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Fostering change in back pain beliefs and behaviors: when public education is not enough

Douglas P. Gross, PhD[a,*], Sameer Deshpande, PhD[b], Erik L. Werner, PhD[c], Michiel F. Reneman, PhD[d], Maxi A. Miciak, BScPT[e], Rachelle Buchbinder, PhD[f,g]

[a]*Department of Physical Therapy, University of Alberta, 2-50 Corbett Hall, 8205 114 St. Edmonton, Alberta T6G 2G4, Canada*
[b]*Faculty of Management, University of Lethbridge, 4401 University Drive, Lethbridge, Alberta T1K 3M4, Canada*
[c]*Research Unit for General Practice, Uni Health, Kalfarveien 31, 5018 Bergen, Norway*
[d]*Department of Rehabilitation Medicine, Center for Rehabilitation & Rehabilitation Medicine, University Medical Center Groningen, University of Groningen, P.O. Box 30002, 9750 RA Hare, The Netherlands*
[e]*Faculty of Rehabilitation Medicine, University of Alberta, 3-48 Corbett Hall, 8205 114 St. Edmonton, Alberta T6G 2G4, Canada*
[f]*Monash Department of Clinical Epidemiology, Cabrini Hospital, Suite 41, Cabrini Medical Centre, 183 Wattletree Rd, Malvern, VIC, Australia*
[g]*Department of Epidemiology and Preventive Medicine, School of Public Health and Preventive Medicine, Monash University, Australia*

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Abstract Mass media campaigns designed to alter societal views and individual behaviors about back pain have been undertaken and evaluated in multiple countries. In contrast to the original Australian campaign, subsequent campaigns have been less successful, with improvements observed in beliefs without the corresponding changes in related behaviors. This article summarizes the results of a literature review, expert panel, and workshop held at the Melbourne International Forum XI: Primary Care Research on Low Back Pain in March 2011 on the role and interplay of various social behavior change strategies, including public education, law and legislation, healthy public policy, and social marketing in achieving a sustained reduction in the societal burden of back pain. Given the complexities inherent to health-related behaviors change, the Rothschild framework is applied in which behavior change strategies are viewed on a continuum from public education at one end through law and health policy at the other. Educational endeavors should likely be augmented with social marketing endeavors and supportive laws and health policy to foster sustained change in outcomes such as work disability and health utilization. Practical suggestions are provided for future interventions aimed at changing back pain-related behaviors. Evaluation of previous back pain mass media campaigns reveals that education alone is unlikely to foster positive and persisting behavioral change without concomitant strategies.

Keywords: Mass media; Social marketing; Back pain; Behavior change, public policy; Public education

The clinical problem

Mass media campaigns designed to alter beliefs about back pain have been undertaken and evaluated in Australia, Scotland, Norway, and Canada [1–4]. These campaigns have addressed widely held misconceptions about back pain that view it as a serious disabling condition requiring rest. Key messaging in the campaigns has included advice to stay active, and at least three of the campaigns had the similar

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* Corresponding author. 2-50 Corbett Hall, University of Alberta, 116 St. and 85 Ave., Edmonton, Alberta T6G 2G4, Canada. Tel.: (1) 780-492-2690; fax: (1) 780-492-4429.

E-mail address: dgross@ualberta.ca (D.P. Gross)

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theme of ''Back Pain: Don't Take It Lying Down.'' These campaigns were previously compared and contrasted from a content as well as methodological perspective to identify how best to design and evaluate such interventions [5].

