The calorie counter-intuitive effect of restaurant menu calorie labelling

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Abstract

As of January 1, 2017, the *Healthy Menu Choices Act* mandates that food service premises with 20 or more locations in Ontario must display the number of calories in every food item sold on menus. The impetus for this legislation was to enable Ontarians to become aware of the calorie content of foods and beverages consumed outside the home, and make healthier dietary choices while dining out. Though arising as an initiative to attenuate the development of obesity and current obesity rates, evidence suggests menu labelling does not significantly alter individuals' food choices. Moreover, focusing primarily on caloric content may be an ineffective, and perhaps detrimental, strategy to effect change in the obesity epidemic. Beyond the initiative's questionable utility, there has been a lack of consideration as of yet to the unintended negative implications this initiative may have on eating disorder (ED) symptomatology in the general population and those attempting to recover from an ED. The objective of the current commentary is thus to argue that in light of evidence of minimal benefit and the potential for harm, nutrition labelling on menus may be a misguided public health initiative.

Résumé

Depuis le 1^{er} janvier 2017, selon la *Loi pour des choix santé dans les menus*, les chaînes de restauration qui comptent 20 établissements ou plus en Ontario sont tenues d'afficher le nombre de calories de chaque aliment au menu. La loi vise à permettre à la population ontarienne de se familiariser avec la teneur calorique des aliments et des boissons consommés à l'extérieur du foyer et de faire des choix alimentaires plus sains dans les restaurants. L'intention de l'initiative était de freiner la montée de l'obésité et de réduire les taux d'obésité actuels, mais les données semblent indiquer que l'étiquetage nutritionnel des menus ne modifie pas sensiblement les choix d'aliments des particuliers. De plus, la polarisation sur la teneur calorique pourrait être une stratégie inefficace ou même nuisible pour endiguer l'épidémie d'obésité. Outre l'utilité contestable de l'initiative, il n'a pas été tenu compte jusqu'à maintenant des conséquences négatives imprévues qu'elle pourrait avoir sur la symptomatologie des troubles alimentaires (TA) dans la population générale et chez les personnes qui tentent de se remettre d'un TA. Dans notre commentaire, nous faisons valoir que vu les preuves de ses bienfaits minimes et de ses préjudices possibles, l'étiquetage nutritionnel des menus pourrait être une initiative de santé publique malavisée.

Keywords Eating disorder · Obesity · Calorie · Public health · Nutrition labelling · Food choices

Mots-clés Troubles alimentaires · Obésité · Calorie · Santé publique · Étiquetage nutritionnel · Choix d'aliments

In Ontario, more than 1 in 10 youth under 18 and 1 in 4 adults and seniors are obese, with rates significantly increasing over the past decade (Public Health Ontario 2015). Recent public

health initiatives have arisen attempting to prevent and reduce obesity across the lifespan. The *Healthy Menu Choices Act* enacted January 1, 2017 is one such initiative, and mandates that food service premises with 20 or more locations in Ontario must display the number of calories in every item sold on menus (Government of Ontario 2017). The impetus is to enable Ontarians to become aware of the calorie content of foods and beverages consumed outside the home to make healthier, better-informed dietary choices.

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Potential benefits of the *Healthy Menu Choices Act*

Advocates of menu calorie labelling note restaurant foods comprise an increasing proportion of individuals' caloric consumption (Block and Roberto 2014), with evidence that consumer spending on restaurant food has increased since the mid-1990s (Cantu-Jungles et al. 2017). When compared with home-cooked meals, meals purchased outside the home tend to exhibit larger portion sizes and higher caloric content, and thus may promote overeating (Roberto et al. 2013). Regardless of ED, dieting, or weight status, individuals demonstrate low accuracy in their estimations of the calories in restaurant meals (Roberto et al. 2013). Thus, providing calorie information may allow individuals to select lower-calorie meals that are more in line with their daily energy requirements. Block and Roberto (2014) further argue that exposure to menu calorie labelling may enhance consumers' awareness of calories and healthy eating over time. Despite these potential benefits, there is evidence to argue this initiative may fail to acknowledge obesity's complex causality (Camacho and Ruppel 2017; Lucan and DiNicolantonio 2014), does not significantly modify individuals' consumption (Cantu-Jungles et al. 2017; Long et al. 2015), and may have unforeseen consequences for those with and at risk of eating disorders (EDs), as well as those with obesity.

