Physical Activity Information Seeking and Advertising Recall

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Abstract

The purposes of this research were to examine the characteristics of those who look for physical activity-related information, where they find it, and to examine what types of physical activity-related advertisements are recalled (i.e., publicly funded or commercial). These purposes were tested using secondary data analyses from two population health surveys. Results from the first survey (N = 1211) showed that gender, age, education, and activity level differences in who is more likely to search for physical activity-related information. Adding the goal of being active into the model made age and activity level no longer significant but gender and education remained significant factors. The Internet was the most often cited source of physical activity information. The second survey (N = 1600) showed that adults 55 years of age or older and participants with the least amount of education were more than twice as likely to name commercial advertisements than were participants aged 18 – 54 years or those with more education. These results help further our understanding of how publicly funded promotional campaigns fare against commercial advertising and also highlight the need to understand physical activity information seeking behaviour on the Internet and its implications for health promotion.

Seeking and recall of physical activity information and advertising

The general goal of mass-market health promotion campaigns is to increase the amount of information available on a particular health topic (Randolph & Viswanth, 2004). Mass media physical activity (PA) marketing campaigns are often used to help set the public health agenda with the aim of countering trends towards physical inactivity (Bauman, Smith, Maibach, & Reger-Nash, 2006). However, several papers have critically examined the role of media in social advertising, and the authors have identified areas in which we know little of how health promotion campaigns fare in an increasingly complex media context. For example, how commercial advertisements for PA-related products and services may compete with public service health promotion campaigns is not well understood (Randolph, & Viswanth, 2004). One manifestation of this competition is that commercial advertisements may draw attention away from health promotion advertisements (Maibach, 2007). The

likelihood that attention will be drawn away from publicly funded advertisements by commercial advertisements is high because the number of commercial marketers of exercise products and services is far greater than non-commercial marketers (Maibach, 2007; Berry, McCarville & Rhodes, 2008). Commercial marketers therefore largely control the frame through which PA is discussed. Commercial advertisements focus on brand recognition and purchasing behaviour and thus purchasing a product or service can become analogous with the notion of “exercise” rather than PA (Berry et al., 2008).

Another consideration is the rapidly burgeoning media environment where in addition to traditional media such as magazines, newspapers and television, the Internet is now accessible to most North Americans (Maibach, 2007). The media chosen by health promoters is an important issue because it may be that time spent with one media such as the Internet will take time away from time spent with other media such as television and newspapers (Kayany & Yelsma, 2000). However, Dutta-Bergman (2004) has proposed that rather than media displacement, it is media complementarity that guides information seeking behaviour across different media. That is, if someone is interested in a certain subject, he or she will search for information about the topic across various media. Indeed, Dutta-Bergman showed that participants who searched for online news about various topics such as health, sports, politics, and business also searched for such information in traditional media. Research is necessary to determine whether media displacement or complementarity occurs for individuals who search for PA-related information. How PA-related public health information is disseminated can also be considered through the knowledge-gap hypothesis which states that as mass media is introduced into society, those with more education will acquire knowledge faster than those with less education (Tichenor, Donohue, & Olien, 1970). This occurs because people with more education are better able to manage communication, have more prior knowledge about a topic, have broader social networks, and pay more attention to public health education campaigns (Bonfadelli, 2002; Weenig & Midden, 1997). Bonfadelli (2002) also showed that income contributes to the knowledge gap due to computer-related costs such as hardware and service providers. Related to this issue, a variety of contextual and personal factors have been shown to influence health information seeking and use including demographic, socioeconomic, information environment, health status, and motivation (Weenig & Midden, 1997). For example, Gilleard and Higgs (2008) argued that the “digital divide” of Internet use that exists between seniors and younger adults is due to generational differences in uptake of new technologies rather than differences in cognitive abilities or “stage of life”. The knowledge-gap hypothesis should also be considered when comparing commercial and publicly funded campaigns as there may be demographic differences among who searches for and recalls different types of PA-related information and who does not.