Important differences exist across mass media campaigns in terms of their scope, amount of funding, and media used. The most successful in demonstrating a sustained change in beliefs about back pain as well as behaviors, such as health care utilization and disability, appears to have been the campaign conducted in the state of Victoria, Australia [6,7]. This campaign was very well funded (~US$8 million over 3 years), predominantly used television commercials, featured recognizable spokespeople, comedians and a wide variety of clinical experts, and contained practical information about how to stay active and stay at work (ie, exercise, modified work demands, and so forth). Also, the messages were endorsed by all relevant clinical organizations with a stake in treating back pain and this was prominently noted in the television commercials. The campaign had the approval of employer and employee organizations ensuring that stakeholders were ''on side'' [8], and in conjunction with the campaign, Victorian doctors were mailed evidence-based guidelines for the management of compensable back pain. Evaluation of the Australian campaign involved surveying beliefs of the general population of Victoria and an adjacent demographically similar state that did not receive the campaign. Surveys were completed at four times; before, during, immediately after, and 3 years after the intervention. Surveys of general practitioners in Victoria and the adjacent control state were also performed before, immediately after, and 4.5 years after the Victorian campaign. Behavioral outcomes were evaluated through an analysis of the Victorian WorkCover Authority claims database (proportion of time loss claims for back pain and health utilization for back pain). The evaluation indicated that the population exposed to the intervention showed sustained improvements in back pain beliefs (ie, were less likely to think back pain needed to be rested) and dramatic reductions in work-related disability (15% reduction in compensation claims) and health care visits (20% reduction in medical costs per claim) for the condition [1,6,7].

Subsequent campaigns in Scotland, Norway, and Canada also seem to have resulted in population belief changes but did not measurably impact health use or disability behaviors, such as work loss. An explanation for this is likely to be multifactorial. For example, these campaigns were undertaken on a much more limited budget, relied on other media besides television (eg, radio advertisements, billboards, and online messaging) and did not have the capacity to present the breadth of specific advice about how to stay active (ie, the Australian campaign featured messages on why and how to stay active from a variety of recognized international and national medical experts from a wide variety of disciplines, as well as sporting celebrities and local television personalities, some of whom had successfully managed their own back pain). The cost of the Australian campaign was approximately US$1.8 per resident, whereas the cost of the other campaigns ranged from approximately US$0.2 per resident in Scotland and Norway to US$0.3 per resident in Norway and Canada (amounts are not adjusted for inflation) [5]. Some did not provide explicit advice about staying at work. These important differences may partially explain why subsequent campaigns have not proven as successful as the original Australian campaign. However, factors unrelated to the campaigns, such as legislation and health policy, also likely played an important role.

New evidence

This article summarizes results of a literature review, expert panel, and workshop held at the Melbourne International Forum XI: Primary Care Research on Low Back Pain in March 2011 on the role and interplay of various social behavior change strategies including public education, law and legislation, healthy public policy, and social marketing in achieving a sustained reduction in the societal burden of back pain.

Initially, a group of researchers and practitioners from multiple fields and disciplines involved in changing health-related behavior were brought together to discuss the issue of changing societal back pain behaviors. This group included researchers who had previously evaluated the various international back pain mass media campaigns. The group also included academics with content expertise and experience in conducting research in the areas of social marketing, law and legislation, and healthy public policy. Next, this group reviewed and discussed general theories and techniques of health-related social behavior change from the perspective of the different disciplines represented. An article was drafted summarizing results of the previous back pain mass media campaigns and the broader literature related to social behavior change.

The draft article was then presented as a basis for discussion at a workshop held at the Melbourne International Forum XI: Primary Care Research on Low Back Pain (March 2011). One key theme of the Melbourne Forum was informing the public and examining the role of social marketing, advertising authorities, public health, and journalists. Plenary talks and a roundtable discussion were held at the Forum focused on this issue. Additionally, our multidisciplinary group hosted a workshop at the conference focused on key strategies for achieving health behavior change. Attendees at the workshop were identified in advance. They were given the draft article to review and asked to come to the workshop ready to discuss the main issues identified and provide feedback on the article. Discussion at the conference and comments from the workshop participants were synthesized and incorporated into the manuscript. A summary of the workshop and the revised article were then sent back to the workshop participants

for comments. They were asked whether the summary and revisions accurately captured the discussion and were specifically asked to contact us if they identified inaccuracies. After this verification step, the article was finalized.

