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Abstract

Aim: This study aimed to assess the impact of including healthier options on fast food restaurant menus on total energy of parent-reported intended purchases and frequency to eat at fast food outlets for young children.

Methods: Parents from an existing health survey cohort were approached to participate. They were eligible to participate if they resided in the [removed for blind peer review] region in [removed for blind peer review], could understand English and had a child aged between three and 12 years. Parents were randomised using a random number function embedded in the computer assisted telephone interview software, to receive one of two hypothetical fast food menus: one with healthier options and the other without healthier options (standard menu). After receiving these menus, participants completed a second telephone survey. Parents reported intended food purchases for their nominated child and intended number of visits to the fast food outlet with the hypothetical menu.

Results: There was no significant difference in total energy of parent reported intended purchases for their child, between the standard menu with (n=101) and without (n=113) healthier options (p=0.60). There was also no difference in the frequency of intending to eat at the fast food restaurant between the two groups (p=0.80).

Conclusions: The provision of healthier options in itself may not reduce the total energy of intended purchases of parents for young children at fast food restaurants.

Keywords:

Public Health Nutrition, Obesity, Children, Dietary Intake, Food.

Introduction

Overweight and obesity has been one of the fastest growing public health problems in developed countries over the past decade.¹ More than 60% of the adult population in the United States (US), United Kingdom (UK) and Australia are overweight or obese.²⁻⁴ Excess weight is associated with an increased risk of chronic conditions, including cardiovascular disease, type 2 diabetes, osteoarthritis and some cancers.⁵⁻⁷ The prevalence of overweight or obesity in children is also unacceptably high.⁸ Children who are obese experience a range of adverse health conditions including elevated blood pressure and lipids, as well as low self-esteem and increased psychological morbidity.^{9,10} Importantly, children who are overweight are also more likely to be overweight in adulthood.¹¹

Rapid changes to food supply and eating environments have provided easy access to energy-dense and highly processed foods.^{12,13} Foods prepared away from home, particularly fast foods, are increasingly consumed.^{14,15} Population increases in fast food consumption are of concern as these foods are usually more energy-dense, lower in nutritional quality, and served in larger portions, when compared to foods prepared at home.^{14,16,17} An increased consumption of fast food has also been linked to greater total energy and fat intakes, as well as weight gain in both adults and children.^{16,18,19} In Australia, approximately 30% of weekly food and beverage expenditure is spent on foods consumed away from home.²⁰ Take away and fast food meals account for half of this expenditure.²⁰ In just six years the proportion of expenditure on fast food meals has increased by 50% (2003 to 2009).²⁰ A national survey with over 20,000 Australian aged 14 years and above found that 32.7% dined in and 6.6% purchased food to take away from a fast food restaurant several times per week.²¹ Further, findings from other studies suggest that those with lower education had significantly higher

odds of consuming ‘less healthy’ takeaway choices, resulting in higher contribution of such foods to energy, total fat and saturated fat consumption.²²

Government and non-government agencies have called for more stringent regulations for the fast food industry, in an effort to address the burden of obesity in the population.²³

Specifically, agencies have recommended that food establishments take two approaches: i) provide consumers with caloric information in a standard, easily accessible format; and ii) increase the availability of low-energy menu items.²³ A number of jurisdictions in Australia, the UK and the US have introduced mandatory point-of-purchase menu labelling in fast food outlets. The real-life impact of menu labelling on the purchasing behaviour and public health nutrition has also been well documented.²⁴ While it has not been mandatory for fast food restaurants to include lower energy, healthier meal options, the introduction of menu labelling legislations has coincided with an increase in the availability of healthier foods at major fast food restaurants.²⁵ For example, McDonalds and Subway have adopted healthier main meal and side alternatives,²⁶ with McDonalds recently committed to providing all customers a choice of side salad, fruit and vegetables as a substitute for French fries in value meals.²⁷

