Implementation strategies to reduce the burden of low back pain

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Chapter 2

Long-term evaluation of a Canadian back pain mass media campaign

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ABSTRACT

Purpose: This paper evaluates the long-term impact of a Canadian mass media campaign on general public beliefs about staying active when experiencing low back pain (LBP).

Methods: Changes in beliefs about staying active during an episode of LBP were studied using telephone and web-based surveys. Logistic regression analysis was used to investigate changes in beliefs over time and the effect of exposure to campaign messaging.

Results: The percentage of survey respondents agreeing that they should stay active through LBP increased annually from 58.9% to ~72.0%. Respondents reporting exposure to campaign messaging were statistically significantly more likely to agree with staying active than respondents who did not report exposure to campaign messaging (adjusted OR, 95% CI = 1.96, 1.73 - 2.21).

Conclusion: The mass media campaign had continued impact on public LBP beliefs over the course of 7 years. Improvements over time were associated with exposure to campaign messaging.

INTRODUCTION

According to the recent Global Burden of Disease Study, low back pain (LBP) remains one of the most prevalent disorders [1] and the leading cause of disability worldwide, accounting for 83 million disability adjusted life years in 2010.[2] Clinical practice guidelines indicate that management of recent onset non-specific back pain should focus mainly on reassurance of the patient and advice to stay active to address misconceptions about LBP and avoidance beliefs.[3] An overview of Cochrane Reviews indicated physical activity and exercise is an intervention with few adverse events that may improve chronic back pain severity, physical function, and consequent quality of life.[4] However, general public beliefs about back pain appear pessimistic and widespread misconceptions are held (e.g. need for rest and activity avoidance when experiencing back pain)[5-7] which has led to population-based interventions aimed at improving beliefs, such as mass media campaigns.[8-10]
A back pain mass media campaign based on a successful Australian campaign [11-14] was undertaken and evaluated by Alberta's Workers' Compensation Board (WCB) and partners to improve back pain beliefs in the general public in Canada.[15] Specific messages focused on the importance of staying active during an episode of LBP, with the theme of *Back Pain: Don't Take it Lying Down*. After the first three years, evaluation indicated the campaign had a modest impact on general public beliefs specific to campaign messaging. The percentage of respondents agreeing with the statement "If you have back pain you should try to stay active" increased in the intervention population of Alberta from 55.5% in 2005 to 63.4% in 2008 ($p = 0.008$) with no change observed in the control population of Saskatchewan (consistently ~60%).

Given the positive influence on public beliefs, the campaign continued to be administered to the entire Alberta population by the organizers with annual bursts of campaign activity ever since. We evaluated the long-term impact of this campaign on general public back pain beliefs up to 7 years after the end of the original study, hypothesizing that back pain beliefs would continue to improve over the years.

MATERIALS AND METHODS

Design

This was a repeated cross-sectional population survey without a control group. For program evaluation purposes, WCB-Alberta continued to collect annual data on public beliefs using population surveys. Surveys were conducted annually between 2010-2014 by Leger Marketing, and between 2014-2015 by Advanis Inc., both experienced polling firms. The methods of the initial campaign have been reported elsewhere [15]. WCB-Alberta provided access to the survey data collected since 2010, which included beliefs and several demographic characteristics of the survey population. The University of Alberta's Health Research Ethics Board approved this study.

Campaign Description

Starting in May 2005, WCB-Alberta and partners undertook a mass media campaign with the primary objective of educating adult Albertans about back pain and the advantages of staying active (see www.backactive.ca). Information was provided using various communication strategies to modify existing public beliefs that back pain requires rest. The initial three years of the campaign were previously evaluated as discussed above, with modest improvements observed in public beliefs about activity during back pain episodes in Alberta and no corresponding improvements in a control population. Given these promising results, the sponsors continued with annual bursts of campaign activity. The core theme of the campaign *(Back Pain: Don't Take it Lying Down)* continued to be used in a variety of media formats including; website, radio, bus ads, billboards, posters, promotional materials, and public service announcement television spots. Targeted messaging (posters, information sheets, and other promotional materials) was also provided to workplaces at high risk of back pain claims. The campaign reflected a balance of paid and free initiatives to maximize exposure within a limited budget.