Areas of uncertainty/critique of established approaches

Strategies for achieving social change

When considering health at the population level, the distinction between health beliefs and associated behaviors is critical and complex [9]. Although people may believe a certain activity or product is healthy, whether they actually modify their behavior to undertake the activity or use the product is a separate issue and is dependent on many factors other than health beliefs, such as ability, addiction, habit, and choice, among others [9]. The transition from a healthy belief to a corresponding change of behavior depends not only partially on a perception that the positive health outcomes outweigh the burdens of changing behavior but also on a supportive social, environmental, and political context [9,10]. One well-known example is smoking cessation. A sizeable proportion of people believe that smoking is bad for health, yet they continue to smoke [11]. For this reason, most public health interventions aimed at helping people to stop smoking do not rely solely on providing education regarding the health detriments of smoking but combined the messaging with other tobacco control strategies such as legislation changes involving laws against smoking in public areas or increased taxation on tobacco products [12,13].

Given the complexities inherent to health-related behavior change, Rothschild [14] has proposed a framework for the management of public health and related social behavior. In this framework, behavior change strategies are viewed on a continuum from public education at one end through law and health policy at the other (see Table 1). Social marketing resides somewhere between education and law on the continuum, incorporating both education as well as contextual modifications to facilitate change. Each of these strategies will be discussed in the context of nonspecific back pain, although many of the messages also apply to individuals with specific back pain (ie, stay as active as possible).

Public education

One of the most basic assumptions about human behavior is that what people believe guides what they do [15]. This assumption implies that detrimental health behavior is caused by a lack of awareness or knowledge on the part of the individual. If an individual holds the belief that back pain is because of serious structural pathology that requires rest to heal, they will be more likely to rest when experiencing an episode of pain [16,17]. Changing this belief should change the resulting behavior, and this has been the focus of previous back pain mass media campaigns [3,5]. Other examples of public education strategies in addition to mass media campaigns include classes or ''schools'' where multiple people with the health condition receive education about their condition, distribution of booklets or educational pamphlets to patients, or direct education by health care providers. Each of these has been tested in populations of patients with back pain, and the results are modestly positive [18–21].

Social determinants of health have been found to influence knowledge and beliefs about back pain. Male gender, lower household income, lower educational attainment, suboptimal health literacy, and blue-collar occupation have all been associated with back pain beliefs that are not in accordance with the best available scientific evidence [4,22–24]. As has been seen from the evaluations of back pain mass media campaigns, education is typically effective to change beliefs irrespective of social determinants but may have less ability to alter behavior for a variety of reasons, including other factors besides beliefs influencing health behaviors [25,26]. Attitudes about the health condition play an important role, as does the broader context in which the individual resides. For example, if a worker experiencing back pain believes staying active is important but is unable to continue work at a heavy level, that worker is unlikely to stay active

Table 1
Rothschild model of social behavior change

Public education	Social marketing	Law/policy interventions
		
Libertarian approach	*Intermediate approach* (Incorporates components of education and contextual changes)	*Authoritarian approach*
Provision of information	Use of commercial marketing techniques to change health behaviors	Legislation changes to limit or facilitate access to a behavior
Assumes the public will act on health information provided to appropriately change behavior	Assumes behavior is explained by a lack of opportunity and strives to provide both motivation and opportunity	Assumes the public is unwilling to change health behavior and requires forced compliance

within the context of work if modified work duties are not provided by the employer or if financial compensation is only available if they take time off work. There are also situations when the person's environment plays a critical role in influencing whether the person remains active or not, such as the presence of a solicitous spouse or family member who takes over required home and personal care activities. The message-only approach is unlikely to work in these situations. Additionally, people are often exposed to conflicting educational messages in the media [27]. For example, people may be less likely to self-manage back pain through activity when they hear media advertisements from health professionals offering ''curative'' treatments as the quickest way to recover [28].