A useful framework for examining respective awareness and influence of commercial and publicly funded PA-related advertisements is the Hierarchy of Effects Model. This model developed out of advertising theory that described the cascade of effects that might occur after exposure to advertising (Bauman et al., 2006; Flay, 1987). Bauman et al. used the framework to outline steps to take when evaluating the impact of physical activity media campaigns. The first step is to establish if there are proximal (immediate) effects, such as awareness of the advertisements or messages. At the next, more distal level, cognitive

mediator variables such as beliefs regarding the behaviour, and changes in attitudes or intentions as a result of the message should be assessed. Finally, at the most distal (end point) level the interest is in whether a change in behaviour has occurred as a result of the media campaign. An evaluation of the VERB PA campaign aimed at youth in the United States showed that awareness and understanding were the key effects that led to behaviour change (Bauman et al. 2008). The Hierarchy of Effects Model does not directly address possible demographic differences in awareness and other variables. However, in light of the knowledge gap hypothesis it is important to examine differences among various demographic groups. For example, seniors rely on physicians and television for nutrition information, particularly if the seniors are of low income (McKay, Houser, Blumberg, & Goldberg, 2006). Low income seniors also reported that the quality of information from television is inconsistent and the messages are further confused by the influence of commercial advertisements (McKay et al., 2006). Thus, an assessment of the wider media environment would be a valuable addition to our understanding of PA-related advertising awareness.

Given these questions, the purposes of this research were to examine (a) the demographic and psychosocial characteristics of those who seek PA-related information and for those looking for it, where they find the information; and, (b) what type of advertisement (e.g., commercial, publicly funded) comes to mind when participants are asked to name advertisements about PA. For the first purpose we hypothesized that active participants would be more likely to search for information regarding PA because they have more motivation and prior knowledge of the topic. Further, we hypothesized that those who seek PA-related information will do so across multiple channels (based on media complementarity theory; Dutta-Bergman, 2004). Since the second purpose statement was more of an exploratory question, we made no a priori hypotheses. However, we expected to conduct post hoc analyses determine demographic differences between respondents who named commercial or public health advertisements.

These objectives were tested using secondary data analyses from two random-digit dial population health surveys. The first survey was a biennial provincial survey of various behaviours, including PA. Questions within this survey addressed the first purpose because participants were asked whether they looked for PA information and if so, where they go to for such information. The second survey was conducted to evaluate televised advertisements promoting PA and healthy eating. This survey asked participants to name televised PA advertisements and was therefore used to address the second purpose.

Study 1

Method

The questions used in this research were part of a larger survey that took about thirty minutes to complete. In addition to demographic and PA-related questions (further outlined in the measures section), the survey included questions about topics such as voting behavior, genetic testing, and climate change. This research was conducted with ethical approval from the appropriate institutional ethics board and participants provided verbal informed consent before the questionnaire was administered.

Participants—Participants were selected by a random-digit dialing method and included a sample of 1,211 adults (males = 602; females = 609) aged 18 years and over residing in the province of Alberta, Canada. The sampling frame was all persons who live in Alberta that can be contacted by direct dialing. Telephone numbers were randomly generated so that participants had an equal chance of being contacted regardless of whether their number was unlisted or listed in the telephone directory (Population Research Laboratory, 2008). Data were collected in the months of May – June 2008 using a computer-assisted telephone interviewing system. Data were weighted to compensate for sample sizes in three categories - Edmonton, Calgary, and “the rest of Alberta,” as these were not proportional to the Alberta population they represent. The estimated sampling error for this sample of households was within $\pm 2.8\%$, at the 95% confidence level (Population Research Lab, 2008). The overall response rate was 28.5%, calculated by dividing the number of completed interviews ($N = 1211$) by the sum of completed interviews, incomplete interviews ($N = 26$), refusals ($N = 2901$), and language problems ($N = 106$). The demographic nature of the sample is reflective of the population of Alberta in terms of all variables, including activity level (Burgess, Berry & Spence, 2007), with the exception of education level. Our sample was more highly educated with 35.7% (see Table 1) of the sample having a university education compared to 26.6% for residents of Alberta in general (Statistics Canada, 2008). Similarly, 7.3% of our sample were in the lowest education group compared to approximately 15% for Alberta. The data available from Statistics Canada is only for those aged 25 to 64 years. However, it is still estimated that our sample is more highly educated.

