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ORIGINAL ARTICLE

Public health strategies promoting physical activity and healthy eating in Canada: are we changing paradigms?

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Abstract
Objectives To compare the extent to which Canadian public health organizations incorporated the Ottawa Charter for Health Promotion action areas in promoting physical activity and healthy eating in 2004 and 2010.
Methods Data were available from repeat censuses of all regional, provincial, and national organizations with mandates to promote physical activity [$n = 134$ (2004); $n = 118$ (2010)] or healthy eating [$n = 137$ (2004); $n = 130$ (2010)]. Eleven strategies to promote these behaviors were grouped according to the five action areas. Descriptive analyses were conducted to document the level of involvement in each action area over time.
Results The proportion of organizations promoting physical activity and "heavily involved" in creating supportive environments increased from 51 % (2004) to 70 % (2010). The proportion also increased for reorienting health services (29 % to 39 %). The proportion of organizations promoting healthy eating and "heavily involved" in building healthy public policy increased from 47 to 53 %. Individual skill building remained stable for physical activity but declined for healthy eating.
Conclusions While developing personal skills remains important in promoting physical activity and healthy eating in Canada, public health organizations increased involvement in structural-level strategies.

Keywords Public health · Health promotion · Physical activity · Healthy eating · Chronic disease prevention · Ottawa Charter

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Introduction

In 1986, the Ottawa Charter for Health Promotion (WHO 1986) introduced an action framework for use by public health organizations to improve the health of populations. It identified three strategies (*advocate*, *mediate*, *enable*) and five action areas (*build healthy public policies*, *reorient health services*, *strengthen community action*, *create supportive environments*, *and develop personal skills*) as foundational to modern public health practice and policy. To maximize impact, the Ottawa Charter also promoted use of multi-level action strategies that combine complementary structural (i.e., environmental) and individual behavior components. In Canada, the decades that followed

the introduction of the Ottawa Charter saw major changes in: the education and training of public health professionals with the creation of several schools of public health and initiatives to develop workforce competencies in public health (Mowat and Moloughney 2004; F/P/T Joint Task Group on Public Health Human Resources 2005); public health research funding; and organizational infrastructure and legal mandates (e.g., restructuring of the health system in many provinces, creation of the Public Health Agency of Canada in 2004) (Lewis and Kouri 2004; Public Health Agency of Canada Act 2006), which have fundamentally transformed public health practice across the country.

In the context of these changes and faced with escalating obesity and a concomitant increase in the chronic disease burden, federal and provincial governments and regional public health authorities in Canada reformulated their primary prevention/healthy living strategies to guide public health programming targeting physical activity and healthy eating—lifestyle behaviors that are key to reversing current trends in obesity and preventing chronic disease (WHO 2003; Bungham et al. 2003; Koh-Banerjee et al. 2003). The Ottawa Charter has figured prominently in guiding these reformulations over the last 10 years (e.g. British Columbia Ministry of Health Services 2005; Ontario Ministry of Health and Long-Term Care 2007). Other relevant developments included a growing evidence base on the limitations of individually focused behavioral interventions (Swinburn et al. 2005) and effectiveness of environmental and policy interventions in the prevention of obesity and chronic disease (Kumanyika et al. 2008), the creation of mechanisms for intergovernmental collaboration, and the establishment of six National Collaborating Centers for Public Health (Medlar et al. 2006) to promote knowledge synthesis and transfer. However, whether all these changes resulted in better use of the Ottawa Charter strategies and action areas in public health practice is largely unknown.

While the Charter has influenced health promotion discourse and practice (Potvin and Jones 2011), Hancock (2011), and Kickbusch (2007) suggest that it has not been as widely implemented as hoped, leaving individualistic and biomedical models predominant (Low and Thériault 2008). To date, promoting individual lifestyle change has been the target of most physical activity and healthy eating efforts, even though these behaviors are shaped by a broad and complex range of environmental, social, economic, and cultural factors [i.e., the social determinants of health (SDH)]. Improving population levels of physical activity and healthy eating requires a comprehensive approach that combines a variety of strategies and balances "upstream" and "downstream" interventions (WHO 1986; Sallis and Glanz 2009), with the former addressing policy at a population-level through regulation, increased access or economic incentives, and the latter addressing individual behaviors (Brownson et al. 2010).