Study population

Between 2010 and 2015, 11,637 randomly selected Alberta residents aged 18-65 years were surveyed. Leger Marketing collected data using Computer-Assisted Telephone Interviews (n=4,500) and web-based surveys (n=5,072). The telephone surveys were conducted in January 2010 (n=900), January 2011 (n=900), July 2013 for the year 2012 (n=900), November 2013 for the year 2013 (n=900) and May 2014 (n=900). Web-based surveys were conducted in January 2010 (n=1,002), January 2011 (n=1,066), July 2013 for the year 2012 (n=1,002), November/December 2013 for the year 2013 (n=1,001) and May 2014 (n=1,001). Respondents to the telephone interviews were randomly selected while the web-based surveys were not random (i.e. self-selected respondents to the online survey). Advanis Inc. conducted web-based surveys in December 2014 (n=1,064) and December 2015 (n=1,001) (not random, i.e. self-selected respondents).

Measures

Among other items, the surveys contained the key belief question item from the original campaign surveys regarding staying active with back pain. Respondents were asked their level of agreement (from 1-Completely Disagree to 5-Completely Agree) with the statement "If you have back pain you should try to stay active". Leger presented this statement to all survey respondents, while Advanis asked this item in only half of their surveys. The other half was asked their level of agreement on a reversed statement, i.e. "If you have back pain, you should not stay active, you should take rest". For the purpose of comparison to the previous study, only responses to the original item were used and responses were dichotomized by combining the agree options (4 and 5) into one category and disagree options (1 and 2) into a second category with the neutral option (3). The proportion of respondent agreement with the stay active statement in each survey wave was considered our primary outcome measure.

The surveys also inquired about respondents' exposure to campaign messaging, asking whether they recalled seeing or hearing any advertising that specifically states *"Back pain: Don't take it lying down"* or advising that it is important to stay active through back pain. Leger Marketing asked about both types of advertising in 1 item while Advanis asked about these exposures in 2 separate items. Both Advanis items were analyzed separately and in 1 combined item. In both the telephone and web-based surveys, questions about campaign exposure were asked after the question about agreement with staying active during back pain to avoid influencing responses. Furthermore, the surveys contained basic descriptive information regarding characteristics of the study population. This included age category, sex, educational level, employment situation, occupation, marital status, geographical region, and type of survey (phone or web-based). Data on current or previous back pain were not collected since these were not important confounders in the earlier campaign evaluation.[15]

Data analysis

Descriptive statistics were used to describe the study sample characteristics and to summarize agreement with the statement concerning staying active over the survey waves. Pearson Chi-Square tests were performed to examine differences in agreement of the 'stay active' statement across survey waves and between agreement of the 'stay active' statement and reported exposure to campaign messaging. Bootstrapping with 1000 samples was used to calculate 95% confidence intervals on the percentage agreement estimates. To account for covariates, logistic regression analysis was performed. However, due to the non-random, web-based only sample from Advanis data, and the fact that these data were very different from the Leger data; only the Leger data were analyzed using regression analysis.

Independent variables in the logistic regression model included survey type, survey wave, reported exposure to campaign messaging, and other demographic variables. The depend-

ent variable was agreement of the 'stay active' statement (Yes or No). Variables significant at $p<0.05$ in univariate analysis were then entered into the final multivariable model. We examined for effect modification, confounding, and relevant regression assumptions.[15] For all analyses, significance levels were set to a p-value of <0.05. All analyses were conducted using IBM SPSS Statistics 23.0 (Armonk, New York).

RESULTS

Sample Characteristics

Characteristics of survey respondents across waves for the Leger data are shown in Table 1. Most respondents were between 45-54 years of age and slightly more were female, with a slight decrease over the years in the number of male respondents. Data on educational level, marital status, and income category were not available from Advanis, but the population appears comparable between the 2 polling firms on other measures. Most Advanis survey respondents were between 55-64 years of age (28.2%), with 56.2% of respondents being female. Most Advanis survey respondents were employed full time (74.9%) and had occupations in the government/education sector (18.6%).

