

Social marketing interventions aiming to increase physical activity among adults: A systematic review

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Social marketing interventions aiming to increase physical activity among adults: a systematic review

Abstract

Purpose: A significant proportion of the world's adult population is insufficiently active. One approach used to overcome barriers and facilitate participation in physical activity is social marketing. The aims of this systematic review are twofold: first, this review seeks to provide a contemporary review of social marketing's effectiveness in changing physical activity for the better; second, it seeks to ascertain the extent that Andreasen's (2002) six social marketing benchmark criteria have been applied in social marketing interventions targeting physical activity.

Design/methodology/approach: Ninety-four articles covering twenty-six social marketing interventions were identified following systematic literature review procedures.

Findings: None of the interventions gave evidence that they addressed all six social marketing benchmark criteria, and only four interventions addressed five criteria. Our results indicate that three of the benchmark criteria, namely behavioural objectives, formative research and marketing mix are well utilised in social marketing interventions. Inclusion of market segmentation, exchange and competition offers potential to extend further on social marketing's effectiveness in increasing physical activity.

Originality/value: The results of the current study indicate that increasing the number of benchmark criteria used in an intervention to at least four increases the chances of achieving positive behavioural outcomes.

Keywords: Social marketing, physical activity, interventions

Paper type: Review

Introduction

Over 80% of the adult population are insufficiently active. The World Health Organization estimates 3.2 million deaths are caused by physical inactivity (World Health Organization, 2015). Efforts to increase participation in physical activity in adults are often impacted by barriers such as lack of motivation, time, social capital, poor health and lack of facilities (Cerin *et al.*, 2010; Trost *et al.*, 2002; Zlot *et al.*; 2006). One approach used to overcome barriers and facilitate participation in physical activity is social marketing (Berkowitz *et al.*, 2008). Social marketing relies on commercial marketing techniques to deliver interventions for social benefit.

In October 2013, a consensus definition of social marketing was reached stating “social marketing seeks to develop and integrate marketing concepts with other approaches to influence behaviours that benefit individuals and communities for the greater social good” (International Social Marketing Association, European Social Marketing Association, and Australian Association of Social Marketing, 2013). By understanding the extent that Andreasen’s (2002) six social marketing benchmark criteria are employed this paper distinguishes social marketing, which employs a competitively minded approach offering alternatives that customers value and would willingly exchange for, from other behaviour change approaches, which include education, training, enforcement, infrastructure, technology, urban planning, community development, and health promotion (Rothschild, 1999; Tapp and Rundle-Thiele, 2016).

Systematic literature reviews provide important evidence supporting the effectiveness of social marketing and public health interventions (Chilton *et al.*, 2015; Dietrich *et al.*, 2016). To date there have been only a handful of studies attempting to integrate the existing knowledge to identify factors leading to the success or failure of social marketing

interventions aiming to increase physical activity, and their results are nearly a decade old (Gordon *et al.*, 2006; Stead *et al.*, 2007). Social marketing as an academic discipline has experienced a significant period of growth since 2008, evidenced by a large number of publications (Truong, 2014). While systematic reviews of evidence are available on healthy eating (Carins and Rundle-Thiele, 2014) and problem alcohol use (Kubacki *et al.*, 2015) a contemporary review is not available in the area of physical activity. Given the rapid increase in the number of studies reporting evaluations of social marketing interventions (Truong, 2014) a systematic literature review, which can present a vast amount of information about different studies in a succinct manner (Hartling *et al.* 2014), is warranted. A systematic literature review of social marketing interventions assists in the identification of the extent that benchmark criteria have been applied to date in physical activity interventions.

Several attempts to set benchmark criteria in social marketing have been made, including by Lefebvre and Flora (1988), French and Blair-Stevens (2006) and Robinson-Maynard *et al.* (2013). Some benchmark criteria do not offer mutually exclusive criteria for categorisation purposes, for example, consumer orientation and insight are not easily distinguishable in French and Blair-Stevens's (2006) benchmark criteria. Andreasen's (2002) benchmarks offer six mutually exclusive criteria. These six social marketing benchmark criteria include behavioural change, formative research, segmentation, marketing mix, exchange and competition. These six criteria were later endorsed in other social marketing benchmark criteria (French and Blair-Stevens, 2006; Robinson-Maynard *et al.*, 2013). Based on evidence demonstrating that behaviour change is more likely when more of the six social marketing benchmark criteria are employed (Carins and Rundle-Thiele, 2014) this review attempts to understand the extent to which the six social marketing benchmark criteria were reported in

social marketing interventions aiming to increase physical activity among adults aged 18-60 years old.