While the Ottawa Charter is widely recognized as pivotal in shaping public health in Canada, few studies systematically document the extent to which it has been incorporated into public health programming by organizations in the public health system. In this paper, we compare the extent to which Canadian public health organizations incorporated the five action areas of the Ottawa Charter into programming to promote physical activity and healthy eating in 2004 and 2010. We also describe the use of multiple strategies to enact implementation of health promotion programs.

Methods

The Public Health Organizational Capacity Study (PHORCAST) is a repeat census of all organizations involved in chronic disease prevention (CDP) and/or health promotion at the regional, provincial, and national levels in Canada. One census was conducted in 2004, and another in 2010 (Hanusaik et al. 2007, 2010, 2014). In each census, organizations were identified in an exhaustive internet search. Province-specific lists of organizations were then validated for completeness by prominent CDP researchers across Canada. Organizations with mandates for population-wide primary prevention of chronic disease (i.e., diabetes, cancer, cardiovascular diseases, and chronic respiratory illness), healthy lifestyle promotion, or with a focus on healthy eating, tobacco control or physical activity participated. The response proportion was 96 % in 2004, and 90 % in 2010. Participating organizations included regional health authorities and public health units or agencies, government departments, national health charities and their provincial or district divisions, other non-governmental and non-profit organizations, para-governmental health agencies (defined as agencies financed by a government, but acting independently of it), resource centers, professional organizations, and 'grouped' organizations such as coalitions, partnerships, and alliances. Organizations primarily involved in secondary or tertiary prevention of chronic disease, advocacy, allocation of funds, fund-raising, facilitating joint efforts among organizations, and research or knowledge transfer were not eligible. The term 'organization' referred to an entire organization, if the organization as a whole conducted CDP activities, or to a specific department, unit or division within an organization if only a certain subunit of the organization undertook CDP activities.

Data were collected in structured telephone interviews conducted by nine trained interviewers with one key informant per organization identified by a senior manager

as the person within the organization most knowledgeable about implementation and delivery of CDP programs, practices, campaigns, or activities. Staff turnover is expected within organizations, and the key informant in many of the organizations participating in both surveys differed across time. Since all data have been anonymized, we are not able to report the proportion of key informants who responded in both 2004 and 2010. However, the methodology used to select the individual was consistent across census waves—key informants were selected based on knowledge of CDP programming, not on organizational position. To reduce the complexity of the task required of our key informants, we: (1) restricted the focus of inquiry to the division/unit/department that was directly implicated in CDP programming implementation; and (2) we provided copies of the questionnaire in advance of the structured interview, encouraging our informants to consult with colleagues before the actual interview. The current analysis pertains to the 134 and 137 organizations which, in 2004, reported activities that specifically targeted physical activity or healthy eating, respectively, and the 118 and 130 similar organizations in 2010. Organizations that incorporated physical activity ($n = 69$ in 2004; $n = 62$ in 2010) or healthy eating ($n = 63$ in 2004; $n = 53$ in 2010) into multi-risk factor programming were excluded, because the wording of the questionnaire items and response choices did not permit us to isolate the physical activity or healthy eating components.

The study was approved by the Institutional Review Board of the Faculty of Medicine, McGill University, the Comité d'éthique de la recherche du Centre hospitalier de l'Université de Montréal (CRCHUM), and the Research Ethics Office of the University of Alberta.

