Results of national survey examining Canadians' concern, actions, barriers, and support for dietary sodium reduction interventions

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Abstract

Population-wide dietary sodium reduction is considered a priority intervention to address sodium-related chronic diseases. In 2010, the Canadian government adopted a Sodium Reduction Strategy to lower sodium intakes of Canadians; however, there has been a lack of coordinated action in its implementation. Our objective was to evaluate Canadians' concern, actions, reported barriers, and support for government-led policy interventions aimed at lowering sodium intakes. We conducted a survey among Canadians about sodium knowledge, attitudes, and behaviors. Data was weighted to reflect the 2006 Canadian census. Among 2603 respondents, 67.0% were concerned about dietary sodium and 59.3% were currently taking action to limit sodium intake. Those 50 to 59 years (Odds Ratio (OR)=1.79, 95% CI:(1.17, 2.72)) and 60–69 years (OR=1.63 95% CI:(1.05, 2.55)) were more likely to be concerned about sodium versus younger individuals (20–29 years), as were hypertensives versus normotensives (OR=4.13, 95% CI:(3.05, 5.59)). Older age groups and those with hypertension (OR=3.48, 95% CI:(2.58, 4.69)) were also more likely to limit sodium consumption. Common barriers to sodium reduction were limited variety of lower sodium processed (55.5%) and restaurant (65.8%) foods. High support for government-led actions was observed, including interventions for lowering sodium levels in processed (86.6%) and restaurant (72.7%–74.3%) foods, and in food served in public institutions (81.8%–82.3), also for public education (80.4%–83.1%). There was much less support for financial incentives and disincentives. In conclusion, these concerns, barriers, and high-level of support for government action provide further rationale for multi-sectoral interventions to assist Canadians in lowering their sodium intakes.

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The authors have no conflicts of interest.

INTRODUCTION

The majority of Canadians have sodium intake levels that exceed recommendations, a risk factor for several cardiovascular conditions. To address this issue, a federal government-appointed Sodium Working Group developed A Sodium Reduction Strategy for Canada.¹ Recommendations focused on the food supply, education/awareness, and research to achieve mean population intakes of 2300 mg/day by 2016.¹ Food supply recommendations were for structured voluntary sodium reductions in food, with the option for regulation should industry fail to reach targets. Except for the recent release of sodium reduction targets for the food industry and a public education campaign,² there is little known coordinated-action towards implementing the Strategy's 27 recommendations and presently no monitoring and evaluation framework exists.

We conducted a survey to assess Canadians' recent concern about sodium, and actions and barriers in limiting sodium consumption. Public opinion to a large degree influences the political agenda, and in light of the proposed federal Bill C-460, to legislate the implementation of the Strategy's recommendations, we also sought to determine Canadians' level of support, if any, for multi-sectoral sodium reduction initiatives.

METHODS

An online survey was administered in November-December 2011 to a longitudinal Canadian survey panel recruited to be representative of the Canadian population for age, sex, province and education (<http://consumermonitor.ca/>). English and French-speaking eligible participants were age 20 to 69 years, were a household grocery shopper (solely or in part), and had a computer with email access. Thirty thousand were sent an email to join the panel, and 6665 completed the baseline questionnaire. This present sodium survey was the ninth survey administered to this panel. Typically 2000–3000 responses were obtained per survey (data not yet published).

Questions were developed by sodium and/or consumer survey experts, or taken from similar national surveys.^{3, 4} Each question was plain language-reviewed and pilot-tested among a small group of participants from Guelph, Ontario and many questions were administered to a larger survey panel of Ontarians. Snap 10 Professional Survey Software and Webhost (Snap Surveys, Portsmouth, NH) were used for survey administration. Participants provided informed consent at the time of survey completion. Research ethics board approval was obtained from the University of Toronto and the University of Guelph.

Statistical Analysis

Data are presented as percentages and standard errors. A 5-point Likert scale was used (1=Not at all important/Strongly disagree, 5=Extremely important/Strongly agree). Responses of concern about sodium and action in limiting sodium intakes were dichotomized based on responses: "4 or 5"="concern"/"taking action" and "1 or 2 or 3"="no concern"/"not taking action". For barriers, responses were coded: "1 or 2"="not important"/"disagree"; "3"="neutral"; "4 or 5"="important"/"agree", "6"="not applicable". Rao-Scott chi-square tested the association between action and reported barriers.

Multivariable logistic regression was used to determine the relationship between action/concern and age, sex and blood pressure status. All estimates were weighted to be representative of the 2006 census population. $P < 0.05$ was considered statistically significant. SAS version 9.3 (SAS Institute, Cary, NC) was used for statistical analyses.