Given the success of behaviour change efforts in physical activity (Gordon *et al.*, 2006; Stead *et al.*, 2007) extending our understanding of the extent of social marketing benchmark criteria use in physical activity represents an important undertaking. The aims of this systematic review are twofold. First, this review seeks to provide a contemporary review of social marketing's effectiveness in changing physical activity for the better. The current study builds on earlier review work providing an update on social marketing intervention effectiveness extending our understanding beyond 2007. Second, this review seeks to ascertain the extent that Andreasen's (2002) six social marketing criteria have been applied in social marketing interventions targeting physical activity to distinguish social marketing from other behaviour change approaches and understand how further improvements in social marketing application can be made in future. Our aim is not to stigmatise other behaviour change approaches, all of which are known to be effective.

Methods

Search strategy

Following procedures outlined in Carins and Rundle-Thiele (2014) a search was conducted to identify all social marketing interventions that aimed to increase physical activity among adults aged 18-60 years old, and published in peer reviewed journals before January 2015¹. A focus on studies self-identifying as social marketing was imposed to ensure that other behaviour change approaches (e.g. education, public health etc.) were not included, permitting a clear distinction of specific marketing criteria to be established. Nine databases,

¹ A start date was not specified in this review.

including marketing, business and communication databases, were searched using the following terms (Table 1): physical+activit* or exercis* AND intervention* or Randomi#ed Controlled Trial or evaluation or trial or campaign* or program* or study or studies AND social marketing.

Table 1: Databases and articles retrieved in initial search

| Database | Number of articles retrieved |
|-----------------------------------|-------------------------------------|
| EBSCO All Databases | 99 |
| Medline (R; and InProcess) (Ovid) | 210 |
| ProQuest All Databases | 412 |
| PsycINFO (Ovid) | 80 |
| ScienceDirect | 47 |
| Web of Science | 366 |
| Total | 1,214 |