Study variables

Level of involvement in physical activity or healthy eating activities was measured by: "Does your organization do any [*physical activity/healthy eating*] activities that address [*physical activity/healthy eating*] alone, without any other risk factor?" Those responding yes answered the following question about specific intervention strategies: "How would you rate your organization's level of involvement in [*physical activity/healthy eating*] activities using the following strategies?" Level of involvement in 11 strategies (i.e., group development, public education, skill building at the individual level, healthy public policy development, advocacy, partnership building, community mobilization, facilitation of self-help groups, service provider skill building, creating healthy environments, and volunteer development) was assessed using a 5-point scale, where '1' is very low involvement, and '5' is very high involvement. These specific strategies were drawn from existing questionnaires designed to survey health promotion practices in public health organizations, and represent common approaches used to increase healthy eating, reduce tobacco use, and increase physical activity [(Naidoo and Wills 2000, unpublished survey instruments: Canadian Heart Health Initiative—Ontario Project (CHHIOP) 1996 Survey of Capacities, Activities, and Needs for Promoting Heart Health (SCAN) of Community Agencies, CHHIOP 1997 SCAN of Public Health Units, Saskatchewan Heart Health Program 1998 Annual Survey of Health Promotion Contacts, Ontario Health Promotion Resource System 2002 Ontario Health Promotion Capacity Survey)]. In the 2010 PHORCAST questionnaire (Online Resource), we added social marketing, influencing the built environment and using social media technologies to the list of strategies. However, to allow for comparison with the 2004 responses, these three strategies were not included in our analysis. Respondents were instructed to consider work done with and without partnering with other organizations. If no programming was conducted using a specific strategy, organizations were assigned a score of '1'.

Level of involvement using multiple strategies was measured by summing scores across the 11 implementation strategies [scores ranged from 11 (if the organization indicated '1' or very low involvement in all strategies) to 55 (if the organization indicated '5' or very high involvement in all strategies)], and categorizing the sums into five groupings based on quintile, with 1 = least intensely involved in multiple strategies (sum 11–20); 2 = less intensely involved (sum 21–28); 3 = moderately involved (sum 29–36); 4 = highly involved (sum 37–44); 5 = very highly involved (sum 45–55).

In this current study, we used the Ottawa Charter as the conceptual underpinning to categorize the 11 strategies into five action areas, while recognizing that certain strategies, such as advocacy and public education, are cross-cutting and, therefore, could be categorized into different action areas depending on the context. According to this approach (WHO 2005; Alberta Health Services 2010), two action areas were described by a single strategy. Specifically *create supportive environments* comprised one item (creating healthy environments strategy) and *reorient health services* comprised one item (service provider skill-building strategy). *Build healthy public policy* action area comprised two items (healthy public policy development and advocacy strategies). Separate factor analyses were undertaken for subsets of items selected to measure the other two action areas to confirm unidimensionality and internal consistency. Specifically, *develop personal skills* comprised three items (group development, public education, and skill building at the individual level) and *strengthen community action*

comprised four items (partnership building, community mobilization, volunteer recruitment/development, and facilitation of self-help groups). In these analyses, unidimensionality was confirmed, and the internal consistency, as measured by Chronbach's alpha, ranged from 0.68 to 0.74, respectively. It was not possible to confirm unidimensionality or internal consistency for action areas comprising <3 items. Responses for the items in action areas with more than one item were summed and averaged so that responses ranged from 1 to 5.

Data analysis

To describe the level of involvement in the five Ottawa Charter action areas and in multiple strategies, the proportion of organizations which reported the highest levels of involvement (i.e., '4' or '5' on the 5-point scale herein labeled "heavily involved") was compared in 2004 and 2010. Because the number of organizations was small in some provinces, comparisons across time were conducted at a national level. Significance testing was not relevant, since data were collected in a repeat census (not samples) of all CDP organizations in Canada. Data from organizations that participated in both census waves and from all new organizations in 2010 were included in the analytic database. Data analyses were conducted using SAS software, version 9.2 (SAS Institute Inc., Cary, NC).

Results

The number of organizations in Canada at the national, provincial, and regional levels that implemented programs aimed at the primary prevention of chronic disease or healthy lifestyle promotion (i.e., CDP organizations included in the PHORCAST census) declined slightly over time, from 216 in 2004 to 197 in 2010. This decline in the total number of public health organizations engaged in CDP (2004–2010) may be attributed, in part, to restructuring in the regional healthcare system that took place in several Canadian provinces during that period (Hanusaik et al. 2014). Table 1 presents selected characteristics of participating organizations. While fewer organizations were engaged in CDP programming in 2010 compared to 2004, the proportion engaged in single-focus physical activity or healthy eating programming remained stable (62.5 % in 2004 vs. 63 % in 2010). The number of organizations in Canada at the national, provincial, and regional levels that implemented programs aimed at these behaviors declined slightly over time, from 134 in 2004 to 118 in 2010 for physical activity, and from 137 to 130 for healthy eating.