RESULTS

There were 2603 respondents, 65% of whom were women (Table S1). Respondents were slightly older and had a higher level of education compared to the 2006 Canadian census. One-fifth (20.9%) had been diagnosed with hypertension by a healthcare provider.

Concern

Most respondents (67.0%) were concerned about their sodium intake. Those 50–59 years (Odds Ratio (OR)=1.79, (95%CI: 1.17, 2.72)) and 60–69 years (OR=1.63 (95%CI: 1.05, 2.55)) were more likely to be concerned about sodium compared respondents aged 20–29 (Figure S1), as were hypertensives compared to normotensives (OR=4.13, (95%CI: 3.05, 5.59)).

Personal action

Many respondents (59.8%) felt that their health would improve if they lowered the amount of sodium in their diet, and 59.3% were actively trying to do so. Action towards limiting dietary sodium was more likely with each increasing age group, compared to the youngest group, and among hypertensives compared to normotensives (OR=3.48, (95% CI: 2.58, 4.69)(Figure S2). There were no differences between men and women.

Primary reasons for limiting, previously limiting, or interest in limiting sodium (78.2% respondents): to improve overall health (84.5%), because they heard they should (54.2%), to manage a health condition (38.2%), or a health professional recommended it (26.3%). While reasons for not limiting sodium (21.8% respondents): low or normal blood pressure (69.9%), overall good health (56.4%), a healthcare professional had not recommended it (36.6%), or don't like the taste of lower sodium foods (27.2%). Most respondents (77.4%) limiting their sodium intake were concerned about their sodium consumption; however, 43.6% of those not limiting their sodium intake were also concerned. Those concerned about high blood pressure (43.0%) were more likely to be taking action to limit sodium, compared to those not concerned about high blood pressure (71.9% versus 49.7%, $p < 0.001$).

Barriers

Significant barriers to limiting sodium were lack of lower sodium options among processed and restaurant (sit-down and fast-food) foods (Table). Only 15.5% and 12.4% correctly identified the recommended (1500 mg/day) and maximum (2300 mg/day) sodium levels, respectively. Most (72.5%) of those limiting sodium intake avoided consumption of high sodium foods. However, 45.9% of those admitted limiting sodium intake but *not* avoiding high sodium foods, and thought their sodium intake was low because they do not add salt to their food.

Sodium Reduction Interventions

Most respondents (80.2%) agreed that the food industry should lower the amount of sodium in the foods they produce. There was a high level of support for most sodium-reduction interventions (Table S2): government to work with the food industry to lower levels in processed foods (86.6%), set maximum levels for foods served in publicly funded institutions (81.8% to 82.3%), educational interventions (80.4% to 83.1%). However, there was less support financial incentives (29.1%) and disincentives (26.5%).

DISCUSSION

Two thirds of respondents were concerned about dietary sodium, which was greater in older people and in hypertensives. Over half of respondents were actively limiting their sodium intake, despite several misconceptions and inadequate knowledge of recommended sodium levels. We also found a very high level of support for almost all sodium reduction interventions, particularly for those targeting the food supply and consumer education. This was not surprising since the greatest barriers to sodium reduction were a lack of lower sodium processed and restaurant foods. These are all areas where strong government leadership is needed.

Our data complement existing evidence that highlights the need for interventions aimed at lowering sodium in the food supply. Over 80% of respondents felt that the food industry should reduce the amount of sodium added to prepared and packaged food, which is explained by respondents' reported barriers to sodium reduction. This is relevant since the majority of dietary sodium is derived from packaged and prepared foods. Health Canada data has shown it is practically impossible to consume sodium intakes <2300 mg/day following Canada's Food Guide, due to the high amounts of sodium in the food supply.⁵ Unfortunately, there has been minimal action on the Strategy's 10 food supply-focused recommendations. Although Health Canada recently published sodium reduction benchmarks to guide food manufacturers in reducing sodium levels, no such targets exist for the restaurant sector. Additionally, without a coordinated national monitoring and evaluation program, which Canada does not have, the food industry cannot be held accountable to these targets, nor can their successes be measured.

Approximately half of our respondents were actively limiting their sodium intake. However, food intake or urinary excretion data would be required to verify actual adherence with sodium recommendations. Our data revealed several concerns and misconceptions. First, many were not limiting their sodium intake because they had low or normal blood pressure and overall good health, contradicting the literature demonstrating benefits of sodium reduction in normotensives. Second, over one-quarter of respondents who were actively limiting sodium were not actually restricting consumption of high sodium foods - many thought they consumed low amounts of sodium because they did not add salt to their food. Additionally, few individuals were aware of the actual sodium recommendations. Whether these findings support the need for, or highlight the ineffectiveness of educational interventions is unknown; however, they demonstrate the need for other types of interventions, such as those targeting the food supply.