“Calories in, calories out” does not fully explain obesity

Obesity's cause is often boiled down to the notion that the number of calories individuals ingest exceeds the number expended; thus, the “cure” is to simply encourage them to “eat less, move more” (Camacho and Ruppel 2017; Lucan and DiNicolantonio 2014). However, this explanation does not adequately capture obesity's multifaceted aetiology (Camacho and Ruppel 2017). Dietary composition critically influences the accumulation of body fat more than calorie balance alone (Camacho and Ruppel 2017) due to the differential downstream effects of various macronutrients on metabolic and endocrine pathways (Lucan and DiNicolantonio 2014). Specifically, processed foods are often energy-dense; have high glycemic load, unhealthy dietary fats, sugar, and sodium; and are low in fibre, micronutrients, and phytochemicals (Camacho and Ruppel 2017). These foods can induce hormonal imbalance characterized by sustained insulin secretion, which promotes fat accumulation (Camacho and Ruppel 2017) and leptin resistance, thereby creating a neurohormonal drive to “eat more, move less” (Lucan and DiNicolantonio 2014). Accordingly, reducing calorie intake without discriminating the source of calories may impact weight short-term via

decreasing metabolically-active, fat-free mass (e.g., muscle), but may less effectively decrease fat mass (Camacho and Ruppel 2017). Subsequent weight regain commonly occurs, spurring repeated dieting attempts (Romano et al. 2018). For some, sustained effort to restrict calories also contributes to the emergence of ED behaviours, such as binge eating and/or undereating (Fairburn 2008). Weight loss-focused, calorie-centric interventions thus exhibit minimal long-term effectiveness and commonly elicit weight cycling, poor physical and mental health, weight stigma, and ED symptomatology (Romano et al. 2018). Ultimately, these interventions negligibly improve chronic disease risk and health (Lucan and DiNicolantonio 2014).

Calorie labelling perpetuates stigma and fails to impact consumption

Presenting menu calorie labelling as a public health initiative to remedy obesity essentially negates obesity's complex causality and suggests it is simply a matter of education; once given access to calorie information, individuals will make healthier choices, lose weight, and be cured (Cantu-Jungles et al. 2017). This is problematic for multiple reasons. First, it detracts from recent shifts in understanding obesity as a chronic disease, insinuating that to combat obesity, individuals simply need to exert more self-control to manage their caloric intake. Focusing on calories may therefore perpetuate blame and weight stigma (Lucan and DiNicolantonio 2014). Second, there is mixed evidence with respect to the impact of menu calorie labelling on individuals' food choices. Though some studies do show a significant reduction in calories ordered per meal, this effect appears to be limited to studies within non-restaurant settings or restaurant settings without control conditions (Long et al. 2015). Recent meta-analyses (e.g., Cantu-Jungles et al. 2017; Long et al. 2015) indicate menu calorie labelling does not elicit significant changes in the quantity of calories ordered or consumed in restaurants outside of a laboratory setting, nor does it impact the quality of energy consumed with respect to total carbohydrates, total or saturated fat, or sodium (Cantu-Jungles et al. 2017).

One reason for its ineffectiveness may be that a significant proportion of individuals do not even notice calorie labels (Cantu-Jungles et al. 2017; Larson et al. 2018). Among 1830 adults in the general population, only 52.7% were aware of calorie information while purchasing a restaurant meal in the past month and, of those, more than a third reported it did not alter their order (Larson et al. 2018). Certain demographic variables predicted awareness, such as female sex, higher household income and educational attainment, and white race (Larson et al. 2018). Larson et al. (2018) highlighted that the very subgroups

at greatest risk of obesity and related chronic diseases (i.e., those with less income and formal education) were least likely to notice. Factors such as taste, cost, accessibility, and convenience are often more relevant to consumers than nutrition (Cantu-Jungles et al. 2017).