Table 1. Survey population characteristics (Leger)

	Leger 2010 (n=1,902) N (%)	Leger 2011 (n=1,966) N (%)	Leger 2012 (n=1,902) N (%)	Leger 2013 (n=1,901) N (%)	Leger 2014 (n=1,901) N (%)	Leger average 2010-2014 (n=9,572) N (%)
Age category						
18-24	125 (7.1)	68 (3.7)	94 (5.0)	84 (4.4)	76 (4.5)	447 (4.9)
25-34	287 (16.2)	268 (14.4)	199 (10.5)	209 (11.0)	212 (12.5)	1175 (12.9)
35-39	184 (10.4)	170 (9.1)	223 (11.8)	221 (11.7)	135 (7.9)	933 (10.2)
40-44	193 (10.9)	325 (17.4)	296 (15.6)	279 (14.8)	291 (17.1)	1384 (15.2)
45-54	444 (25.1)	441 (23.7)	331 (17.5)	331 (17.5)	365 (21.4)	1912 (21.0)
55-64	322 (18.2)	346 (18.6)	408 (21.6)	400 (21.2)	415 (24.4)	1891 (20.7)
65+	215 (12.1)	244 (13.1)	341 (18.0)	367 (19.4)	208 (12.2)	1375 (15.1)
Not reported	*132*	*104*	*10*	*10*	*199*	*455*
Sex						
Female	991 (52.1)	1084 (55.1)	1087 (57.2)	1087 (57.2)	1022 (53.8)	5271 (55.1)
Not reported	*0*	*0*	*0*	*0*	*0*	
Educational level						
Elementary (<7yrs)	26 (1.4)	29 (1.5)	19 (1.0)	21 (1.1)	17 (0.9)	112 (1.2)
High school, general or professional (8-12yrs)	506 (27.0)	496 (25.5)	512 (27.3)	505 (27.1)	426 (22.6)	2445 (25.9)
College, pre-university, technical training, certificate (CEP)	608 (32.4)	617 (31.7)	566 (30.2)	584 (31.3)	580 (30.8)	2955 (31.3)
University certificates and diplomas	128 (6.8)	144 (7.4)	148 (7.9)	174 (9.3)	170 (9.0)	764 (8.1)
University Bachelor	440 (23.4)	479 (24.6)	419 (22.4)	392 (21.0)	471 (25.0)	2201 (23.3)
University Masters	137 (7.3)	140 (7.2)	161 (8.6)	161 (8.6)	168 (9.0)	767 (8.1)
University Doctorate (PhD)	32 (1.7)	40 (2.1)	48 (2.6)	30 (1.6)	50 (2.7)	200 (2.1)
Not reported	*25*	*21*	*29*	*34*	*19*	*128*
Employment situation (only asked in web-based survey)						
Employed full-time	341 (39.1)	385 (44.2)	301 (34.6)	291 (33.4)	349 (39.9)	1667 (38.2)
Employed part-time	121 (13.8)	110 (12.6)	122 (14.0)	119 (13.7)	117 (13.3)	589 (13.5)
Homemaker	80 (9.2)	79 (9.0)	78 (9.0)	89 (10.2)	58 (6.6)	384 (8.8)
Retired	256 (29.4)	222 (25.5)	316 (36.3)	323 (37.1)	291 (33.2)	1408 (32.3)
Unemployed	50 (5.7)	58 (6.7)	39 (4.5)	30 (3.4)	38 (4.3)	215 (4.9)
Student	24 (2.8)	18 (2.0)	14 (1.6)	19 (2.2)	24 (2.7)	99 (2.3)
Not reported	*130*	*194*	*132*	*130*	*124*	*710*

Continued Table 1. Survey population characteristics (Leger)