Clearly, education has a role in changing behavior; however, its effects may vary depending on the context in which it is given. Recent research is showing that initial experiences with back pain occur early in the lifespan, at times within the teenage years [29,30]. Perhaps educational initiatives need to target individuals earlier in the lifespan, during key formative years when maladaptive beliefs and attitudes about the condition are being shaped. Such a change in audience would require dramatic changes in the messaging and media used in future public educational campaigns. Strategies such as comics, children's books, or using cartoon celebrity spokespeople could be useful techniques for disseminating advice. From a research and evaluation point of view, the outcome of such a strategy would take many years to be measurable. Although this has not been evaluated for back pain, some promising pilot research has been conducted on the use of comic books for smoking cessation and prevention of sexually transmitted disease [31,32].

In the case of previous back pain mass media campaigns, it is important to consider the key differences between campaigns in terms of scope, timing, and key messaging. It may be the case that a larger campaign with more expansive messaging, as was done in Australia, is needed to obtain behavior change. Not only was higher penetration of the campaign observed (86% awareness in Australia vs. 60% in Scotland, 39% in Norway, and 49% in Canada) but also back pain beliefs improved across the population to the same extent irrespective of demographic, clinical, socioeconomic, and occupational factors. However, it is important to recognize that there were other favorable features of the Australian campaign that augmented the overall educational messages and may have contributed to behavior change. These will be discussed within the context of law or public policy, the opposite end of the Rothschild framework.

Law and public policy

As noted above, smoking cessation educational activities have been augmented with legal or public policy interventions such as increased taxation on tobacco products [33] and bylaws against smoking in public places, such as restaurants, bars, or airplanes [13]. Restricting access to the activity combined with ongoing messaging related to adverse health effects has been proven to be successful for reducing smoking rates at the population level.

Such strategies assume that behavior is explained not only by knowledge or beliefs but also by a lack of motivation. Incorporating societal rules to prohibit undesirable behaviors may create the necessary incentive for people to act on what they already know to be healthy. In this section, law and healthy public policy will be considered together although it is recognized that healthy public policy can often be developed and implemented without formal legislation.

In the case of back pain and other painful musculoskeletal conditions, public policy has been observed to dramatically influence behaviors such as work disability and health care utilization [34,35]. Public policy includes economic factors such as willingness to pay for health care for back pain as well as availability and level of financial compensation or payments. For example, availability of workers' compensation payments or ability to sue for pain and suffering have both been found associated with delayed recovery [35–37]. Because of this, legal or health policy interventions have the potential to play a major role in improving back pain-related health behaviors. Such interventions could include restrictions on the amount of advertising allowed by providers or companies offering unproven curative interventions or system changes to alter access to health services, wage replacement benefits, or reimbursements for unproven treatments. For example, during the Canadian campaign, the workers' compensation board mandated that injured workers visit a physician or health provider every 2 weeks for follow-up. If claimants with back pain did not visit their physician at 2-week intervals, they were at risk of having their case closed as noncompliant with care. It is unlikely that an educational campaign focused on self-management via activity would impact the number of visits to physicians when such a policy is in place. Other examples of how changes in laws or health policies have led to altered disability or health utilization behaviors for people with musculoskeletal conditions have been discussed elsewhere [38–40].

During the Australian campaign, some information was presented about policies or laws that supported the campaign's key messaging. In addition to educational messages explicitly encouraging people with back pain to remain at or return to work, several advertisements featured an employer discussing the possibility of being fined if the company did not help a worker with back pain return to work (see Table 2) [41]. Other advertisements provided advice to employers about the importance of having modified work policies to enable workers to return to work early and despite back pain, along with the potential reductions in claim costs this provides (Table 2). It is important to note that these policies and financial incentives were already in place in the jurisdiction, and campaign messaging only highlighted them. However, highlighting the supportive

policies may have been a major reason for the changes observed in the associated behaviors. Not only did subsequent campaigns fail to explicitly provide advice regarding work but also failed to feature messaging of this type. Also, the Australian mass media campaign had the support and participation of all major stakeholders, including not only the various health care professionals with a stake in treating back pain but also employer groups and workers' unions. Stakeholder endorsement and participation has been deemed critical for successful back pain interventions [8].

