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A quasi-experimental study of a mandatory calorie-labelling policy in restaurants: Impact on use of nutrition information among youth and young adults in Canada

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ABSTRACT

In 2017, Ontario became the first Canadian province to require calorie amounts on menus/menu boards of chain restaurants. The province of British Columbia (BC) implemented a voluntary nutrition information initiative in which calorie and sodium information were available upon request. A quasi-experimental design was used to examine the use of nutrition information in Ontario (mandatory calorie labelling), compared to BC (voluntary policy) and three other provinces with no formal menu labelling policy ('control'). Data were collected from youth and young adults (16–30 years) in all provinces pre- (fall 2016; $n = 2929$) and post- (fall 2017; $n = 968$) implementation of Ontario's calorie-labelling policy in January 2017. Generalized estimating equations tested differences between provinces over time in noticing and impact of nutrition information and support of mandatory calorie labelling. Noticing of nutrition information in restaurants increased in Ontario significantly more than in BC (+25.1% vs. +1.6%; AOR = 4.26, 95% CI = 2.39–7.61) and control provinces (+6.5%; AOR = 3.00, 95% CI = 1.91–4.73). Ontario respondents were significantly more likely to report that the nutrition information influenced their order than those in BC (+12.9% vs. +2.2%; AOR = 3.53, 95%CI = 1.61–7.76) and control provinces (+2.0%; AOR = 3.71, 95%CI = 1.87–7.36). Policy support increased in all groups at follow-up, with a significantly greater increase in Ontario than control provinces (+12.9% vs. +5.7%; AOR = 1.57, 95%CI = 1.06–2.34). Socio-demographic differences were also observed. Findings suggest that the mandatory menu labelling policy implemented in Ontario has increased noticing and use of nutrition information, with no evidence to support the effectiveness of voluntary policies that require consumers to request nutrition information.

1. Introduction

Eating outside the home has become a routine part of the North American diet. In Canada, 83% of Canadian youth and young adults eat at least one meal per week outside the home (Wiggers et al., 2018), which is associated with higher intakes of calories, fats, added sugars, and sodium (Todd et al., 2010). Although many chain restaurants voluntarily provide some in-store nutrition information, it is usually presented only upon request or for a subset of items (Hobin et al., 2015).

In the U.S., federal regulations have required mandatory calorie amounts on menus/menu boards at chain restaurants since May 2018 (U.S. Food and Drug Administration, 2018). In Canada, Ontario became the first province to implement mandatory calorie-labelling regulations in January 2017. Sit-down and quick-service restaurants with > 20 locations in Ontario are required to post calorie amounts next to items on menus/menu boards (Government of Ontario, 2015). In British Columbia (BC),[1] the Informed Dining program (IDP) was launched in 2012 (Healthy Families BC, 2012) as a voluntary nutrition information program for private food services. Participating establishments must display the program logo and directional statement (e.g., 'See our nutrition brochure') on menus/menu boards, and make information on calorie and sodium content available upon request (Healthy Families BC, 2012). This information is typically provided in the form of a pamphlet; posting nutrient information on menus is not required. Preliminary evaluation of the IDP revealed a lack of public awareness and

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[1] Abbreviations: AOR: adjusted odds ratio; BC: British Columbia; BMI: body mass index; CCHS: Canadian Community Health Survey; IDP: Informed Dining program

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barriers such as having to ask for the nutrition information (Government of British Columbia, 2016).

To date, few high-quality randomized controlled trials have examined calorie labelling on menus, and laboratory studies have shown mixed results. In contrast, well-powered quasi-experimental or naturalistic studies have tended to show significant reductions in calories purchased (Bleich et al., 2017). In Canada, several experimental (Hammond et al., 2013) and quasi-experimental or 'naturalistic' studies (Hammond et al., 2015; Olstad et al., 2015; Vanderlee, 2016; Lillico et al., 2015) have been conducted, generally indicating that menu labelling is associated with greater noticing and use of nutrition information in restaurants, as well as reduced calories purchased and/or consumed (Hammond et al., 2013; Hammond et al., 2015; Olstad et al., 2015). There is a lack of research examining population-level changes in response to menu labelling policies.

The current study used secondary cohort data to examine the impact of mandatory and voluntary policies on the use of nutrition information at restaurants among youth/young adults in Ontario (mandatory calorie labelling policy) compared to BC (voluntary IDP) and other provinces (Alberta, Nova Scotia, Québec). The latter provinces, which may have had some minor exposure to the IDP, were considered a naturalistic 'control' group. Young adulthood is an important demographic given young people's high rates of eating outside the home (Wiggers et al., 2018); it is also an important period for the development of long-term dietary behaviours (Nelson et al., 2008).