The effect of introducing healthier menu items on consumer purchasing intentions or behaviours has received little attention in the literature. Counter-intuitively, there is evidence to suggest that providing healthier food options on fast food menus may result in adverse purchasing outcomes.^{28 29} There is also research showing that healthy menu item marketing by fast food outlets may result in a ‘health halo’ effect, whereby consumers may purchase a more energy-dense side option because they perceive that their healthier main meal choice is lower in energy, which can lead to a net increase energy intake.³⁰ Other researchers have reported that some restaurants may choose to provide healthier menu options to increase

visits by groups who would otherwise chose alternative, potentially healthier, eating establishments.³¹ While parents play a key role in selection of food meals consumed for their young children,^{32 33} little is known regarding how adding healthier menu items may impact on parents intended purchasing for their children.

The primary aim of this study therefore was to assess the impact of adding healthier food options to a fast food menu on: i) the total energy of intended food purchases for children; and ii) the number of intended visits to a fast food outlet.

Methods

The study employed a randomised controlled trial design. Both participants and interviewers were blinded to their group allocation. A CONSORT flow chart of the randomisation procedure can be seen in Figure 1.

<Figure 1 approximately here>

Ethical approval was provided by [removed for blind peer review]. Parents were randomly recruited via an existing research cohort, established as part of a household Child Health Survey. Parents were eligible if they had a child living with them aged between three to twelve years inclusive, and if they resided in the [removed for blind peer review]. If a parent had more than one child aged between three and twelve years old, the parent was asked to provide responses for the child who had the most recent birthday (nominated child).

Consenting participants were invited to complete two scripted Computer Assisted Telephone Interviews (CATIs) conducted by trained research assistants. Data collection for the first CATI was conducted between June and July 2011. Following completion of the first

telephone interview, participants were randomly allocated to one of two experimental arms in a 1:1 ratio using a random number function embedded in the CATI software. Depending on their group allocation, participants were mailed one of two hypothetical fast food menus up to two weeks after completing the initial interview. Approximately one to two weeks after the menus had been posted, parents were contacted to complete the second CATI (between June and August 2011). The second interview occurred an average of 13 days after the completion of the first interview. This second CATI was only conducted with participants who had received, and had access to, the menu during the telephone call.

Food items included in both healthier and less healthy (standard) menus were selected based on actual menus from popular fast food outlets available in [removed for blind peer review]. Pricing and nutrition information of all included food items were also obtained from the [removed for blind peer review] websites of these fast food outlets. Product names were modified and all specific brands and descriptors were removed to ensure only generic descriptions of products remained.

The standard menu contained 26 food and beverage items. Examples of menu items included soft drinks, soft serve ice cream in a cone, a regular hamburger and chicken nuggets. These items were grouped into three categories on the menu: beverages; main menu items; and desserts. The measures for beverages (in millilitres) and unit prices were available next to each item on the menu.

The modified fast food menu contained exactly the same items as the standard menu, and used the same three categories to group items. An additional 10 healthier food and beverage options were added under the three category headings. Examples of healthier food and

beverage items included water, sliced apples, a grilled chicken and salad wrap with or without sweet chilli sauce and fruit salad.

To ensure that the options provided in the healthier menu were more nutritious, a dietitian classified all items on the menus as 'red' or 'amber' (for small fruit juices, with no added sugar) and all healthier items as either 'green' or 'amber' (for salad with high-fat dressing) using school canteen guidelines.³⁴ Items included on the healthier menu had lower energy profile, fat, salt or sugar content. A summary of the total number, average energy content and average price of items on each menu are presented as a supplementary file.

During the first telephone interview, participants were asked to self-report their age, sex, highest level of education, height, weight and usual frequency of fast food consumption. They were also asked to report on the age, sex, height, weight and usual frequency of fast food consumption of their nominated child. They were also asked to report on the age, sex, height, weight and usual frequency of fast food consumption of their nominated child. The number of serves of fruits and vegetables consumed by participants and their child was determined using a validated two-item questionnaire³⁵ obtained from a routinely conducted population health survey.³⁶ No information related to purchasing of food was assessed in the first interview.