Of note, the only subgroup that the Australian mass media campaign failed to influence were general practitioners with a special interest in back pain [42]. Before the campaign, these doctors also had significantly poorer beliefs (nonevidence based) about low back pain compared with their colleagues without a special interest in low back pain. This suggests that special interests may be an important barrier to behavior change toward evidence-based care and additional policy initiatives directed at health care providers may also be necessary.

In locations where supportive law or policy already exists, future mass media campaigns are likely to be more successful if they build on this and highlight the policy and laws as part of the messaging strategy. Where supportive laws and health policy are not in place, this could be an effective avenue for fostering behavioral change. Alternatively, detrimental laws or health policies related to compensation for back pain could be changed. However, policy makers meet conflicting interests. In most industrialized countries, compensation for work loss due to illness or injury is a gained right for workers, with back pain considered a compensable condition. If back pain were to be withdrawn from this right, it would implicate a view of back pain as a natural condition. This may be true but still difficult to implement as it would likely be considered as a loss of a gained right among workers. However, as early as 1995, an International Association for the Study of Pain task force proposed the radical alteration of limiting wage replacement funding for back pain to 6 weeks, unless credible diagnostic evidence (ie, diagnosis other than nonspecific back pain) indicated permanent or long-term disability [43]. Implementing such a restrictive policy in societies in which being off work is perceived as a right might not be perceived as a public gain and could have clear implications for leaders proposing the legislation. Additionally, individuals holding such views are unlikely to agree wholeheartedly with messages regarding the importance of staying active and staying at work. Such restrictions of eligibility for sick listing and wage replacement benefits have recently been put in place in Sweden with mixed response [44], but this initiative has not yet been formally evaluated. Although law and health policy changes may be needed in some jurisdictions more than others [34], deciding what policies should be put in place to benefit the health of the population is controversial and currently a matter of debate with several conflicting interests.

In Australia, it has been suggested that back pain become one of the several national health priority areas [45]. The national health priority areas initiative seeks to focus public attention and health policy not only on areas of health that impose a significant national burden but also where improved health outcomes are attainable to reduce that burden [46]. This could provide a more cohesive focus for policy, legislation and public awareness of back pain, and opportunities for appropriate public health and workplace initiatives. This type of policy window of opportunity is critical to placing issues such as back pain prevention and management on the agenda [47,48].

Social marketing

Although education attempts to change the individual whereas law and policy attempts to change the broader social context, social marketing typically strives to do both. Social marketing has been defined as "the use of marketing

Table 2
Scripts of two Australian television advertisements

Policy-focused (upstream) advertisement
Employer: "Do you know that I can be fined $25,000 if I don't take Joe back to work? How the hell am I supposed to get him back? He's done his back in."
Secretary: "Are you asking me?"
Employer: "Ah … yes, go on."
Secretary: "You could change the job a bit. Get some bench-height trolleys. That way Joe wouldn't have to lift the parts on and off after he's machined them."
Employer: "He wouldn't have to twist or bend."
Secretary: "You'd get Joe back and you'd save yourself $25,000 in fines."
Employer: "Why didn't I think of that?"
Secretary: "Because you're the boss … and I'm just a secretary."
Behavior-focused (downstream) advertisement
Employer: "You know, I want Joe back but it is just too hard."
Secretary: "Joe's been with us a long time. You owe it to him."
Employer: "Oh I know, I know. He did his back in here. But what can I get him to do?"
Secretary: "Is this a serious inquiry?"
Employer: "Yes, it is."
Secretary: "Well maybe think about changing the way Joe does his job. Talk to the occupational rehab person. They deal with this thing all the time."
Employer: "Good idea. I should have thought of that earlier."
Secretary: "Yes, you should have. Maybe Joe wouldn't have hurt his back in the first place."