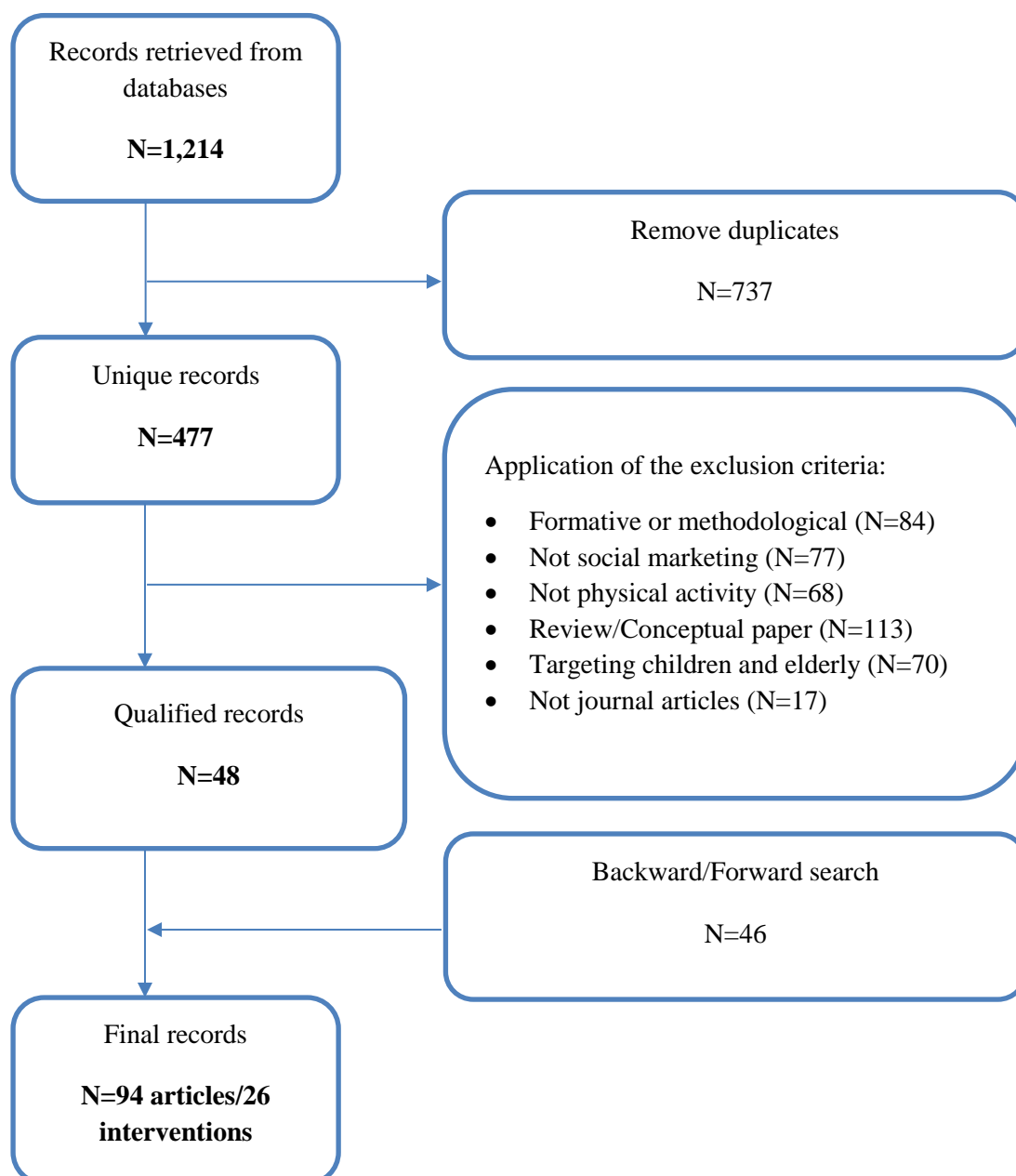
Inclusion and exclusion criteria

All downloaded records were collated using Endnote and duplicate records were removed, leaving 477 articles. Next, unqualified records including newspaper articles, conference papers and records published in languages other than English were removed. Titles and abstracts were then reviewed and records were excluded as follows: formative research, papers not identifying as marketing, review/conceptual papers, interventions targeting children and the elderly (aged 60 years and over), and interventions not targeting physical activity.

Forty-eight articles which included evaluations of social marketing interventions that aim to increase physical activity among adults (18-60 years old) were identified. Following procedures in Carins and Rundle-Thiele (2014) backward and forward searching was

undertaken to identify a further forty-six relevant papers. Backward searching was completed by examining the reference lists of journal articles for further sources that might give additional information regarding specific interventions or other social marketing interventions targeting physical activity in adults that may fit the search criteria. Forward searching was conducted using author and intervention names to search within Google Scholar and university library databases to locate additional academic papers and government reports related to specific interventions as well as additional interventions undertaken by the authors. Ninety-four articles covering twenty-six social marketing interventions were identified (see Figure 1 and Appendix 1).

Figure 1: Flowchart of the literature search process



Data extraction

All identified articles relating to each intervention were analysed to identify any potential evidence of each of Andreasen's (2002) six social marketing benchmark criteria. Evidence of social marketing benchmark criteria use was sought. For example, articles had to report use of a study which then in turn informed intervention planning and design to be classified as having formative research. Consistent with previous literature reviews using the marketing mix consisting of 4Ps (product, place, price or promotion) (Carins and Rundle-Thiele, 2014; Kubacki *et al.*, 2015), if evidence of at least two of the marketing mix elements was reported in an intervention, the intervention was classified as using a marketing mix. All identified relevant excerpts were reviewed by four social marketing researchers.

Results

Target audiences are identified in Table 2. Social marketing interventions targeted 18-60 year old adults, they were carried out in a diverse range of contexts, and often included different outcome measures. As such standard meta-analytical procedures could not be followed. Positive, negative or no effects were recorded without attempting to determine the size of the effect.

Andreasen's (2002) benchmark criteria

Table 2 presents the assessment of each of the twenty-six social marketing interventions against Andreasen's (2002) six social marketing benchmark criteria. None of the interventions gave evidence that they addressed all of the six social marketing benchmark criteria, and only four interventions addressed five criteria (Kamada *et al.*, 2013; Matsudo *et al.*, 2006; Staley, 2009; Withall *et al.*, 2012).

Table 2: Assessment of the use of Andreasen's benchmark criteria in social marketing interventions