During the second telephone interview, participants were asked to choose what beverage, main meal or desert items they would be likely to purchase for their nominated child for lunch if they attended a fast food outlet with the hypothetical menus. Participants could select as many or as few items as they wanted to. The energy content of the entire intended

purchase was summed for all selected items based on the energy information available on fast food websites.

All data analyses and sample size calculations were conducted using SAS v9.2. Child overweight and obesity scores were calculated using the Centre for Disease and Control (CDC) percentiles.³⁷ Height and weight measurements were used to calculate body mass index (BMI) and classify adults as overweight or obese (defined as $BMI \geq 25 \text{ kg/m}^2$). Total energy of intended purchases was assessed by summing the energy of each product that participants indicated they would purchase from the hypothetical fast food restaurant. Differences between experimental groups in total energy purchases and frequency of intended visits to a fast food outlet were assessed using t-tests. Differences between experimental groups for different levels of demographic and lifestyle characteristics and health behaviour variables were assessed using two-way ANOVA techniques. The percentage of parents intending to purchase each food type for each group was compared using Pearson's Chi-square test. A significance level of 0.05 was used.

Sample size analyses indicated that to detect 0.4 of a standard deviation difference in mean energy content of intended purchases between groups with 80% power and $\alpha=0.05$, approximately 98 participants were required per group. Based on previous research, this sample size would be sufficient to detect a difference of 592 kJ (15%) in hypothetical energy consumption, assuming an energy consumption of approximately 3903 kJ in the standard menu group.³⁸

Results

Overall, 246 participants were randomised to either the standard menu group (n=123) or the healthier options menu group (n=123) (see Figure 1). One hundred and one participants

(82%) from the standard menu group and 113 (92%) from the healthier options group completed the second CATI. There were no significant differences in parent and child demographic characteristics between those who completed and did not complete the first and second survey. No differences between experimental groups with regard to child or parent demographic characteristics, health behaviour variables, weight or frequency of fast food consumption were identified (see Table 1).

<Table 1 approximately here>

There were no significant differences in the total energy content of intended meal purchases for children ($p=0.60$) between the standard menu (2696 kJ, SD=709) and healthier options menu group (2639 kg, SD=859). There were no differences in energy content of intended purchases by meal category (beverage (standard menu: 467kJ, sd=168; healthier menu: 473 kJ, sd= 220; p -value: 0.83), main meal (standard menu: 1933kJ, sd=157; healthier menu: 1933 kJ, sd= 681; p -value: 1.0), dessert (standard menu: 296kJ, sd=265; healthier menu: 233 kJ, sd= 273; p -value: 0.09)). There was also no difference in the intended frequency of eating at a fast food outlet between the two groups (1.9, sd=2.7 in standard menu, 2.2, sd=3.1 in healthier menu; p -value=0.80)

Only a small proportion of parents (less than 20%) selected a healthier option for each of the meal categories (see table 2). A significantly larger proportion of parents who received the menu with healthier options intended to purchase medium or large fries ($p=0.0479$) and apple pie ($p=0.0329$) compared to the standard menu group.

<Table 2 approximately here>

The impact of adding healthier options on total energy of intended purchases in the two arms did not differ by child or parent demographic and lifestyle variables (including weight status and average fruit and vegetable consumption) (see Table 3).

<Table 3 approximately here>

Discussion

This study is the first randomised controlled trial to examine whether providing healthier food options on fast food menus has an impact on parents' food purchasing intentions for their child. The study found no significant difference in the total energy of intended purchases between the two groups. While no changes in overall energy was identified, a larger proportion of parents who received the healthier menu intended to purchase medium or large fries as a side or apple pie for dessert, suggesting that the provision of healthier options may result in higher likelihood of selecting less healthy choices. Such findings are consistent with that reported by other research which suggests that individuals may purchase unhealthier sides due to perceptions that they have chosen a healthier main meal.^{28, 30} Encouragingly, findings from this study also revealed that the provision of healthier options did not increase the number of intended visits for the child to a fast food outlet.