Measures

Demographic data regarding gender, age, education, and income were collected. For the following questions, regular physical activity was defined for participants as: “activity that is done at least 4 times per week, for at least 30 minutes at a time or a total of 30 minutes accumulated throughout the day, and at a moderate effort.”

Physical Activity Information—Participants were also asked “Do you ever look for information about PA?” with a simple yes/no response option. Those who responded yes were then asked an open-ended question: “What is your preferred source for physical activity information?” These questions were developed for this research.

Psychosocial variables—Based upon previous research (Rodgers & Sullivan, 2001), a coping self-efficacy score was derived by summing the respondents’ ratings on four items assessing their confidence in overcoming respectively: fatigue, bad weather, bad moods, and time constraints to participating in moderate leisure time physical activity (LTPA). These questions were rated on a 5-point Likert-type scale with the following possible answers: 1 (Not at all), 2 (Slightly), 3 (Somewhat), 4 (Quite) and 5 (Completely). This measure showed adequate internal consistency ($\alpha = .85$). Outcome expectations were derived by summing the respondents’ ratings on two items assessing their belief that moderate LTPA will keep them healthy and will reduce their chances of getting serious health problems (Plotnikoff, McCargar, Wilson, & Loucaides, 2005). The same Likert-type scale as for coping self-efficacy was used. The Pearson correlation for these two items was $r = .58, p < .001$ and

internal consistency was $\alpha = .72$. The goal to be physically active was measured with one item rated on the same scale: “It is my goal for the near future to participate in regular PA.”

Leisure-Time Physical Activity—The Godin Leisure-Time Exercise Questionnaire (Godin & Shephard, 1985) was used to estimate LTPA. These authors showed adequate two week test-retest reliability of this measure which has also been shown to provide reliable and valid estimates of physical activity in the Canadian context (Godin, Jobin, & Bouillon, 1986). Self-reported weekly frequencies of strenuous, moderate, and mild activities were multiplied by their estimated value in METs (nine, five, and three respectively) as suggested by the author (Godin, n.d.). Total weekly LTPA was calculated by adding the products of the separate components. Participants were considered sufficiently physically active if they expended 38 METs a week for men or 35 METs a week for women (Garcia Bengoechea, Spence, & McGannon, 2005). According to Garcia and colleagues, achieving these cutoffs is approximately equivalent to doing 120 minutes of moderate physical activity during a week which is consistent with Canadian physical activity guidelines (Public Health Agency of Canada, 1998). Based on this criterion, we created a dichotomous variable for LTPA: inactive or active.

Data Analysis

Responses to the open-ended “preferred source for PA information” question were initially coded by one research assistant. With consultation with a researcher, fifteen categories (see Table 2) were created for the open-ended responses. Most of the categories are self-explanatory, however a few need clarification. For example, “community” responses included responses such as “community center ads”. Fitness professionals included personal trainers, coaches, and gym instructors. Health professionals included physicians, nurses, physiotherapists, pharmacists, and health centres. The social network category included friends, family members, and coworkers. Examples of responses coded as “other” include responses such as “it’s just random” or where the respondent did not understand the question (e.g., “gardening mostly”). After the initial coding, inter-rater reliability was checked by having the researcher who helped determine the initial codes code a random sample of 25% of the first responses (156 responses). There was excellent inter-rater reliability as defined by Altman (1991) with a Kappa value of 0.89, $T(156) = 24.28, p < .001$.