| Intervention | Target Audience | No. of SMBC | Behavioural Objective | Audience Segmentation | Audience Research | Exchange | Marketing Mix | Competition |
|---|--|-------------|-----------------------|-----------------------|-------------------|----------|-------------------|-------------|
| <i>Fit & Fab</i> (Withall <i>et al.</i> , 2012) | Adults with children of at least school age | 5 | ✓(+) ² | ✗ | ✓ | ✓ | ✓(4) ³ | ✓ |
| <i>Get Firefighters Moving</i> (Staley, 2009) | Firefighters | 5 | ✓(+) | ✗ | ✓ | ✓ | ✓(4) | ✓ |
| <i>Agita Sao Paulo</i> (Matsudo <i>et al.</i> , 2006) | 34 million inhabitants of Sao Paulo State | 5 | ✓(+) | ✓ | ✓ | ✗ | ✓(3) | ✓ |
| <i>COMMUNICATE</i> (Kamada <i>et al.</i> , 2013) | Adults (40-79 years) | 5 | ✓(*) ⁴ | ✓ | ✓ | ✓ | ✓(4) | ✗ |
| <i>10,000 Steps Ghent</i> (De Cocker <i>et al.</i> , 2011) | Adults in Ghent community | 4 | ✓(+) | ✗ | ✓ | ✓ | ✓(3) | ✗ |
| <i>Southern India</i> (Subitha <i>et al.</i> , 2013) | 485 people, 20-49 years of age, residents of Periakattupalayam and Rangareddipalayam villages, Tamil Nadu. | 4 | ✓(+) | ✓ | ✓ | ✗ | ✗ (1) | ✓ |
| <i>Wheeling, West Virginia, Broome County and Welch Walks</i> (Reger-Nash <i>et al.</i> , 2006) | 35-65 y/o in McDowell County; 40-65 y/o in Broome County, NY; 40-65 y/o in Morgantown; 50-65 y/o in Wheeling | 4 | ✓(+) | ✓ | ✓ | ✗ | ✗ (1) | ✓ |
| <i>Bike, Walk & Wheel</i> (Sayers <i>et al.</i> , 2012) | Community | 3 | ✓(+) | ✗ | ✓ | ✗ | ✓(4) | ✗ |
| <i>Mothers for Health</i> (Keller <i>et al.</i> , 2014) | 18-35 years old Hispanic woman | 3 | ✓(+) | ✗ | ✓ | ✗ | ✓(4) | ✗ |
| <i>Activate Omaha</i> (Huberty <i>et al.</i> , 2009) | Omaha community | 3 | ✓(+) | ✗ | ✓ | ✗ | ✓(3) | ✗ |
| <i>Active Seattle</i> (Deehr and Shumann, 2009) | Five neighborhoods in Seattle | 3 | ✓(+) | ✗ | ✓ | ✗ | ✓(3) | ✗ |

² + positive behavioural outcomes reported

³ The number of Ps reported in the intervention

⁴ * no behavioural change reported

| Intervention | Target Audience | No. of SMBC | Behavioural Objective | Audience Segmentation | Audience Research | Exchange | Marketing Mix | Competition |
|---|---|--------------------|------------------------------|------------------------------|--------------------------|-----------------|----------------------|--------------------|
| <i>Canada on the Move</i> (Craig <i>et al.</i> , 2007) | Adults (18 years and older) | 3 | ✓(+) | ✗ | ✗ | ✓ | ✓(3) | ✗ |
| <i>GO Men's Health</i> (Burton <i>et al.</i> , 2009) | Men over 40 years old | 3 | ✓(+) | ✗ | ✓ | ✗ | ✓(3) | ✗ |
| <i>PATH trial</i> (Wilson <i>et al.</i> , 2010) | African American adults aged 18 and older | 3 | ✓(+) | ✗ | ✓ | ✗ | ✓(2) | ✗ |
| <i>Step up. Step out!</i> (Sharpe <i>et al.</i> , 2010) | Women aged 35-54 | 3 | ✓(+) | ✗ | ✓ | ✗ | ✓(2) | ✗ |
| <i>10,000 Steps Rockhampton</i> (Brown <i>et al.</i> , 2006) | Adults | 3 | ✓(+/*) | ✗ | ✓ | ✗ | ✓(4) | ✗ |
| <i>Cycling Connecting Communities</i> (Rissel <i>et al.</i> , 2010) | Adults (18 and older) | 3 | ✓(+/*) | ✗ | ✗ | ✓ | ✓(3) | ✗ |
| <i>Move More Diabetes</i> (Richert <i>et al.</i> , 2010) | Adults aged 30 to 70 years with type 2 diabetes | 3 | ✓(*) | ✗ | ✓ | ✗ | ✓(4) | ✗ |
| <i>Get Active Orlando</i> (McCreedy and Leslie, 2009) | Community | 3 | ✓(*) | ✗ | ✓ | ✗ | ✓(3) | ✗ |
| <i>National Park Service</i> (Hoehner <i>et al.</i> , 2010) | General park visitors and tourists, cruise ship passengers, employees of nearby businesses, and youth | 2 | ✓(+) | ✗ | ✗ | ✗ | ✓(3) | ✗ |
| <i>Find Thirty every day</i> (Leavy <i>et al.</i> , 2013) | Adults (20-54 years old) | 2 | ✓(+/*) | ✗ | ✓ | ✗ | ✗ (1) | ✗ |
| <i>Healthy Hawaii Initiative</i> (Maddock <i>et al.</i> , 2006) | Community; Adults (18+ for media campaigns) Main focus on 35-55 year olds | 2 | ✓ (+/*) | ✗ | ✓ | ✗ | ✗ (1) | ✗ |
| <i>Get Up and Do Something</i> (Peterson <i>et al.</i> , 2005) | Adults (18 to 30 year old) | 2 | ✓(*) | ✗ | ✓ | ✗ | ✗ (1) | ✗ |
| <i>ParticipACTION</i> (Bauman <i>et al.</i> , 2009) | Parents, community | 2 | ✓(*) | ✗ | ✓ | ✗ | ✗ (1) | ✗ |
| <i>Slavic Village Development</i> (Miller <i>et al.</i> , 2009) | Community | 2 | ✗ (+) | ✗ | ✓ | ✗ | ✓ (2) | ✗ |
| <i>Salsa y Salud</i> (Henoa <i>et al.</i> , 2006) | Hispanic population aged of 18 and over in northeastern Florida | 0 | ✗ (*) | ✗ | ✗ | ✗ | ✗ (1) | ✗ |