Despite findings from this study, consumer support and demand for the provision of healthier food options at fast food outlets is high.³¹ Additionally, the World Health Organisation recommends that health promotion practice embedded within environmental settings should be used as a public health strategy to promote healthier behaviours.⁸ Healthier options at restaurants, including fast food outlets, could help to increase micronutrient intakes and improve macronutrient profiles at the population level, although this was not assessed here.³⁹ Importantly, no adverse effects on children were observed following the introduction of a healthier menu initiative.

Based on the current trial it appears that the provision of healthier menu alternatives in itself is an insufficient strategy to change purchasing behaviour. A potential reason for the lack of

selection of healthier options could be due to the higher prices of the items on the healthier menu. Multi-strategic approaches involving government, industry and health partners that concurrently target other determinants of purchasing behaviour including pricing, taste, promotion and commercial advertising may be required to achieve a reduction in purchasing of unhealthy foods.²⁰ Alternative initiatives such as fast food reformulation to improve the total energy profile and the reduction of portion sizes have also been proposed.¹⁴

There are a number of limitations that need to be considered. First, there is potential for bias in the method of sample selection. The parents approached for this study had previously indicated that they wanted to participate in future health surveys and may therefore be more health conscious. The parents participating in this study also reported lower fast food visits than the general population which may have impacted on their selection of food choices in this study. Second, this study used parental self-report of intentions to purchase food items for their child, which is likely to be subject to social desirability bias. However, the limited retail data that does exist supports the null-effect observed in the present trial.²⁹ While self-reported intentions are a well-used method of data collection to assess impact of changing menus,^{24,40} individuals are likely to be affected by a range of social and environmental cues present in real life situations,^{14,41} such as the inclusion of incentives (e.g. toys) or promotional pricing when making a purchase in real life. Finally, there was a delay between when parents were sent the menu and when they reported on their intended purchases.

The inclusion of healthier options on a fast food menu did not result in any reduction in the total energy content of parent-reported intended purchases for their young children.

Importantly, intentions to visit a fast food restaurant did not increase following the introduction of these healthier options. Findings from this study suggest that the addition of

healthier options in itself as a strategy for reducing overweight and obesity may not be useful in reducing total energy consumption from fast foods at a population level.

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[removed for blind peer review]

Conflicts of interest

[removed for blind peer review]

Authorship

[removed for blind peer review]