principles and techniques to influence a target audience to voluntarily accept, reject, or abandon a behavior for the benefit of individuals, groups, or society as a whole.'' [49] It is based on the assumption that behavior is explained by a lack of opportunity as opposed to a lack of motivation [14]. In addition to providing education about the health condition, social marketers attempt to change the social context to provide a legitimate and attractive alternative to the status quo. For example, social marketing aimed at reducing drunk driving have combined education about the risks of the behavior along with advice about and provision of feasible alternatives to the activity (ie, inexpensive rides home from pubs or bars) [50]. As such, social marketing goes beyond education about health conditions and includes attempts to ''nudge'' and ''hug'' individuals toward positive health behaviors without imposing penalties or serious consequences [51,52]. In this manner, individual autonomy and responsibility for health is maintained.

Social marketing may consist of efforts to influence the behaviors of individuals within a society (ie, downstream marketing) or the behavior of governments or health policy makers (ie, upstream marketing). Marketing efforts aimed at governments or policy makers attempt to influence the creation of laws and supportive policy when these are not already in place. The choice of the target audience (upstream or downstream) governs what messages and marketing approaches are used. Detailed benchmarking criteria have been outlined to assist in planning social marketing interventions (see Table 3) [53,54]. This includes detailed planning, segmentation analysis of the target audience, consideration of the four *P's* of traditional marketing (Promotion, Product, Price, and Place), strategic planning for how to engage all relevant stakeholders, as well as formal evaluation.

In terms of promotion, social marketing considers a variety of techniques to spread information including advertising, public relations, sales promotion, and direct marketing (see Table 4). Although many of these are done separately, recent recommendations include striving to integrate these techniques because of the high volume of marketing messages and ''noise'' the public is exposed to daily [55]. Because of the exposure to thousands of messages, marketers have to create messages that cut through the clutter. Ensuring consistency in messaging is one way to do this and improve message recognition. As a result, integrating various communication elements becomes critical and could occur on several fronts. First, the promotion strategy should be consistent with the marketing strategy (ie, with the behavior being promoted, brand positioning, and so forth). Second, the audience should be exposed to consistent messaging across the advertising campaign, publicity from journalists, incentivizing attempts of sales promotion, and so on. These strategies result in less confusion of the audience members and higher intervention effectiveness. Such integrated messaging should be considered for the case of back pain to outline the most appropriate means of disseminating information to the target audience.

Given the huge expense associated with traditional means of advertising in the mass media, it may be that future campaigns spread messaging predominantly via less expensive

Table 3
Social marketing benchmark criteria

Customer orientation (know the audience): The intervention uses formative research based on primary or secondary data sources to identify audience characteristics and needs, or the intervention elements are pretested with a sample of the target audience.

Behavior: The intervention seeks to influence the behavior of individuals or groups and has specific measurable goals.

Theory-based design: The development of the intervention and/or understanding of the audience explicitly relies on behavioral or social theories or models.

Insight: What moves and motivates

Exchange of value: The intervention motivates people to adopt or sustain behavior by offering benefits (tangible or intangible) and/or reducing costs (barriers) related to the behavior. The exchange concept is actualized through the design and implementation of the marketing mix.

Competition: Considers competing behaviors or messages that may influence the target audience to not perform the desired behavior. What competes for the time and attention of the audience?

Segmentation and targeting: The intervention's audience is divided into subgroups called ''segments'' that share something in common (eg, job type, demographic characteristics, desires, or readiness to change) that make them more likely to respond similarly to the intervention. The intervention strategy targets or is customized for the selected segment(s). Propose segmenting the market if it is appropriate for the health context/behavior.