Behavioural objective

The main goal of social marketing intervention is behaviour change (Coffman, 2002). Twenty out of the twenty-six interventions reported some positive behavioural effects, while five interventions reported no behavioural change for their target audiences (Bauman *et al.*, 2009; Henao *et al.*, 2006; Kamada *et al.*, 2013; McCreedy and Leslie, 2009; Peterson *et al.*, 2005). None of the reviewed interventions reported any negative behavioural outcomes. For example, *10,000 Steps Ghent* (De Cocker *et al.*, 2011) reported an average increase of 896 steps per day in Ghent (the intervention community) while a concurrent decrease of 135 steps/day in Aalst (the control community) was reported. Seven of the campaigns also aimed to change or influence policies (Brown *et al.*, 2006; Deehr and Shumann, 2009; Huberty *et al.*, 2009; McCreedy and Leslie, 2009; Miller and Scofield, 2009; Sayers *et al.*, 2012; Sharpe *et al.*, 2010). For example, one of the main aims of *Slavic Village Development* (Miller and Scofield, 2009) was to develop municipal projects, policies, and plans that encourage physical activity.

Segmentation

Segmentation was proposed (Andreasen, 2002) to “ensure maximum efficiency and effectiveness in the use of scarce resources” (p.104) in heterogeneous populations as groups with similar needs and wants can be identified (Evers *et al.*, 2013). Only four social marketing interventions reported using segmentation, and three of them delivered positive behavioural outcomes (Matsudo *et al.*, 2006; Reger-Nash *et al.*, 2006; Subitha *et al.*, 2013) and the fourth intervention reporting use of segmentation did not report behavioural outcomes (Kamada *et al.*, 2013). *Agita Sao Paulo* (Matsudo *et al.*, 2006) was a multilevel, community-wide intervention aimed at all inhabitants of the Sao Paulo state in Brazil. The intervention targeted the three segments and developed programs and materials specifically for each

group: students, workers and people over 60 years old. Segmentation was also reported in *Wheeling, West Virginia, Broome County and Welch Walks* intervention (Reger-Nash *et al.*, 2006), where supplementary advertisements were used for the African American community featuring African American actors to appeal to the regional minority population. *COMMUNICATE* (Kamada *et al.*, 2013) promoted aerobic activity to two different segments and basic audience segmentation was also conducted in the Southern India campaign (Subitha *et al.*, 2013). The villagers were divided into 30 small groups of 12-15 members based on the convenience of exercise timing.

Formative research

Formative research provides an opportunity to learn about the target audience and how to best design an intervention for that specific audience (Andreasen, 2002). Use of focus groups and surveys was the most popular combination. Twenty-two interventions used one or more formative research methods (see Table 2). Focus groups (n=13), interviews (n=8) and surveys (n=8) were the most popular. Including additional stakeholders outside of the target audience in formative research is a good way to learn unique insights and obtain the endorsement of secondary groups. For example, *10,000 Steps Rockhampton* (Brown *et al.*, 2006) used discussions with experts, interviews and meetings with key informants in the local community (from the health, education, local government, sport and recreation, media and non-government sectors) as well as with Rockhampton residents. Thirteen interventions reported use of two or more formative research methods to inform intervention development (Bauman *et al.*, 2009; Burton *et al.*, 2009; Deehr and Shumann, 2009; Leavy *et al.*, 2013; Maddock *et al.*, 2006; Matsudo *et al.*, 2006; Miller and Scofield, 2009; Peterson *et al.*, 2005; Reger-Nash *et al.*, 2006; Richert *et al.*, 2007; Sharpe *et al.*, 2010; Staley, 2009; Withall *et al.*,

2012). Four interventions did not report use of formative research (Craig *et al.*, 2007; Henao *et al.*, 2006; Hoehner *et al.*, 2010; Rissel *et al.*, 2010).