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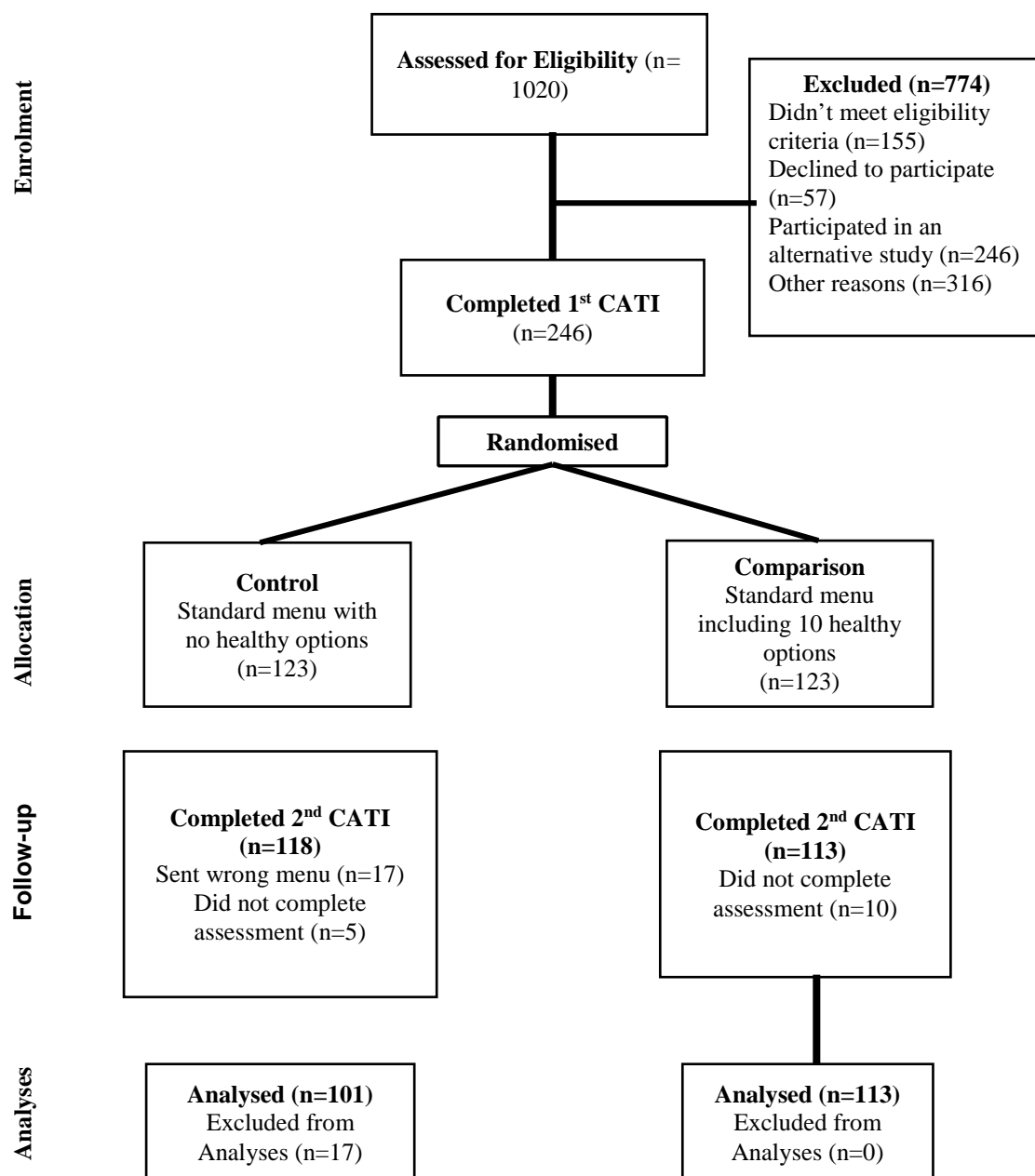
Figure 1 CONSORT flow diagram for participant allocation into study arms

Table 1 Characteristics for children and parents as reported in the first survey for participants in the standard menu and menu with healthier options group

	<i>Standard menu</i>	<i>Menu with healthier options</i>	
	<i>(n=113)</i>	<i>(n=101)</i>	
<i>Children</i>	<i>Mean (SD)</i>	<i>Mean (SD)</i>	<i>p^a</i>
Age	8.1 (2.8)	7.8 (2.9)	0.85
Frequency of fast food meals/month	2.4 (2.4)	2.5 (2.3)	0.79
	%	%	
Female	52	42	0.14
Overweight/obese ($\geq 85^{\text{th}}$ BMI percentile ^b)	36	32	0.69
<i>Parents</i>	<i>Mean (SD)</i>	<i>Mean (SD)</i>	<i>p^a</i>
Age	40.3 (7.3)	40.2 (6.3)	0.84
Frequency of fast food meals/month	2.4 (2.8)	2.5 (2.48)	0.64
	%	%	
Female	86	85	0.83
Overweight/obese (BMI $\geq 25\text{kg/m}^2$)	45	50	0.46
University educated	37	39	0.77

Note: SD: Standard Deviation; BMI: Body Mass Index

^a *p-values for t-tests (means comparisons) or chi square (proportions).*

^b *Based on CDC percentiles³⁷*

Table 2 The type of intended food purchases for children by standard menu and menu with healthier options.