	Leger 2010 (n=1,902) N (%)	Leger 2011 (n=1,966) N (%)	Leger 2012 (n=1,902) N (%)	Leger 2013 (n=1,901) N (%)	Leger 2014 (n=1,901) N (%)	Leger average 2010-2014 (n=9,572) N (%)
Occupation						
Office worker	159 (8.5)	144 (7.7)	153 (8.9)	133 (7.8)	135 (7.9)	724 (8.2)
Personnel specialized in sales	71 (3.8)	78 (4.2)	71 (4.1)	62 (3.6)	74 (4.3)	356 (4.0)
Personnel specialized in services	113 (6.1)	100 (5.3)	95 (5.5)	70 (4.1)	82 (4.8)	460 (5.2)
Manual workers	71 (3.8)	67 (3.6)	47 (2.7)	64 (3.7)	47 (2.7)	296 (3.3)
Skilled, semi-skilled workers	143 (7.7)	138 (7.4)	94 (5.5)	93 (5.4)	100 (5.8)	568 (6.4)
Science and technology workers	77 (4.1)	77 (4.1)	62 (3.6)	52 (3.0)	66 (3.8)	334 (3.8)
Professionals	281 (15.1)	311 (16.6)	240 (14.0)	230 (13.4)	241 (14.0)	1303 (14.7)
Managers/administrators/ owners	238 (12.8)	199 (10.6)	144 (8.4)	151 (8.8)	180 (10.5)	912 (10.3)
Homemaker	165 (8.9)	152 (8.1)	135 (7.9)	152 (8.9)	118 (6.9)	722 (8.1)
Student (full-time)	67 (3.6)	50 (2.6)	42 (2.5)	53 (3.1)	47 (2.7)	259 (2.8)
Retired (pre-retired or private means)	390 (21.0)	476 (25.4)	571 (33.4)	614 (35.8)	576 (33.6)	2627 (29.6)
Unemployed (unemployment, welfare)	86 (4.6)	82 (4.4)	58 (3.4)	42 (2.4)	52 (3.0)	320 (3.6)
Not reported	*41*	*92*	*190*	*185*	*183*	*691*
Marital status						
Single	351 (18.7)	278 (14.3)	322 (17.3)	280 (15)	298 (15.9)	1529 (16.2)
Married/common law union	1267 (67.6)	1373 (70.8)	1237 (66.2)	1273 (68.1)	1280 (68.2)	6430 (68.2)
Divorced	119 (6.4)	128 (6.6)	139 (7.4)	143 (7.6)	131 (7.0)	660 (7.0)
Separated	37 (2.0)	57 (2.9)	44 (2.3)	42 (2.2)	42 (2.1)	222 (2.3)
Widowed	99 (5.3)	105 (5.4)	128 (6.8)	132 (7.1)	127 (6.8)	591 (6.3)
Not reported	*29*	*25*	*32*	*31*	*23*	*140*
Income category						
<$19,999	111 (7.4)	104 (6.5)	75 (5.1)	70 (4.7)	85 (5.7)	445 (5.8)
$20,000-$39,999	*224 (14.8)*	*215 (13.5)*	*235 (15.9)*	*237 (16.0)*	*213 (14.2)*	*1124 (14.9)*
$40,000-$59,999	281 (18.6)	277 (17.5)	271 (18.3)	296 (20.0)	219 (14.6)	1344 (17.8)
$60,000-$79,999	250 (16.6)	258 (16.3)	224 (15.2)	211 (14.2)	244 (16.3)	1187 (15.7)
$80,000-$99,999	201 (13.3)	226 (14.3)	203 (13.7)	189 (12.7)	206 (13.7)	1025 (13.6)
$100,000+	442 (29.3)	505 (31.9)	471 (31.8)	480 (32.4)	533 (35.5)	2431 (32.2)
Not reported	*393*	*381*	*423*	*418*	*401*	*2016*

Agreement with 'Stay Active' Item Over Time

Table 2 and Figure 1 show the numerical and graphical representations of percentage agreement with the 'stay active' item over the survey waves, and the percentage of respondents reporting exposure to campaign advertisements. For the Leger results, there was an increase in the proportion of respondents who agreed with the statement over time, with a plateau of about 72% (95% Confidence Interval (CI) 69.6-75.7) agreement between 2012 and 2014 (X^2-value of 147.73 (4 degrees of freedom), p=<0.001). Agreement with the 'stay active' item was substantially higher for respondents to the Advanis surveys in 2014 (94.0%, 95% CI 91.6-96.0) and 2015 (93.8%, 95% CI 91.3-95.9) with no difference by year (X^2-value of 0.02 (1 degree of freedom), p=0.89). In 2014, 54.3% (95% CI 50.2-58.4) of survey respondents disagreed with the reversed 'stay active' statement, and this increased to 59.3% (95% CI 55.2-63.6) in 2015, although this increase was not statistically significant (X^2-value of 2.77 (1 degree of freedom), p=0.10).

Reported Exposure to Campaign Messaging

Self-reported exposure to campaign advertisements ranged from 38.8% to 44.8% in the Leger surveys (Table 2). In the Advanis samples, exposure to advertisements with the statement *"Back pain: Don't take it lying down"* was 24.6% in 2014, and 20.2% in 2015. Exposure to advertising saying that you should stay active through back pain was 17.5% in 2014, and 14.2% in 2015. The proportion of respondents reporting having seen one or both of the statements (i.e. combined exposure) was 32.8% in 2014 and 27.1% in 2015.