Exchange

French and Blair-Stevens (2006) describe exchange as something that a person has to give up in order to get a proposed benefit. In this review exchange was treated as “direct exchange”, meaning that something tangible or intangible needs to be given up in order to obtain the desired bundle of benefits delivered by the intervention. Understanding what the alternatives are to the desired behaviour can provide insight into what would represent a valuable exchange to the target audience. Six interventions identified in this review included clear evidence of exchange (Craig *et al.*, 2007; De Cocker *et al.*, 2011; Kamada *et al.*, 2013; Rissel *et al.*, 2010; Staley, 2009; Withall *et al.*, 2012). In the intervention *10,000 Steps Ghent* (De Cocker *et al.*, 2011) pedometers were sold to the public for \$20 to increase the community’s levels of physical activity. *Canada on the Move* (Craig *et al.*, 2007) used the same strategy; however they partnered with Kellogg’s Canada and put the pedometer inside a cereal box. Consumers had to purchase the cereal to be able to access the pedometers during the intervention. In *Cycling Connecting Communities* (Rissel *et al.*, 2010) members of the public were offered community bike rides (organised bicycle events) as a part of the intervention and free bike hire. The intervention designers had understood the principles of exchange offering the bike hire for no cost to increase the number of people in the community bike rides. The *Fit & Fab* campaign (Withall *et al.*, 2012) offered dance and gym sessions free for the first six weeks and from then the cost was £1.

Marketing mix (4 Ps)

Social marketing campaigns involve the use of multiple strategies, including the 4Ps of the traditional marketing mix: product, price, place, and promotion (Evers *et al.*, 2013) which formed the basis of our assessment. Seven interventions employed the entire marketing mix and eight interventions used three elements of the marketing mix (see Table 2). All interventions reported use of promotion, and seven interventions relied solely on promotions to achieve their aims (Bauman *et al.*, 2009; Henao *et al.*, 2006; Leavy *et al.*, 2013; Maddock *et al.*, 2006; Peterson *et al.*, 2005; Reger-Nash *et al.*, 2006; Subitha *et al.*, 2013).

Product is the bundle of benefits derived from an exchange by the target audience and is typically thought of as the goods/services required to support the desired behaviour (Lee and Kotler, 2011). A majority of the interventions in this review reported using products (n=19). For example, light-reflective material for walking safety, and videotapes and DVDs on flexibility and muscle-strengthening activities were products reported in interventions reviewed. Bikes and helmets were provided to underserved youth in *Activate Omaha* (Huberty *et al.*, 2009) while *Bike, Walk, and Wheel* (Sayers *et al.*, 2012) provided refurbished bikes through their Cycle-Recycle program. Further, intangible products or services were included walking and cycling events offered in eight interventions.

Evidence of promotion was identified in all twenty-six interventions. A wide range of promotional tools were used to raise awareness, enforce a particular message or to promote social marketing activities. The most commonly used tools were flyers, posters, banners, brochures and other print materials (n=19), followed by public relations activities such as press conferences, public service announcements, newsletters, public lectures, reports, TV programs, radio broadcasts, and appearances on local radio talk shows (n=13). Eleven interventions reported having a website: *Fit & Fab* (Withall *et al.*, 2012) reported having a

campaign blog, and the *National Park Service* (Hoehner *et al.*, 2010) campaign reported using podcasts to increase trial use among employees of nearby businesses. Six interventions reported using TV advertising, seven reported using radio advertising, and five reported billboard use.

Place as a location where the target audience enters into an exchange was identified in thirteen interventions, six of them focused on improving local physical activity infrastructure. *Bike, Walk, and Wheel* (Sayers *et al.*, 2012) had place at the centre of its aims as it sought to implement policies to support activity friendly locations. The campaign successfully improved the sidewalks surrounding schools and introduced new street design standards. *Active Seattle* (Deehr and Shumann, 2009) focused on changing behaviours using the infrastructure and modified school environments in five neighbourhoods in Seattle, while *Get Active Orlando* (McCreehy and Leslie, 2009) used the improvements in the physical environment in Orlando's Community Redevelopment Area to support active living.

Price as the cost or sacrifice exchanged for the product was explicitly identified in four interventions and included time and psychological costs. Adoption costs in social marketing may be monetary or non-monetary in nature, including time, effort and energy required to perform the behaviour, perceived psychological risks and losses, and physical discomforts that may be associated with the behaviour (Lee and Kotler, 2011). The cost of pedometers was included in three interventions: *10,000 Steps Ghent* (A\$20) (De Cocker *et al.*, 2011), *10,000 Steps Rockhampton* (the actual cost was not reported) (Brown *et al.*, 2006), and *Canada on the Move* (the cost of purchasing a Kellogg's cereal box which included a pedometer) (Craig *et al.*, 2007). In *Fit & Fab* (Withall *et al.*, 2012) in the first six weeks of the intervention all sessions were free, and then the cost was £1 in the following weeks.