Methods mix: Four primary domains:

1. Informing/encouraging
2. Servicing/supporting
3. Designing/adjusting the environment
4. Controlling/regulating

The intervention attempts to use all four ''Ps'' of traditional marketing:

Promotion: Communication with the audience to make a product or service familiar, acceptable, and desirable.

Product: A product (or service) is a bundle of benefits that satisfies a need for the audience. The product augments the desired health behavior.

Price: Identification and reduction of the monetary and nonmonetary costs of performing a behavior.

Place: Reduction of the location cost of a product or service as well as carrying out the behavior achieved through enhancing convenience and accessibility.

Strategic planning

Partnership and stakeholder engagement: The intervention builds, enhances, and retains good relationships with the target audience; for example, by ensuring service quality or audience satisfaction or by audience participation in the design of the intervention.

Review and evaluation: Research aimed at evaluating the effectiveness of the intervention.

Table 4
Integrated social marketing communication

1) Advertising: Paid, sponsor-identified, nonpersonal media communications
2) Marketing public relations: Publicity, events, advocacy (structural changes, pass laws), fundraising, and sponsorship
3) Sales promotion: Special incentive to encourage immediate "sale," uptake or use (ie, samples, coupons, gifts, contests)
4) Direct marketing: Direct contact with target via personal "selling," direct mail, direct response ads

Based on the study by Glanz et al. [9].

methods, such as the internet or web-based communication. For example, if well-known celebrities or sporting figures are enrolled as spokespeople then social networking sites such as Facebook or Twitter could be used to widely and inexpensively disseminate advice to followers. How best to incorporate "direct to consumer" marketing should also be considered. Traditionally, health care providers have provided one-on-one education for individuals with back pain. This has proven to be successful in smoking cessation but depends highly on the knowledge, beliefs, and interests of the health care providers [56,57]. In the case of back pain, because knowledge, beliefs, and interests vary across providers, this may not be the ideal venue for providing advice to stay active [58,59]. Back pain sufferers typically seek care when pain is severe, and recent qualitative research has indicated that advice to stay active is not well received during acute bouts of severe pain [60]. Education could take the form of mailed pamphlets or email messages from public health agencies, employers, or insurance companies. Messaging provided at the location of the desired behavior (ie, workplaces) may also be more effective than via the mass media, or as a supplement to this, as was done in the Norwegian campaign [3]. For example, employers could be targeted to provide rewards or incentives to workers who demonstrate desirable behaviors such as participation in worksite exercise sessions or modified work programs. Messaging by "low back pain–peers" who are able to remain working although experiencing low back pain may be considered [61]. Peers could highlight strategies for and the benefits of staying at work. Financial incentives are currently offered to companies via reduced compensation or insurance premiums because of the participation in modified work programs; however, these incentives are rarely passed on to front-line workers participating in the programs. Sales promotion (ie, providing monetary/nonmonetary incentives) is another strategy that has not been used in back pain messaging, yet is worthy of exploration. Given the emphasis on behavior change in social marketing, sales promotion strategies are warranted.

In the case of back pain, the issue of sustainability of behavior change is important because it is a recurring phenomenon. Ideally, individuals would have their beliefs changed regarding the importance of activity via education, and this would be combined with long-term changes in their context to allow the integration of the desired behaviors. Provision of education alone may be less likely to lead to long-term, sustained changes without modifications to the social context. For this reason, when compared with education and law and policy changes, social marketing may be more effective for changing back pain-related behavior. Indeed, the Australian campaign appears to have moved beyond education to include components of social marketing both in how it was conceived and what the messages were. Besides just talking about back pain and how to manage it through exercise and activity, the campaign provided explicit advice about implementing changes and modified work programs at worksites (see Table 2). The combination of education and advice about the condition, combined with attempts to foster more supportive work contexts move this campaign more into the realm of social marketing.