Physical activity programming

In 2004, 51, 43, and 42 % of organizations which reported programming for physical activity were heavily involved in 'creating supportive environments,' 'building healthy public policy', and 'developing personal skills', respectively (Fig. 1). While the proportion of organizations heavily involved in building health policy increased to 53 % in 2010, the greatest increases were reported for creating supportive environments, which increased to 70 % in 2010, and for reorienting health services which increased from 29 % in 2004 to 39 % in 2010. There was no change over time in the proportion of organizations heavily involved in developing personal skills, strengthening community action or using multiple strategies concurrently in physical activity programming.

Healthy eating programming

'Creating supportive environments', 'building healthy public policy', and 'developing personal skills' were the most prevalent action areas for promoting healthy eating in 2004. The proportion of organizations heavily involved increased notably in only one area, namely 'building healthy public policy', which increased from 47 % in 2004 to 53 % in 2010 (Fig. 2). The proportion of organizations heavily involved in 'developing personal skills' decreased in this time period (from 49 to 42 %). Similarly, the proportion of organizations heavily involved in 'strengthening community action' declined from 29 to 24 %. There was no important change in the proportion of organizations using multiple strategies for promoting healthy eating.

In secondary analyses restricted to organizations in which physical activity ($n = 69$ in 2004; $n = 62$ in 2010) was incorporated into multi-risk factor programming, the trends for building healthy public policy, re-orienting health services, and strengthening community action were the same as in single-focus organizations. However, the results for developing personal skills and creating supportive environments differed in that the proportion of organizations heavily involved increased. Similarly, in analyses restricted to organizations in which healthy eating ($n = 63$ in 2004; $n = 53$ in 2010) was incorporated into multi-risk factor programming, the trend for building healthy policy was the same as in single-focus organizations, but differed for all other action areas in that the proportion of organization that were heavily involved increased.

Discussion

Amid debate in the literature on the degree to which the principles of the Ottawa Charter have been implemented in

Table 1 Characteristics of chronic disease prevention (CDP) organizations in Canada, 2004 and 2010

	2004[a], $N = 216$	2010, $N = 197$
Age (years), median (IQR)	28 (7–51)	30 (12–57)
Type of organization, %[b]		
Formal public health	48	50
NGO	25	28
Grouped organization	19	13
Other	7	8
Geographic area served, %		
Region	71	58
Province	24	34
Multi-province/territory	2	4
Canada	3	4
Level of CDP activity, %		
Division/unit	58	73
Entire organization	42	27
No. full time equivalents, median (IQR)		
Organizations housing CDP units	150 (69–850)	200 (52–1000)
CDP units housed in larger organizations	15 (7–35)	17 (8.8–46)
Organizations entirely engaged in CDP	3 (1–11)	2.5 (1–7)
Size of population served, %		
<50,000	13	15
50,000–99,999	16	11
100,000–199,000	24	15
200,000–499,999	13	14
>500,000	33	45
Target population		
General	91	85
Specific health problem	59	43
Specific demographic group	69	60
Specific region	51	33

IQR interquartile range

[a] Fifty-four percent ($n = 117$) of the 216 organizations that participated in the study in 2004 were the same in 2010

[b] Formal public health = formally mandated regional public health units/agencies or regional health authorities/districts; NGO = non-governmental organizations; grouped = coalitions, partnerships, and alliances; other = resource centers, federal/provincial government departments, para-governmental agencies, professional associations

Canada (Raphael et al. 2008; Bryant et al. 2011), this study provides some of the first empirical evidence on the extent to which public health organizations across Canada have incorporated these principles into programming to promote physical activity and healthy eating. Our data provide evidence that the approach in the areas of physical activity and health eating promotion is changing.