Psychological costs were also considered in Kamada *et al.* (2013) and Staley (2009), and included a fear of pain worsening, anxiety about effectiveness, social pressure and subsequent embarrassment for poor performance or nonparticipation.

Competition

Andreasen's (2002) social marketing benchmark criteria require recognising and addressing the competition of the behaviour targeted by an intervention. The social marketer has to understand what other behaviours are competing for the chosen target audience's time and attention in order to develop strategies that minimize the impact of the competition (Andreasen, 2002). Five interventions mentioned competition to their desired behaviour(s) (Matsudo *et al.*, 2006; Staley, 2009; Subitha *et al.*, 2013; Reger-Nash *et al.*, 2006; Withall *et al.*, 2012), three interventions identified sedentary behaviours, including watching television, as competition to the desired behaviour. *Fit & Fab* (Withall *et al.*, 2012) identified pre-existing sessions in the leisure centre as being in direct competition with participation in classes offered in the intervention. *Get Firefighters Moving* (Staley, 2009) identified the most extensive types of competition that affected their target audience's ability to fully participate in the intervention, and it ranged from on-duty activities such as the emergency or disaster response activities performed by firefighters, through to unhealthy lifestyles, social and cultural norms, and local government policies restricting the time available for new fitness activities.

Discussion

The aims of this systematic review were to provide a contemporary understanding of the effectiveness of social marketing to increase physical activity among adults aged 18-60 years old and to ascertain the extent to which the six social marketing benchmark criteria were

reported in social marketing interventions aiming to increase physical activity among adults. The review indicates that the overwhelming majority of the identified social marketing interventions reported positive behavioural change, and no negative behavioural outcomes were reported. Consistent with Stead *et al.* (2006) the evidence gathered in our review suggests that social marketing offers an effective behavioural change approach to increase physical activity among adults.

Previous research indicates that behaviour change is more likely when more of the social benchmark criteria are used (Carins and Rundle-Thiele, 2014), yet none of the interventions in this review reported use of all six of Andreasen's (2002) benchmark criteria. Six out of seven (85%) interventions reporting evidence of at least four of the benchmark criteria reported positive behavioural outcomes; however, only four out of seven (57%) interventions which reported using two or less benchmark criteria reported positive behavioural outcomes for some of their target audience, and only two (29%) reported positive behavioural outcomes for their entire target audiences. The findings therefore indicate that increasing the number of benchmark criteria used in an intervention to at least four substantially increases the chances of achieving positive behavioural outcomes.

The application of Andreasen's (2002) social marketing benchmark criteria offers additional insights for researchers and practitioners planning campaigns to increase and sustain physical activity levels in adult populations. Our results also show that three of the benchmark criteria, namely behavioural objectives, formative research and marketing mix are well utilised in social marketing interventions aiming to increase physical activity, which is consistent with previous social marketing systematic reviews (Carins and Rundle-Thiele, 2014; Kubacki *et al.*, 2015). Among ten interventions which reported no behavioural change for all or some of

their target audiences, only one intervention reported evidence of segmentation (Kamada *et al.*, 2013). Limited evidence of market segmentation, exchange or competition was reported in the remaining interventions reporting no behavioural change. Again this is consistent with previous social marketing systematic reviews (Carins and Rundle-Thiele, 2014; Kubacki *et al.*, 2015), which might be symptomatic of a larger issue in social marketing interventions: although the importance of social marketing benchmark criteria of segmentation, exchange and competition continue to be presented as a cornerstone of social marketing theory (Andreasen, 2002; French and Blair-Stevens, 2006), their reported use in practice remains limited. There is therefore opportunity for future umbrella reviews to be carried out focusing on each of the three under-utilised benchmark criteria to identify issues limiting their use.

It is also important to note that at least some positive behavioural outcomes were reported in three out of four interventions reporting the use of segmentation, in five out of six interventions reporting the use of exchange, and in all five interventions reporting the use of competition. Taken together the results of the current study indicate the potential importance of segmentation, exchange and competition in creating social marketing interventions tailored to the diverse needs and lifestyles of different groups within the targeted population to achieve behaviour change. There is considerable opportunity to focus attention on application of exchange, competition and segmentation in future social marketing interventions.