This legislation fundamentally ignores the central tenets of major health behaviour models, which stress that intentions are a primary predictor of behaviour change (Sheeran et al. 2016). Without intent to control one's eating, providing calorie information will have a negligible effect. Unsurprisingly, use of menu labels to limit calorie intake is associated with greater self-reported weight concern, as well as a greater likelihood of engaging in unhealthy weight-control behaviours (e.g., fasting/skipping meals, self-induced vomiting, laxative, and diuretic use) compared to healthy weight-control behaviours (e.g., exercising, eating more fruits and vegetables, watching serving sizes), and greater binge eating among women (Larson et al. 2018). Ergo, those with pathological eating or weight concerns, and thus more extreme intentions to control intake, are consequently expected to be more impacted by calorie labelling.

Menu calorie labelling can maintain and exacerbate ED symptomatology

EDs are severe mental illnesses characterized by psychopathological over-evaluation of shape, weight, and their control (Fairburn 2008) and significant disturbances in eating-related behaviour (Smith et al. 2018). Calorie counting often plays a predominant role and is taken to a degree far exceeding normal dieting (Fairburn 2008; Levinson et al. 2017; Smith et al. 2018). In Canada, approximately 3% of women are affected by an ED in their lifetime; however, subclinical eating pathology may be as high as 15%, particularly in adolescence (Lillico et al. 2015). EDs engender significant medical complications, elevated mortality, functional impairment, and lower quality of life (Smith et al. 2018), with poor treatment prognosis. Even interventions exhibiting the strongest empirical support demonstrate only partial effectiveness (Smith et al. 2018). Toulany et al. (2015) calculated the mean societal cost as \$54,932 per adolescent with anorexia nervosa admitted for inpatient treatment. The personal and public health costs of EDs are therefore substantial.

Some have postulated menu calorie labelling may benefit those with EDs. Haynos and Roberto (2017), for example, cite studies conducted using virtual restaurant environments which suggest those with EDs exhibit increases in negative affect and poor body image when dining out. Furthermore, those who engage in binge eating perceive restaurant meals as excessive and uncontrolled (Haynos and Roberto 2017). It is thus surmised that the provision

of calorie information may enhance perceived control and consequently reduce the stress associated with meals outside the home for those with EDs (Haynos and Roberto 2017). Notably, Roberto et al. (2013) found that those with self-reported disordered eating are in favour of menu labelling.

Desire for pathological control of eating is integral to ED psychopathology (Fairburn 2008; Smith et al. 2018), however. This frequently manifests in obsessive calorie counting whereby strict calorie limits are set and may decrease as the disorder progresses (Fairburn 2008). The adage “Less is more” pervading diet culture's caloric recommendations inadvertently substantiates the ED's perceived rationality. Although continued rumination about calories may increase feelings of control and attenuate fears of weight gain, it ultimately maintains characteristic restrictive eating patterns (Smith et al. 2018), and can heighten ED behaviours and clinical impairment (Levinson et al. 2017) by maintaining individuals' preoccupation with food and over-evaluation of control over eating (Fairburn 2008). Calorie counting also seems to act as a safety behaviour among those with EDs to manage fears about food and weight gain which, similar to safety behaviours in the context of anxiety disorders, maintains such fears (Kesby et al. 2017). Thus, evidence that those with EDs are in favour of menu calorie labelling cannot be taken as empirical justification for the absence of negative implications. Among individuals with EDs using calorie tracking mobile applications, 62.9% acknowledged tracking contributes at least moderately to their ED (Levinson et al. 2017). More frequent calorie counting is also associated with higher ED severity in university-aged females (Romano et al. 2018). Empirically-supported treatments indicate calorie counting is not conducive to recovery (Fairburn 2008; Smith et al. 2018). Enhanced cognitive behavioural therapy for EDs, for example, highlights the importance of actively discouraging calorie counting (Fairburn 2008).