Simple descriptive statistics are reported regarding whether participants looked for PA-related information or not. This dichotomous variable was then examined in a logistic regression with odds ratios to determine the unique contributions of demographic characteristics (age (grouped into 6 categories as shown in Table 1), gender, education) and activity level on whether they looked for information or not. Income was not included because 26% of participants refused to answer the question. Psychosocial variables were included in the second step.

To examine the concept of media complementarity (Dutta-Bergman, 2004), the number of different media cited in response to the question “where do you go for PA information” was calculated. The maximum number of responses given was five (e.g., a participant named television, newspapers, magazines, the Internet and community resources as sources of PA

information). Responses were then categorized by media and whether that media was cited by participants or not (e.g., how many participants said they got PA information from the Internet in any of their responses compared to those participants who did not mention the Internet). The mean number of responses was calculated for the respondents who had and had not cited the medium (e.g., the mean total number of responses for participants who cited magazines as a source of PA information was 2.12 and the mean total number of responses for participants who did not cite magazines was 1.30). T-tests were then calculated for each media category between those who had cited the category and those who had not with the mean number of responses as the dependent variable. Because ten tests were calculated, a Bonferroni adjustment was made so that a more conservative significance test of $p < .005$ was used ($1/10 * .05$). The categories tested were: books, community resources, gyms and recreation centres, health practitioners, internet, magazines, newspapers, pamphlets, social network and television. Categories were excluded from the t-tests because of too few responses (e.g., universities), because the categories were too broad (e.g., libraries where participants could look at magazines, books, or the Internet), or were in the “other” category.

Results

Six hundred and twenty-nine participants (51.9%) responded that they look for information regarding PA. Five hundred and seventy-six (47.6%) reported not looking for PA information and six other participants either did not respond or said they didn't know. There were 78 (6.4%) cases with missing data from the demographic or psychosocial variables, leaving 1133 participants in the logistic regression analysis. Bivariate correlations between variables included in this analysis ranged from .02 to .47, the VIF values were from 1.04 to 1.477, and the lowest tolerance score was .70 indicating that multicollinearity was not an issue. Table 1 presents the results of the logistic regression showing the characteristics of people who report looking for PA information and those who do not. In the first step, women were twice as likely as men to search for PA information. Further, those who were active were 1.5 times more likely than inactive participants, and those in the highest education group were 1.73 times as likely as those in the lowest education group to search for PA information. In the second step, for each increase in the agreement with the statement “It is my goal for the near future to participate in regular PA” the odds of looking for PA information increased by a factor of 1.53. The inclusion of the goal variable in the model resulted in physical activity being no longer significant so that those who were active were no more likely to look for PA information than were those who were not active, although gender and education remained significant factors.

Six hundred and twenty-five participants (51.6%) gave at least one response to the question “Where do you go for PA-related information?” Four respondents indicated that they look for PA-related information but said they did not know where. Table 2 shows the various categories of responses given by participants and the t-test results. The most often cited media was the Internet. However, participants who cited the Internet did not name a greater number of media sources overall compared to participants who did not cite the Internet. Similarly, participants who cited health professionals as a source did not have a greater number of media sources than did participants who did not seek out PA information from

health professionals. However, for all other media sources, those who cited a particular media had a greater number of overall sources than did those who did not cite that source. Thus, the idea of media complementarity was supported for books, community resources, gyms and recreation centres, magazines, newspapers, pamphlets and brochures, social network and television but not for the Internet or health practitioners.

A series of binary logistic regressions for each media type on demographic and psychosocial variables (e.g., cited Internet versus did not cite Internet) were conducted to further explain these findings. For parsimony of space only the significant findings (using significance level $p < .01$) are reported here. Participants over the age of 65 were significantly less likely to cite the Internet as a source when compared to all other age groups (all p values $< .001$) but participants over the age of 65 were also 16.6 times more likely to cite newspapers as a source than were participants in the youngest age group ($p < .001$). Also, participants in the 55–64 year old category were 9.6 times more likely to cite newspapers than were younger participants. The goal to be physically active was also a significant factor in the odds of looking for information on the Internet ($p < .001$), in magazines ($p < .01$), and newspapers ($p < .005$). There were no other notable findings.