Table 2. Number of respondents agreeing with the 'Stay Active' statement over the survey waves and reporting exposure to campaign advertisements (Leger)

	2010 n (%*)	**2011 n (%*)**	**2012 n (%*)**	**2013 n (%*)**	**2014 n (%*)**	**Average 2010-2014 n (%*)**
	n=1,902	*n=1,966*	*n=1,902*	*n=1,901*	*n=1901*	*n=9572*
Agreed with statement	1,121 (58.9, 56.6-61.1)	1,228 (62.5, 60.4-64.8)	1,361 (71.6, 69.6-73.4)	1,400 (73.6, 71.7-75.7)	1,361 (71.6, 69.6-73.6)	6,471 (67.6, 66.6-68.6)
Not reported	*0*	*1*	*0*	*0*	*0*	*1*
Reported exposure to campaign advertisements	Not available	Not available	738 (38.8)	851 (44.8)	820 (43.1)	2,409 (42.4)
Not reported	*0*	*0*	*0*	*0*	*0*	*0*

* 95% confidence intervals on the percentage agreement estimates were calculated based on 1000 bootstrap samples.

Figure 1. Agreement with statement 'When you have back pain you should stay active' by year (2010-2015)

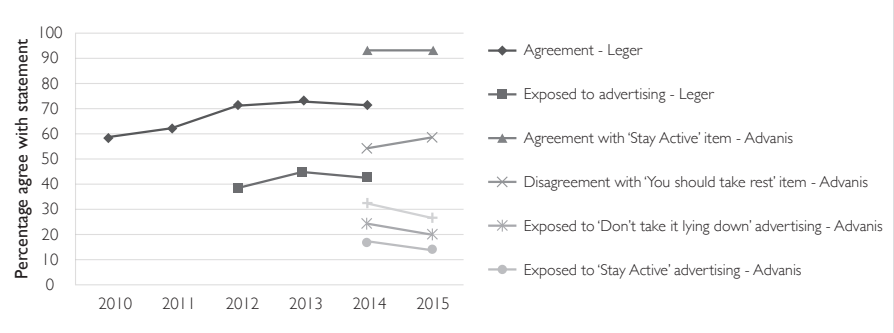

Table 3. Number of Respondents Agreeing with 'Stay Active' Statement and Reporting Exposure to Campaign Messaging

Leger	Seen advertising n (%*)	Not seen advertising n (%*)	Total n
Agree with statement	1,922 (79.8, 78.2-81.4)	2,200 (66.8, 65.2-68.4)	4,122
Disagree with statement	487 (20.2, 18.6-21.8)	1,095 (33.2, 31.6-34.8)	1,582
Total	2,409	3,295	5,704
Pearson X^2 value (significance)			117.6 *(p=<0.001)*
Advanis	**Seen advertising (combined)**	**Not seen advertising (combined)**	**Total**
Agree with statement 'Stay active'	282 (95.6, 92.9-97.6)	645 (93.2, 91.2-94.9)	927
Disagree with statement 'Stay active'	13 (4.4, 2.4-7.1)	47 (6.8, 5.1-8.8)	60
Total	295	692	987
Pearson X2 value (significance)			2.1 *(p=0.19)*

* 95% confidence intervals on the percentage agreement estimates were calculated based on 1000 bootstrap samples.

Results of the logistic regression analysis are shown in Table 4. There were statistically significant univariate relationships observed for survey wave and reported campaign exposure. However, only reported exposure to campaign messaging remained significant in final models (odds ratio, 95% confidence interval = 1.96, 1.73-2.21, p=<0.001). Adding survey type, geographical region, age, sex, educational level, employment situation, occupation, and income category to the model did not result in significant changes to the relationship between campaign exposure and agreement with the 'stay active' item. Campaign exposure was not

modified by survey type. There appeared to be some effect modification by marital status, where the category of divorced people had a lower odds ratio for agreement with the 'stay active' item (interaction term significance p=0.04). However, this was not considered theoretically plausible, and results were therefore not stratified according to marital status groups.

Table 4. Logistic regression models for agreement with statement over the years

Variable		**Crude Model**	**Final model*** (n = 5,704)	
	Odds Ratio (95% CI)	p-value	Odds Ratio (95% CI)	p-value
Exposure to campaign	1.96 (1.74-2.22)	<0.001	1.96 (1.73-2.21)	<0.001
Year				
2010	1.0			
2011	1.61 (1.02-1.32)	0.02		
2012	1.75 (1.53-2.01)	<0.001	1.0	
2013	1.95 (1.70-2.23)	<0.001	1.07 (0.93-1.24)	0.36
2014	1.76 (1.53-2.01)	<0.001	0.97 (0.844-1.12)	0.71

*The final model only included data collected from Leger marketing between 2012-2014, the years in which campaign exposure data were collected by this firm.