	<i>Standard menu</i>	<i>Menu with healthier options</i>	<i>p^a</i>
	<i>(n=101)</i>	<i>(n=113)</i>	
Beverages, n (%)			
Soft drink	45 (44)	45 (40)	0.5538
Diet soft drink	6 (5.9)	2 (1.8)	0.1143
Juice	48 (48)	47 (42)	0.3783
Healthier options (including milk and water)	NA	20 (18)	
Would not have any drink at the fast food restaurant	2 (2.0)	2 (1.7)	0.8706
Main meal and sides, n(%)			
Burger (including cheese burger, double beef burger deluxe, regular hamburgers)	34 (34)	29 (26)	0.2014
Crunchy wraps	24 (24)	21 (19)	0.3730
Nuggets	43 (43)	52 (46)	0.6594
Small fries	70 (69)	70 (62)	0.2828
Medium/large fries	11 (11)	24 (21)	0.0479*
Healthier options (including sliced apples, garden salad, Caesar salad, grilled wraps)	NA	14 (12)	
Desserts			
Soft serve	35 (35)	27 (24)	0.40772
Sundae	17 (17)	20 (18)	0.8477

Apple pie	0 (0)	5 (4.4)	0.0329*
Cookies	3 (3.0)	3 (2.7)	0.8951
Healthier options (fruit salad)	NA	9 (8.0)	
Would not have dessert	46 (46)	49 (43)	0.6593

NA: Options not available on standard menu

^ap-value for Chi-square comparisons,

Table 3 Total energy content of parent-reported intended purchases for their children by demographic and lifestyle characteristics in standard menu and menu with healthier options group.

			<i>Standard menu</i> (<i>n</i> =101)	<i>Menu with</i> <i>healthier options</i> (<i>n</i> =113)	
<i>Child</i>		<i>n</i>	<i>Mean kJ (SD)</i>	<i>Mean kJ (SD)</i>	<i>p^a</i>
Age	≤ 8 years ^b	101	2634 (511)	2435 (809)	.
	> 8 years	113	2749 (840)	2839 (867)	0.18
Gender	Male	102	2679 (795)	2534 (934)	.
	Female	112	2712 (627)	2781 (732)	0.33
Number of fast food	≤ twice/month	113	2720 (769)	2549 (938)	
Meals/month	> twice/month	101	2649 (580)	2791 (691)	0.4
BMI	Underweight/average ^c	59	2667 (642)	2794 (876)	.
	Overweight/obese	53	2558 (628)	2754 (922)	0.82
Fruit Consumption	< 2 serves	58	2849 (741)	2635 (697)	.
	≥ 2 serves	156	2638 (692)	2640 (915)	0.39
Vegetable Consumption	< 5 serves	191	2738 (701)	2626 (878)	.
	≥ 5 serves	23	2417 (723)	2773 (645)	0.19
<i>Parent</i>					
Age	≤ 40 years	118	2190 (1118)	2158 (1114)	.
	> 40 years	113	1884 (1255)	2098 (1046)	0.41
Gender	Male	31	2713 (785)	2909 (666)	.
	Female	182	2689 (703)	2591 (883)	0.34
Education	Non-university	133	2769 (705)	2698 (734)	.
	University	81	2571 (707)	2546 (1027)	0.84

Number of fast food meal per month	\leq twice/month	142	2724 (762)	2588 (905)	.
	$>$ than twice/month	74	2637 (583)	2732 (771)	0.32
BMI	Underweight/average	113	2680 (736)	2528 (883)	.
	Overweight/obese	101	2717 (681)	2751 (827)	0.39
Fruit Consumption	< 2 serves	104	2872 (604)	2773 (816)	.
	≥ 2 serves	110	2524 (765)	2516 (886)	0.67
Vegetable Consumption	< 5 serves	190	2720 (718)	2620 (908)	.
	≥ 5 serves	24	2460 (590)	2764 (422)	0.25

Note: SD: Standard Deviation; BMI: Body mass index

^a *p-values refer to the interaction between menu group and the dependent variable*

^b *The cut-off point of 8 years was selected based on the median value from the data sample*

^c *Number less than total due to unknown weight and height data*