The results of this study aid in increasing understanding of the characteristics of people who look for PA-related information and through which media. However, these results did not address the issue of competing commercial advertisements. Therefore, the purpose of the second study was to explore this issue by asking a free-recall question of PA advertisements in an effort to determine if publicly funded or commercial advertisements are better recalled.

Study 2

Participants—One thousand six hundred Albertans participated in the study with an oversampling of individuals older than 55 (45.1% of the total sample; $n = 721$) as they were the target audience for the televised health promotion advertisements being evaluated in the larger research study. Data were collected in the months of November and December, 2007 and January 2008 using a computer-assisted telephone interviewing system. The overall response rate (completed surveys divided by the sum of completed surveys, refusals [$n = 1543$], incompletes [$n = 8$], language problems [$n = 130$], and callbacks [$n = 176$]) was 46.3%. This research was conducted with ethical approval from the University of Alberta and participants provided verbal informed consent before the questionnaire was administered.

Measures

The questions from the larger survey relevant to this research include: “do you recall seeing any PA advertisements on television from the last few months” which had a simple dichotomous yes/no response option. If participants indicated they could recall any advertisements they were asked to name up to two. This “unprompted recall” question (Bauman, Bellew, Owen & Vita, 2001) was used because the purpose of the entire survey was to evaluate televised health promotion campaigns. Thus, unprompted recall is the first step to see if the advertisements were recalled by any participants. Outcome expectations

were measured using the same questions and answer scale as in Study 1. Behavioral intentions (Plotnikoff, et al., 2005) were measured by asking participants to rate on an 11-point Likert scale ranging from “0%” to “100%: “How likely is it that you will get regular PA within the next month?” As in Study 1, LTPA was measured using the Godin Leisure Time Exercise Questionnaire (Godin & Shephard, 1985). The same criteria were used to classify participants as active and not active.

Data analysis

The responses to the open-ended question regarding having seen any televised PA advertisements were very wide-ranging. Data were initially categorized into 22 codes by one research assistant in consultation with the principal investigator. A second research assistant was then given a sample of 25% of the responses from each question to test for inter-rater reliability. Because some codes were not used by both raters kappa values could not be computed. However, correlations of the ratings were .83. The codes were then collapsed into the broader categories of publicly funded PA advertisements (e.g., *Healthy U*, *ParticipACTION*), commercial PA advertisements (e.g., exercise equipment brands such as *Bowflex*), general reference to PA (e.g., people walking), other (e.g., cereal with those walk things), not relevant (e.g., *Jenny Crai*), and references to television (e.g., TV show such as *The Biggest Loser*). The collapsed categories had good inter-rater reliability as defined by Altman (1991) with Kappa values of 0.79, $T(171) = 20.20$, $p < .001$. Six hundred and thirty-five participants (39.7% of total sample) gave at least one response and an additional 117 participants (7.3%) provided two responses (i.e., could name two advertisements).

For the rest of the analyses only the first responses given that were categorized as either publicly funded or commercial were used (397 responses) because we wanted to compare these groups across demographic and psychosocial variables using a logistic regression.

Results

Two hundred and sixteen participants (54.4% of the first responses) first mentioned a publicly funded PA advertisement. One hundred and eighty-one participants (45.6%) first mentioned commercial advertisements. Bivariate correlations between variables included in this analysis ranged from .003 to .493, the VIF values were from 1.02 to 1.41, and the lowest tolerance score was .70 indicating that multicollinearity was not an issue. The results of the logistic regression are reported in Table 3. It was found that adults over the age of 55 years were more than twice as likely to name commercial advertisements compared with those aged 18 – 54 years. Further, participants who had completed university, college or high school were much less likely to name commercial advertisements than were participants who had never completed high school. Although none of the psychosocial variables were significant there was a trend toward lower outcome expectations for those participants who named commercial advertisements ($p = .06$).