2. Methods

2.1. Participants and recruitment

Data were collected as part of the Canada Food Study, a cohort of 3000 16–30-year-old respondents from five Canadian cities/provinces (Toronto, Ontario; Montreal, Québec; Halifax, Nova Scotia; Edmonton, Alberta; and Vancouver, BC). Participants were recruited in October—December 2016. Eligibility criteria consisted of age 16–30 years, fluency in English or French, residence in one of the five cities and internet access. Participants were asked to complete the survey again in fall 2017.

2.2. Procedure

Participants provided informed consent, received $2 CDN in cash at initial recruitment and $20 CDN upon completion of the surveys. Response rates in waves 1 and 2 were 48.1% and 37.3%, respectively. Detailed methods (including survey weighting and detailed measures) are available in the study's Technical Reports (Hammond et al., 2016; Hammond et al., 2017). The project was reviewed and received ethics clearance through a University of Waterloo Research Ethics Committee (#21631).

2.3. Measures

2.3.1. Socio-demographic variables and other covariates

Respondents provided their province of residence and postal code (both waves) and current city (wave 2). The remaining variables were assessed at wave 1: age, biological sex, race, student status, maternal education, income adequacy, perceived diet quality, past-year weight loss attempts, health literacy (measured with the Newest Vital Sign (Weiss et al., 2005)) and household food security (using the adapted CCHS Module (Government of Canada, 2012)). BMI classification was calculated using self-reported height and weight.

2.3.2. Condition assignment

Respondents were assigned a study 'condition' corresponding to their place of residence [0 = Control (Other provinces), 1 = Mandatory policy (Ontario), 2 = Voluntary policy (BC)]. Respondents with discrepant locations between the two waves or those who had moved in/out of Ontario/BC were excluded.

2.3.3. Outcome variables

(1) Noticing any nutrition information was assessed using: "The last time you visited a restaurant, did you notice any nutrition information?" (1 = Yes, 0 = No/Don't know). If respondents answered "Yes", the following two questions were asked: **(2) noticing nutrition information on menus:** "Where was this information located?" (1 = Menu/menu board, 0 = Other location/Don't know/Not applicable) and **(3) influence of nutrition information**: "Did the nutrition information influence what you ordered?" (1 = Yes, 0 = No/Don't know/Not applicable). **(4) Impact of nutrition information** was assessed using, "In the past 6 months, have you done any of the following because of nutrition information in restaurants?" (Ordered something different, Ate less of the food you ordered, Changed which restaurants you visit, Ate at restaurants less often, None of the above, Don't know, Refuse) and recoded (1 = Yes, at least one of these, 0 = No/Don't know). **(5) Support for mandatory calorie labelling** was assessed using, "Would you support or oppose a government policy that would require calorie amounts on menus of chain restaurants?" (1 = Support, 0 = Oppose/Neutral/Don't know). 'Not applicable' codes applied to respondents who did not see questions due to skip logic.

2.4. Statistical analysis

ANOVA (continuous variables) and Chi-square analysis (categorical variables) indicated significant differences in demographic variables across conditions (data not shown); these covariates were entered into generalized estimating equations (GEEs, described below).

Repeated-measures logistic GEEs were fitted to assess differences over time between the three conditions on each of the five outcomes (listed above). In each model, indicator variables for study condition (mandatory, voluntary, or no policy) and survey wave (1 or 2) were entered along with the following covariates: sex, age, race, BMI classification and survey completion mode (smartphone vs. other device) (block 1), and adjusted for student status, maternal education level, income adequacy, household food security status, perceived diet quality, past-year weight loss attempt and health literacy (block 2). A two-way interaction variable between condition and wave was used to test differences between conditions over time (block 3). Main effects of wave and condition are reported for block 2; interaction effects and main effects of covariates are reported for the final adjusted model (block 3). Weighted results and adjusted odds ratios (AORs) with 95% confidence intervals (95%CI) are reported unless otherwise indicated. Statistical analysis was conducted using SPSS version 25.0 (IBM, Armonk, NY). Values of $p < 0.05$ were considered significant.

3. Results

After excluding respondents with incomplete data, data quality concerns and those who had not visited a restaurant in the past 6 months, the final analytic sample consisted of 3897 participants (wave 1: $n = 2929$; wave 2: $n = 968$). Table 1 displays characteristics of the analytic sample at wave 1.

3.1. Noticing of nutrition information

With regards to noticing nutrition information in restaurants, there were significant main effects of survey wave ($X^2 = 54.22$, $p < 0.001$), condition ($X^2 = 12.66$, $p < 0.01$), and the interaction between condition and survey wave ($X^2 = 12.66$, $p < 0.01$) (Fig. 1A). Ontario respondents were significantly more likely to report noticing nutrition information at wave 2 vs. 1 than were control (+25.1% vs. +6.5%; AOR = 3.00, 95%CI = 1.91–4.73) or BC respondents (+1.6%; AOR = 4.26, 2.39–7.61). BC and control respondents did not significantly differ.