically offer healthier drinks or sides with kids' meals.²³ Therefore, research should examine whether offering healthier drinks and sides in fast-food kids' meals may paradoxically contribute to additional purchases of higher-calorie items for children and/or increase fast-food visits. Such research could help explain the increase in fast-food calories consumed by children since 2010²⁴ and/or the increase in caregivers who purchased a kids' meal plus another item (such as a dessert).²³

Finally, these results suggest that a better understanding of the many factors that likely influence caregivers' decisions about fast-food purchases for their children is necessary to design effective policies to improve children's fast-food consumption. For example, in our analysis, caregivers were approximately twice as likely to purchase a kids' meal and 60% to 90% more likely to select healthier kids' meal items for a younger child (2-5 years) than for an older child (6-11 years). However, an evaluation of the calorie content in kids' meals at major fast-food restaurants found that more than one-half to three-quarters of available kids' meal combinations (main dish, side, and drink) exceeded recommended calories for lunch or dinner for children under age 6.¹⁹ Although the majority of kids' meals fell within recommended calories for an older child, caregivers were significantly more likely to purchase regular menu items for children of this age. Therefore, policies are needed to ensure that kids' meals are healthy options for very young children, while policies to improve fast-food consumption by older children must also address the other types of menu items (ie, not kids' meal items) that they regularly consume. Research should also examine other potential reasons that caregivers purchase kids' meals vs regular menu items and select healthier vs less healthy kids' meal items, such as cost, purchase occasions (eg, convenience while on-the-go, special treat), children's role in that decision and how different types of items are marketed to caregivers and children, both inside and outside the restaurant.

4.2 | Conclusions

Policies that require fast food restaurants to automatically provide healthier drinks with kids' meals (so-called "healthy default beverage policies") may represent a promising approach to address this concern

(Healthy Eating Research, 2020). However, this study suggests that such policies may not reduce children's consumption of sugary drinks at fast-food restaurants and could paradoxically lead to unintended outcomes, such as greater purchases of regular menu items and/or increased visits to fast-food restaurants. Given fast-food restaurant chains' voluntary adoption of healthier kids' meal policies and the rapid growth in state and municipality government healthy default beverage regulations, careful evaluation of such policies is warranted. Additional research is needed to examine how healthier kids' meal policies affect children's fast-food consumption, and advocates and policy makers should wait to implement additional policies until research has demonstrated that they lead to positive public health outcomes. Alternative regulations and incentives to reduce children's fast-food consumption should be explored, such as regulation to limit fast-food marketing to children, economic incentives for restaurants to sell healthier foods, and taxes on unhealthy fast food.⁴

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CONFLICT OF INTEREST

The authors have no conflicts of interest to report.

AUTHOR CONTRIBUTIONS


Yoon Y. Choi: Designed and conducted the statistical analyses and wrote the first draft of the manuscript. **Maia Hyary:** Assisted with data analysis, interpretation and writing the manuscript. **Frances Fleming-Milici:** Assisted in writing the manuscript and critically reviewed the manuscript. **Jennifer L. Harris:** Obtained funding, designed the study, assisted with data interpretation and provided critical revisions to the manuscript. We would like to thank all the Rudd Center staff and students who assisted with study design and data collection during the 3 years of this study.

INFORMED CONSENT

This study was determined to be exempt by Institutional Review Board of the University of Connecticut in 2016 (approval reference number: #X16-055) and the Principal Investigator's previous University (Yale University)'s Institution Review Board in 2010. Study participants provided written informed consent.

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SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section at the end of this article.

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