Among the second set of responses, 42 participants (35.9%) cited a commercial PA advertisement and 19 (16.2%) cited a publicly funded advertisement. This small number of responses precluded a logistic regression on these data because there are seven predictors in this model which requires a minimum sample size of 97 for a medium effects size (Green,

1991). However, in an effort to replicate the results of the regression on the first set of responses, we ran a series of chi-square analyses on the second responses by demographic variables. As with the first set of responses, there was a significant difference in age, $\chi^2 = 11.36$, $p < .001$, with older adults more likely to name commercial advertisements than publicly funded advertisements. Indeed, of the 22 participants over the age of 55 years who gave a second response, 21 named a commercial advertisement. There was no significant education difference, $\chi^2 = 2.15$, $p > .05$. However, only three participants in the lowest education group gave a second response, all of which were commercial advertisements. There was also no significant gender difference, $\chi^2 = 3.42$, $p > .05$. Differences in psychosocial variables were measured with t-tests and there were no significant differences between participants who cited commercial versus publicly funded advertisements for self-rated health, $t(59) = .06$, $p > .05$, outcome expectations, $t(59) = .23$, $p > .05$ or intentions, $t(59) = .30$, $p > .05$.

Discussion

The results of Study 1 showed gender, education, and age differences between those who look for PA-related information and those who do not. Self-efficacy and outcome expectations did not predict who looked for information which may be due to the specificity of the coping self-efficacy (e.g., fatigue as barrier) and outcome expectation (i.e., health) measures. What type of information was specifically looked for, whether it was for tips to overcome barriers, more information on the health benefits, or myriad other reasons, is unknown. However, it was found that participants who indicated that their goal was to start PA in the near future were more likely to look for PA-related information. This resulted in age and activity level being no longer significant, although differences in information seeking between genders and levels of education remained significant. Thus, the knowledge-gap hypothesis was supported for PA-related information – better educated participants, regardless of their activity level were more likely to seek out PA-related information.

The results from Study 2 aid in further understanding this issue by showing that participants who had not finished high school were more likely to name commercial advertising than were participants who had completed high school or university. The older group was also more than twice as likely to name a commercial advertisement than were the younger participants. This may be because seniors and people with less education watch more television than younger people (Statistics Canada, 2007). Commercial advertisements greatly outnumber public health advertisements (Maibach, 2007). Public service PA messages must compete with commercial advertisements of exercise products and services which rely on brand recognition and attempts to influence purchasing behaviour rather than conveying information (Maibach, 2007; Berry et al., 2008). This is problematic because individuals who are not actively engaged in processing a message may be persuaded by the number of arguments presented, thus providing an advantage for the commercial advertisers (Petty, Priester & Brinol, 2002). Prior knowledge and motivation interact with level of education to influence attention paid to mass media information campaigns (Weenig & Midden, 2002). These results have implications for health promotion because of the process of cultivation, whereby bias in the media may result in a skewed perception of reality among consumers (Maibach, 2007). Thus, participants who recall commercial advertising may be

more likely to associate being active with a certain product or way of appearing. There is a paucity of research examining commercial advertisements (Maibach, 2007) although there is some evidence that commercial advertisers, at least in print advertising, use more attention-grabbing features (Berry et al., 2008). Further research is necessary to understand how better to attract the attention to public health advertisements.