Lastly, considering the expense of public education or social marketing interventions and the frequent exposure to advertising messaging in modern society, it may be worthwhile merging back pain campaigns with other public health campaigns addressing different conditions but similar target behaviors. Staying or becoming active and participating in exercise is not only beneficial for back pain but also a key message of other health condition campaigns, such as obesity, diabetes, heart disease, and arthritis, among others. All these campaigns include advice to stay active as a key message, and perhaps, there is opportunity to build on each other. For example, the successful "10,000 steps" campaigns focusing on increasing physical activity via pedometer use share many similar goals as the "Stay Active" back pain campaigns [62,63]. Perhaps synergies and efficiencies could be obtained if campaign organizers worked together to target this common behavioral goal.

When to choose education versus law, policy, or social marketing?

Evidence in the field of back pain research supports that education, law, policy, and social marketing may each be effective for changing behaviors, but what should be the prime focus of future public health initiatives? This will depend largely on the nature of the target audience as well as the social context in which they reside. Rothschild has proposed a categorization system whereby audiences can be analyzed for the purpose of selecting the most appropriate strategy (see Figure) [14]. This system indicates that the most effective strategy for obtaining behavior change depends on the characteristics of the target audience, including motivation and readiness to change, opportunity to change, and ability to change. If a population is deemed motivated to change, has appropriate opportunity to change, and is prone to behave, education alone is likely to be effective. If they are motivated but do not have the opportunity or ability to change, social marketing may be effective. If an audience is not motivated to change yet has the opportunity and ability, legal or policy interventions are required. Other combinations of the factors will require a combination of education, social marketing, and law (see Figure).

Does the audience have sufficient MOTIVATION to change behavior?	YES		NO	
Does the audience have sufficient OPPORTUNITY to change behavior?	YES	NO	YES	NO
Does the audience have sufficient ABILITY to change behavior? YES	Prone to behave *education*	Unable to behave *marketing*	Resistant to behave *law*	Resistant to behave *marketing, law*
NO	Unable to behave *education, marketing*	Unable to behave *education, marketing*	Resistant to behave *education, marketing law*	Resistant to behave *education, marketing law*

Figure. Applications of education, marketing, and law. Reprinted with permission from Journal of Marketing, published by the American Marketing Association, Rothschild ML, 1999, vol. 69, pp. 24–37 [14].

This categorization system is conceptual but some validity evidence has been presented from the studies of work-injury prevention initiatives [64]. Developers of future back pain public health initiatives should carefully consider the nature of their audience and the context before deciding what behavioral intervention strategies to use. However, recognizing that most populations are not entirely homogeneous in the areas of motivation, opportunity, and ability to change, it is likely that a combination of the three will be required for most impact. As mentioned, this appears to have been the strategy taken by the organizers of the Australian campaign. Given that all subsequent campaigns have been substantially different, replicating the initial Australian campaign as closely as possible with careful and rigorous evaluation of effectiveness is required.

Another important issue that must be considered by developers of future campaigns is how the effectiveness of a specific change strategy can be optimized, given the various factors that could potentially influence results. This includes broad societal factors such as characteristics of the prevailing culture, ethnicities, and religious beliefs, among other factors. As discussed previously, the change strategy chosen, whether it be education, social marketing, or law and healthy public policy will need to be tailored to the meet the specific needs of the target population.

Conclusions and recommendations

Evaluations of previous back pain mass media campaigns highlight that education alone is unlikely to be sufficient to foster positive and persisting societal behavioral change. Four mass media campaigns have been undertaken and evaluated in separate countries (Australia, Scotland, Norway, and Canada) and only the Australian campaign resulted in changes to both work disability and beliefs. The Australian campaign was not only larger in magnitude but also accompanied by supportive laws and policies in the jurisdiction. The other three campaigns were much smaller in scope, had more limited messaging, and were not always as supported by institutional policies and legislation. Educational endeavors should likely be augmented with supportive laws, healthy public policy, and social marketing endeavors to foster sustained change in outcomes such as work disability and health utilization.

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