In 2004, the three most prevalent strategies to promote physical activity and healthy eating among Canadian public health organizations included a combination of "upstream" (i.e., creating supportive environments and building healthy public policy) and "downstream" strategies (i.e., developing personal skills). In 2010, these areas remained dominant, but our results suggest a reorientation within that mix. Among organizations promoting physical activity, 'creating supportive environments' became the foremost strategy, with 70 % of organizations heavily involved. This finding is consistent with the important role that the built environment plays in shaping access to opportunities for physical activity (Raine et al. 2008; Ding and Gebel 2012), and recognition among researchers and practitioners of the need to change environments first to allow educational interventions to be effective (Sallis et al. 2012).

Among organizations promoting healthy eating, the notable increase in involvement in 'building healthy public policy' and the decreased involvement in 'developing personal skills' represent an important shift which may signal a rebalance away from the predominance of behavioral interventions of the past few decades (Alvaro et al. 2010). While nutrition education (individually focused or through media campaigns/promotions) remains an important strategy (Raine 2010), more intersectoral action that addresses the broader social and economic factors promoting 'passive over-consumption' (Blundell and King 1996) of energy-dense, low-nutrient foods is urgently needed. Such structural interventions do not rely on individual uptake, and contribute to health improvements in an equitable manner across social subgroups (Lorenc et al. 2013).

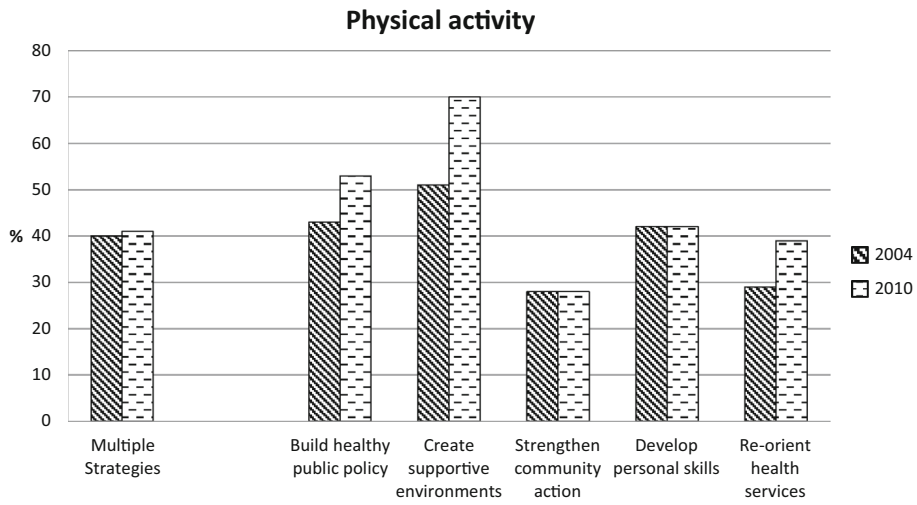

Fig. 1 Proportion of Canadian public health organizations heavily involved* in physical activity programming using multiple strategies and according to Ottawa Charter action areas, Canada, 2004–2010

*Proportion reporting 'high' and 'very high' involvement among those specifically targeting physical activity (n=134 (2004); n= 118 (2010)).