The results from Study 1 also showed no differences between education groups in Internet usage although the Internet was by far the most popular source for PA-related information. However, we do not know what online sources of information were accessed. Bonfadelli (2002) showed differences between education groups in the type of information sought on the Internet, therefore further research is needed to examine what PA-related information is available on the Internet and if there are demographic differences in access. For example, visitors to the *Canada on the Move* website (a public-private partnership of pedometers distributed through cereal boxes with an accompanying website where participants could enter pedometer data), were largely middle-aged women, and about half of all visitors had a university degree (Plotnikoff et al., 2006). However, although some analysis has been done on the depictions of PA in traditional media such as magazines (e.g., Berry et al., 2008), we are unaware of any analyses of what information is available on the Internet. There are many public health sites (see Maibach, 2007 for a review), but whether these are the type of sites most likely to be accessed is unknown and the efficacy of these sites is questionable. Doshi, Patrick, Sallis and Calfas (2003) evaluated PA websites focused on behaviour change and found that although there were some exceptional sites, overall there was little use of theory and the sites primarily gave general information, goal-setting strategies and suggestions for social support. Further, it may be that the majority of people search for information on popular sites such as MSN or Yahoo which may focus on appearance or other non-health related motivators. Though challenging, we suggest that researchers try to understand the quantity and nature of PA information available on the Internet given that it is the primary source of information for many people.

The results of Study 1 also supported the idea of media complementarity across many media (e.g., magazines, television) but not the Internet which is contrary to the findings of other researchers (Kayany & Yelsma, 2000; Dutta-Bergman, 2004). Our results also contradict those of Tian and Robinson (2008) who found that participants who search for cancer-related information on the Internet also seek information about cancer through more traditional media. Dutta-Bergman (2004) showed age differences between online users and nonusers of various topics, but not for health and science information. However, participants in our study who were in the oldest age group were much less likely to search for PA-related information on the Internet and were far more likely to search for information using newspapers. This may be because physical activity is not considered in the same health category as other behaviours but further research is needed to explore this idea. Other researchers have reported that only 15% of those over 65 years reported using the Internet to find health-related information, compared to 43% of those aged of 18–35 years (Bansil, Keenan, Zlot, & Gilliland, 2006). Thus, demographic differences should be further explored with respect to the media complementarity hypothesis, particularly when the Internet is used.

There are many strengths of this research including the random-digit dialing protocol and large, representative samples. However, several limitations should be addressed. First, both surveys were cross-sectional, therefore causation cannot be determined. The low response rate in study 1 (28%) is also a limitation because selection bias may skew the sample towards those already interested in the topic. We also relied on self-report for measures of PA. An additional consideration is how participants defined “physical activity” for themselves in our surveys. Though PA is generally defined as any movement that results in energy expenditure and exercise is defined as structured PA with the goal of increasing fitness (Bouchard & Shephard, 1994), whether this distinction is made by the general public remains to be determined. For example, people tend to know more about traditional PA (e.g., aerobics classes) than lifestyle PA which is more often the focus of health promotion campaigns (Morrow, Krzewinski-Malone, Jackson, Bungum, & Fitzgerald, 2004). Thus, whereas other researchers have found evidence of media complementarity when looking for health information, it may be that the variety of ways in which “physical activity” can be defined affected the results of this research. A final limitation is that it is possible that there were public health campaigns ongoing during data collection and thus influenced recall of advertising.

In conclusion, health promoters are advised to consider the needs of men or those with less education when considering to whom to promote PA. As Weenig and Midden (1997) wrote, “should one be able to increase attention for campaigns among the lower educated, the problem of an increasing knowledge gap between lower and higher segments of the population might be diminished or even avoided” (p. 957). Our research showed demographic differences in who searches for PA-related information, where they search for it, and what advertisements are first recalled when asked about PA-related advertising. These results further our understanding of how publicly funded promotional campaigns fare against commercial advertising. This research also highlights the need to understand information seeking behaviour on the Internet and its implications for health promotion.

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Table 1

Odds ratios (95% confidence interval) of looking for physical activity-related information by demographic groups and psychosocial variables.