Emerging evidence suggests menu calorie labelling can, in fact, exacerbate ED symptomatology. When hypothetical food orders were assessed, those with anorexia nervosa (AN) or bulimia nervosa (BN) ordered significantly fewer calories, while those with binge-eating disorder (BED) ordered significantly more when calorie labels were presented compared to when they were absent (Haynos and Roberto 2017). Though Lillico et al. (2015) found no adverse outcomes on eating disturbance or unhealthy weight-related behaviour from adding calorie labels in a university cafeteria in Ontario, the study was limited by a pre-post design measuring outcomes a mere week after adding labels. This restricted duration cannot ascertain the insidious onset of ED symptomatology or the extent to which ongoing behaviours were reinforced or maintained. Furthermore, the percentage of the sample classified as “high-risk” for an ED increased 2% from baseline to follow-up, suggesting slight elevation in self-reported ED

psychopathology (Lillico et al. 2015). Ergo, there is reasonable cause for concern in enhancing pervasive promotion of calorie-focused dieting for ED psychopathology. Nevertheless, it should be explicitly acknowledged that there have been no studies to date that have specifically examined the impact of menu labelling following the enactment of the *Healthy Menu Choices Act* on EDs or ED symptomatology, nor has research examined the policy's impact on food choices or obesity in Ontarians. Funding for further research is direly needed to evaluate the impact of menu calorie labelling on those with EDs and obesity. However, I contend that the widespread implementation of the *Healthy Menu Choices Act* across Ontario is misguided until the benefit of menu calorie labelling is more robustly supported and the absence of harm for those with EDs is empirically established. There may be value in repealing this policy in favour of low-risk alternatives.

Alternative low-risk policy options exist

While Block and Roberto (2014) note the requirement to disclose calories may inadvertently prompt the restaurant industry to reduce the calorie content of items, such reformulations often reduce fat content while increasing sodium, sugar, or refined carbohydrate content (Long et al. 2015). Thus, the overall nutritional quality is not necessarily improved (Long et al. 2015). Instead, placing legislative pressure on the food industry to serve reasonably portioned meals with greater nutritional value can expose institutions' shared responsibility and temper purely internal attributions for obesity, thus reducing stigma. Highlighting the importance of dietary composition on health outcomes associated with, though independent from, obesity may also enhance appreciation for nutrition as a means to promote holistic well-being, rather than solely for aesthetically-focused weight management.

Educational initiatives encouraging intuitive eating may be an ideal alternative to promote healthy eating behaviour. Intuitive eating is a weight-neutral alternative to weight-loss focused treatments that emphasizes using physiological hunger and satiety cues to regulate eating, granting oneself unrestricted permission to eat, and consuming foods the body craves for optimal functioning (Romano et al. 2018). Intuitive eating aims to improve health across the weight spectrum from a non-dieting perspective (Romano et al. 2018) and corresponds with less use of calorie labels (Larson et al. 2018). Intuitive eating is associated with lower BMI and has positive effects on cholesterol and triglyceride levels, systolic blood pressure, ED symptomatology, depression, body dissatisfaction, and self-esteem (Romano et al. 2018), suggesting benefits for obesity and related chronic diseases, as well as disordered eating.

Conclusion

Psychologists, health care professionals, and public health policy-makers arguably have an obligation to advocate change when a policy is both ineffective in its objective and ostensibly harmful to individuals' health. Considering the high mortality of EDs, suboptimal treatment outcomes (Smith et al. 2018), and ineffectiveness of calorie labelling (Cantu-Jungles et al. 2017; Long et al. 2015), it seems neither ethical nor reasonable to retain the *Healthy Menu Choices Act*. Notably, individuals with EDs often exhibit comorbid overweight/obesity (Romano et al. 2018) and caloric restriction can promote weight gain through associations with binge eating (Fairburn 2008). Minimizing the extent that obesity initiatives trigger, maintain, or exacerbate ED symptomatology is thus imperative. Further research is needed to derive theory-driven, empirically-established, and coordinated policies for obesity and ED prevention supporting healthy eating for *all* individuals while promoting a holistic view of physical *and* mental health.

Compliance with ethical standards

Conflict of interest The author declares she has no conflict of interest.

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