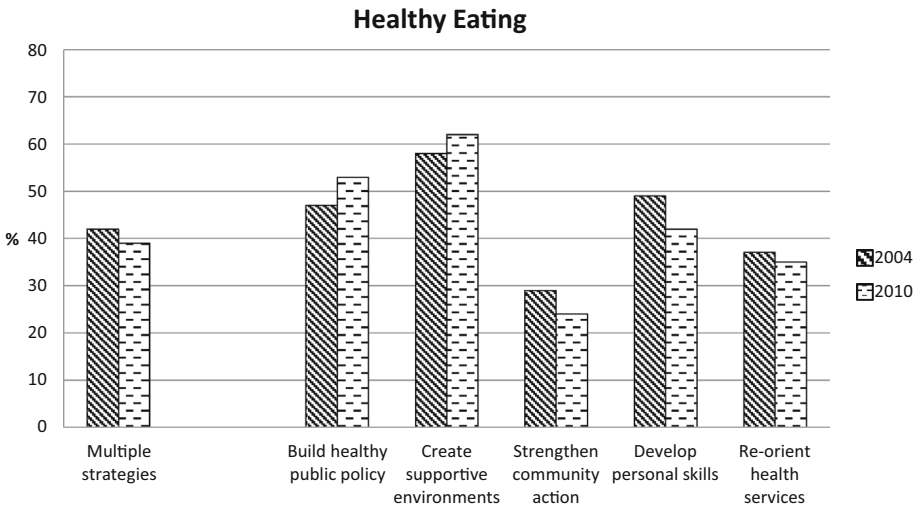

Fig. 2 Proportion of Canadian public health organizations heavily involved* in healthy eating programming using multiple strategies and according to Ottawa Charter action areas, Canada, 2004–2010

*Proportion reporting 'high' and 'very high' involvement among those specifically targeting healthy eating (n=137 (2004); n= 130 (2010)).

This research points to another novel finding with respect to the Ottawa Charter—the proportion of organizations engaged in promoting physical activity that were heavily involved in 're-orienting health services' increased from 29 to 39 % from 2004 to 2010. Among the five action areas of the Ottawa Charter, 're-orienting health services' has received the least attention in Canada as elsewhere and has been dubbed the "sleeping giant of health promotion" (Wise and Nutbeam 2007). To date, access, quality, and sustainability of services have dominated the discourse around the role of health services in maintaining the health of the population (Health Council of Canada 2013), and the potential contribution of health services to primary prevention of chronic disease and health promotion has been designated a relatively low priority. An exception is in the area of tobacco control where systematic screening and intervention for smoking cessation has been scaled up in primary care settings (Ottawa Model for Smoking Cessation 2014; Tremblay et al. 2009) The extent to which the efforts of the public health organizations participating in this study resulted in enhanced integration of the promotion of physical activity into clinical practice is unknown. However, physicians and other health care professionals can play an important role in motivating and assisting behavior change (Whitlock et al. 2002), and integrating physical activity screening and counseling into primary health care systems is seen as one of several "best investments" needed to

increase population levels of physical activity (Bull et al. 2010).

Strengths and limitations

The main limitations inherent to studies contributing to the emerging field of public health services and systems research (Scutchfield and Ingram 2013) include limited longitudinal data, use of measures based on key informant report, and small numbers of participating organizations. This study is one of few that compares census data over time, which is a particular strength. Ideally, organizational level constructs should be assessed using objective measures, but "key informant-report" is the most common method of data collection in organizational research (Podsakoff and Organ 1986). In this study, we interviewed one key informant per organization. Key informants were those 'most knowledgeable about CDP within the organization', and therefore, their responses likely reflected physical activity and healthy eating programming reliably. Small numbers of organizations in some provinces precluded provincial comparisons, and the national level results may not capture provincial variations despite being based on census data. Finally, the collection of qualitative data that would have allowed a more detailed picture of evolving practice in these organizations and contributed to the evidence found in this study was not feasible within this census of organizations.

Since physical activity and healthy eating confer substantial protection against obesity and chronic disease, public health has a vital role in their promotion and in addressing the conditions in which people live and work that shape their lifestyle choices (i.e., SDH). Although we present evidence of a 'shift' toward more 'upstream' action in physical activity and healthy eating programming, this study raises important questions for future inquiry: What types of activities are being conducted in each action area? What role does local context play in the kinds of strategies selected? What organizational characteristics or other factors influenced physical activity or healthy eating programming to move 'upstream'? Building on the work of Raphael et al. (2014), systematic inquiry into the experiences of selected public health organizations with varying SDH-related approaches and SDH-related organizational structures is needed to better understand how the Ottawa Charter action areas are implemented in different regions or contexts for physical activity and healthy eating.

Conclusion

Among organizations that promoted physical activity and healthy eating in Canada in 2010, there was more emphasis on structural 'upstream' strategies and less emphasis on strategies targeting individual behavior change than in 2004. Continued monitoring of organizations in Canada's public health system is needed to facilitate evidence-based reflection on optimal strategies to support healthy choices and alleviate the burden of chronic disease.

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Compliance with ethical standards

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Conflict of interest The authors declare that they have no conflict of interest.

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