	Variable (n; percent of total sample)	Step 1 - demographic	P value	Step 2 - includes psychosocial variables	P value
Gender	Male (n = 567; 50%)	1.00		1.00	
	Female (n = 566; 50%)	2.03 (1.60 – 2.59)	.000	1.98 (1.54 – 2.54)	.000
Education	Less than high school (n = 83; 7.3%)	1.00		1.00	
	High school or technical (n = 646; 57.0%)	1.59 (1.20 – 3.63)	.09	1.62 (.93 – 2.83)	.09
	University complete (n = 404; 35.7%)	1.73 (1.01 – 1.70)	.03	1.71 (1.04 – 2.82)	.04
Age	18 – 24 years (n = 77; 6.8%)	1.00		1.00	
	25 – 34 years (n = 166; 14.7%)	0.90 (.51 – 1.60)	.72	0.88 (.49 – 1.57)	.66
	35 – 44 years (n = 230; 20.3%)	0.94 (.55 – 1.63)	.83	.092 (.53 – 1.61)	.78
	45 – 54 years (n = 256; 22.6%)	0.80 (.47 – 1.37)	.42	0.83 (.48 – 1.43)	.50
	55 – 64 years (n = 205; 18.1%)	0.56 (.32 – .97)	.04	0.58 (.33 – 1.02)	.06
	65 years and older (n = 199; 17.6%)	0.55 (.31 – .96)	.04	0.62 (0.35 – 1.10)	.10
Activity level	Not active (n = 492; 43.4%)	1.00		1.00	
	Active (n = 641; 56.6%)	1.55 (1.21 – 1.99)	.001	1.23 (.94 – 1.63)	.14
Self-efficacy				0.95 (.84 – 1.09)	.49
Outcome expectations				0.79 (.89 – 1.09)	.99
Goals				1.53 (1.33 – 1.76)	.000

Categorization of responses to unprompted recall question “preferred source of PA-related information”, the mean number of responses for those who cite or do not cite a given category and t-test results comparing the two groups for each category

Table 2

	1 st response	2 nd response	3 rd response	4 th response	5 th response	Total	M responses cited
Books	14	9	3	1	0	27	2.26
community resources	26	12	1	0	2	41	2.07
fitness and sport professionals	11	4	1	0	0	16	-
gym and recreation centres	44	21	9	0	0	74	1.88
Health practitioners	19	4	0	0	0	23	1.43
Internet	287	15	4	1	0	307	1.45
Library	3	9	0	0	0	12	-
Magazine	58	32	7	0	1	98	2.12
Newspaper	66	28	13	2	0	109	2.02
Other	19	8	7	1	0	35	-
pamphlets & brochures	29	24	9	2	0	64	2.02
Radio	0	3	2	0	1	6	-
Social network	31	19	6	2	0	58	1.93
Television	14	15	3	2	0	34	2.35
Universities	4	1	0	0	0	5	-
Total	625	204	65	11	4	909	

* $p < .005$

** $p < .001$

Odds ratios (95% confidence interval) of citing a commercial advertisement over a publicly funded advertisement by demographic and psychosocial variables.

Table 3

	Step 1 - demographic	P value	Step 2 - includes psychosocial variables	P value
Gender				
Female (n = 207)	1		1	
Male (n = 190)	1.23 (0.80 – 1.90)	.34	1.22 (0.80 – 1.91)	.35
Less than high school (n = 34)	1		1	
Education				
High school or technical (n = 224)	0.28 (0.12 – 0.70)	.006	0.25 (0.10 – 0.62)	.003
University complete (n = 139)	0.18 (0.07 – 0.45)	.000	0.15 (0.06 – 0.39)	.000
Age				
18 – 54 years (n = 241)	1		1	
> 55 years (n = 156)	2.37 (1.49 – 3.67)	.000	2.38 (1.51 – 3.75)	.000
Activity level				
Active (n = 244)	1		1	
Not active (n = 153)	1.06 (0.68 – 1.63)	.80	1.01 (0.62 – 1.68)	.97
Self-rated health				
Outcome Expectations				
Intentions				
			0.85 (0.66 – 1.08)	.18
			0.83 (0.69 – 1.01)	.06
			1.10 (0.94 – 1.09)	.75