Our population may not reflect the entirety of the Canadian population. Although data were weighted, respondents had a higher education level and were slightly older than the Canadian population, however this is typical of survey methodologies. We also only included household grocery shoppers. Although the response rate was relatively low in contrast to the number of respondents who completed the baseline survey (39.1%), it is comparable to other surveys administered to this longitudinal survey cohort, and the sample size remains much larger than other national surveys.³

In summary, a large proportion of respondents were concerned about dietary sodium, and the most significant barriers to sodium reduction were high sodium levels in packaged and prepared foods. We found a very high level of support for sodium reduction interventions, particularly for the food supply and education/awareness. This data provide further evidence supporting the need for multi-sectoral sodium reduction initiatives, to assist Canadians in lowering their sodium intakes to levels consistent with dietary recommendations.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

Acknowledgments

Funding

This study was funded by the Canadian Institutes for Health Research and the Canadian Stroke Network. Dr. Arcand holds a Research Fellowship from the Heart and Stroke Foundation of Canada. Dr. Lou holds a Canada Research Chair in Statistical Methods for Health Care. Dr. L'Abbe holds the Earl W. McHenry Chair at the University of Toronto.

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Table

Reported barriers to limiting sodium intake: those taking action to limit sodium versus those who are not

	Not taking personal action			Taking personal action			P value action vs. no action
	Disagree (%)	Neither Agree nor Disagree	Agree (%)	Disagree (%)	Neither Agree nor Disagree	Agree (%)	
There is not enough variety of low-sodium processed foods	28.7 (2.1)	23.4 (2.0)	35.3 (2.2)	19.6 (1.2)	18.2 (1.3)	55.5 (1.6)	<0.0001
It is hard to understand sodium information on food labels	47.3 (2.3)	20.2 (1.8)	26.5 (1.9)	46.6 (1.6)	19.8 (1.2)	31.7 (1.5)	0.0003
I don't know how/lack of information	47.8 (2.3)	22.3 (1.9)	21.8 (2.0)	58.8 (1.6)	20.4 (1.3)	14.9 (1.1)	0.0002
A lack of support from my family/friends makes reducing sodium difficult	62.0 (2.2)	14.7 (1.6)	6.6 (1.1)	69.9 (1.5)	11.4 (1.1)	8.2 (1.1)	0.0011
Only one person in my household wants to/needs to lower their sodium intake. It's too much trouble for one person to eat lower sodium.	55.8 (2.3)	13.8 (1.7)	5.9 (1.0)	70.7 (1.5)	8.5 (1.1)	7.2 (0.8)	<0.0001
Lack of willpower	41.3 (2.3)	21.8 (2.1)	23.1 (1.9)	61.2 (1.6)	16.6 (1.2)	16.2 (1.3)	<0.0001
Low sodium food products don't taste as good, compared to regular products	31.1 (2.0)	28.6 (2.2)	33.5 (2.2)	49.7 (1.6)	24.2 (1.3)	23.5 (1.3)	<0.0001
I don't know how or don't like to cook	69.2 (2.1)	12.7 (1.7)	13.0 (1.4)	79.1 (1.3)	8.1 (1.0)	8.6 (0.9)	0.0003
I don't always have time to prepare low sodium meals/meals from scratch	51.8 (2.3)	16.3 (1.8)	26.4 (2.1)	57.6 (1.6)	14.7 (1.1)	25.0 (1.4)	0.0158
The price difference between low-sodium and regular foods is too high for me	54.9 (2.3)	20.4 (1.8)	12.6 (1.6)	61.2 (1.6)	18.9 (1.3)	11.6 (1.0)	0.0426
When eating at fast food restaurants, I find that lower sodium options are not available or only in limited variety	10.1 (1.5)	17.1 (1.7)	54.4 (2.3)	7.6 (0.8)	10.1 (1.0)	65.8 (1.5)	<0.0001
When eating at sit-down restaurants, I find that lower sodium options are not available or only in limited variety	12.7 (1.4)	23.6 (2.1)	51.2 (2.3)	11.6 (1.1)	16.7 (1.1)	65.2 (1.5)	<0.0001

Data presented as percentage (standard error of percentage). Subjects had the option of choosing "not applicable" for each barrier, which makes up the difference in the percentages. These individuals were included in the analysis. The Rao-Scott chi-square test was used to test the association between barriers and personal action.