DISCUSSION

Seven years after the initial evaluation of a mass media campaign in Alberta, Canada, ongoing campaign activity appears to have had a positive impact on public back pain beliefs specific to campaign messaging about staying active through back pain. At the end of the initial campaign in 2008, 63.4% of respondents agreed with the statement "If you have back pain you should try to stay active", compared with 55.5% prior to the campaign. [15] The current analysis showed that the average percentage agreement with this item continued to increase over the years 2010 through 2014. Agreement plateaued at around 72% (an increase of ~16% from before the campaign), before the evaluation changed to a different company. It is unknown whether substantially higher percentages observed in 2014 and 2015 are due to the campaign or different data collection procedures. There was a statistically significant increase in the proportion of respondents agreeing with the statement over time. A higher proportion of respondents who reported exposure to campaign messaging agreed with the 'stay active' item compared to those who did not report exposure to campaign messaging. This suggests that the campaign has had an ongoing impact on the back beliefs of the general public in Alberta.

Awareness of the campaign over the years was modest, ranging from 34.4% to 44.8%. This is lower than the exposure rate found in first three years of the campaign (i.e. 49% awareness level)[15], and much lower than reported exposure in previous mass media campaigns with similar objectives. For example, an effective Australian mass media campaign reported exposure to be as high as 86%, and a similar campaign in Scotland found 60% awareness of campaign messaging.[9,17] Lower exposure in Alberta is likely to be due to lower campaign dosage, yet ongoing messaging appears to have had the desired effect of steadily improving general public beliefs over time, although a plateau finally appeared to have been reached.

While we cannot conclude with complete certainty that the improvement in respondent beliefs is entirely due to campaign advertising, some evidence suggests that there has been a causal effect. Agreement with staying active during an episode of back pain has increased each year (from a low of 55.5% agreement before the campaign started). Our original evaluation showed that a similar increase was not observed in the control population of Saskatchewan. Additionally, our logistic regression models indicate that the improvements in beliefs over time were significantly associated with reported exposure to campaign messaging. Reported exposure was the only statistically significant variable in the final logistic regression model. Taken together, it appears that the campaign may have resulted in improved public beliefs. However, we are unable to rule out other potential influences on beliefs regarding staying active, such as trends towards more physical activity in the general population that are unrelated to back pain.[18]

Some limitations should be taken into account when interpreting our results. The data from the two polling firms were not entirely comparable, which is illustrated by the 20% higher percentage of people agreeing with the 'stay active' item in the Advanis sample compared to the Leger sample for the year 2014. Although the respondents appeared similar based upon their characteristics available in the dataset, they may have differed on other unmeasured characteristics. Comparison between the two firms was further complicated by the difference in how the primary outcome was measured. Advanis used a reversed 'stay active' item that resulted in dramatically lower agreement rates. This may have arisen due to poor comprehensibility of the *"If you have back pain, you should not stay active, you should take rest"* statement. Additionally, there was no campaign exposure information gathered by Leger in 2010 or 2011.

Strengths of this study include the very large, population-based samples, which appeared representative of the target population through comparison with the most recent census information available from Statistics Canada. This supports the generalizability of our results. However, improved beliefs about remaining active do not necessarily imply that people will take appropriate actions to recover from back pain (i.e. actually staying active), and that unnecessary health care utility due to back pain will decrease. As a cross-sectional survey of attitudes and beliefs about back pain from New Zealand suggested, there may be uncertainty regarding what constitutes staying active.[7] Improved back beliefs do not necessarily lead to improved health behavior and many barriers may exist between beliefs and behavior, as many social cognition and health behavior models have suggested.[19] Further research is needed to determine if the improved beliefs observed in our study also resulted in improved health utilization and work disability behaviors. Further research should also evaluate populations with specific risk factors associated with back pain, such as workers or adolescents [20], who may be amenable to mass media or social marketing interventions.

CONCLUSION

An ongoing back pain mass media campaign in Canada resulted in an increase in the proportion of survey respondents agreeing that they should stay active when experiencing back pain. These improvements were linked to exposure to campaign messaging indicating the campaign had continued impact on public beliefs.

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