Present findings also provide additional evidence to further support earlier findings (e.g. Carins and Rundle-Thiele, 2014) that social marketing interventions employing more than just promotion in their marketing mix deliver better results. Only two out of promotion-only interventions reported positive behavioural outcomes for all target audiences, and the remaining five interventions reported no positive behavioural outcomes for some or all of

their target audiences. The promotion-only interventions included television and radio advertising and what has been referred to as SPLAT (Some Posters, Leaflets, Ads and Things; French and Gordon, 2015). While promotion is an important ingredient of social marketing that can be used to raise awareness, induce trial and remind the target audience to repurchase, social advertising or communications-only campaigns do not deliver an alternate exchange offering. Evidence indicates that social advertising and communication are not as effective as social marketing interventions making full use of the marketing mix (see Carins and Rundle-Thiele, 2014), suggesting clear distinctions must be made between the two approaches to delineate social marketing from social advertising. These findings provide further support for Carins and Rundle-Thiele's (2014) study in healthy eating indicating the potential importance of employing a marketing mix to combat obesity. Our review provides a compelling justification for the use of market segmentation, exchange, competition analysis and more than one component of the marketing mix to increase the effectiveness of social marketing interventions targeting physical activity and obesity in general.

The findings of this study should be considered in the light of several important limitations. First, only interventions which self-identified as social marketing were included in our analysis. Undoubtedly there are physical activity interventions which used social marketing tools and techniques yet did not self-identify as a social marketing study permitting retrieval in our systematic search. Although offering a potentially fruitful area for investigation, this review included only interventions that were presented as social marketing. Given that other behaviour change disciplines including education, training, enforcement, infrastructure, technology, urban planning, community development, and health promotion can be equally effective in delivering change, a systematic review capturing all physical activity intervention types is recommended to extend our understanding further.

Second, analysis presented in this paper is restricted to information that was reported in the identified studies and available online information, which might be an incomplete representation of work undertaken. The outcome of this review which identified that interventions did not report all six social marketing benchmark criteria does not necessarily mean corresponding activities were not implemented, such as formative research and segmentation. Future research is encouraged to present a brief overview of the social marketing process, ensuring transparency, and in turn future assessments that can be made more reliably about social benchmark criteria use to develop an understanding of the common factors of effective social marketing interventions. Evidence has emerged indicating that behaviour change is more likely when more of the six social marketing benchmark criteria are employed (see Carins and Rundle-Thiele, 2014). It is therefore important for social marketing researchers to present both the outcomes of their intervention and the process used to develop the intervention. Full reporting of the process used in intervention design, planning, implementation and evaluation would permit future systematic reviews of evidence to accurately identify common factors in effective interventions. An understanding of the common factors employed in effective interventions will in turn affect the design and implementation of future programs as well as the development of the social marketing discipline as a whole.

Third, it is important to acknowledge that although the review aimed to cover adults aged 18-60 years old, some of the identified interventions defined their target markets more broadly. For example, although *Get Active Orlando* was aimed at “seniors, families, and low-income individuals” (McCreeley and Leslie, 2009:S398), it was inferred that adults were an important part of the intervention’s target market. It is possible *Get Active Orlando* reached a target

audience aged under the age of 18 years. Fourth, following analysis presented in earlier social marketing reviews (e.g. Carins and Rundle-Thiele, 2014; Kubacki et al., 2015) the current study employed the 4P marketing mix framework. However, future studies should consider using the 7P framework (product, place, price, promotion, people, process and physical evidence) to gain a more comprehensive understanding of intangible components employed in social marketing interventions. Fifth, all but four of the interventions identified in this study were conducted in English speaking countries, yet insufficient physical activity remains a global challenge. Future reviews should be conducted in other languages to review studies and interventions which might be published in languages other than English. Sixth, Andreasen's (2002) six social marketing benchmark criteria were used in this study, and future work should consider alternative benchmark criteria (for example, French and Blair-Stevens, 2006; Robinson-Maynard *et al.*, 2013), effectiveness assessment, and quality assessment tools such as the Evaluation of Public Health Practice Projects (EPHPP) which requires an assessment of selection bias, study design, confounders, blinding, data collection methods, withdrawals and dropouts (Chillón *et al.*, 2011).

References

AASM, ISMA, and ESMA. (2013), *Consensus definition of social marketing*. Available:

http://www.i-socialmarketing.org/assets/social_marketing_definition.pdf [accessed 22 April 2015].

Andreasen, A.R. (2002), "Marketing social marketing in the social change marketplace", *Journal of Public Policy & Marketing*, Vol. 21 No. 1, pp. 3-13.

Bauman, A., Cavill, N. and Brawley, L. (2009), "ParticipACTION: the future challenges for physical activity promotion in Canada", *International Journal of Behavioral Nutrition and Physical Activity*, Vol. 6 No. 1, pp. 89.

Berkowitz, J.M., Huhman, M. and Nolin, M.J. (2008), "Did augmenting the VERB™ campaign advertising in select communities have an effect on awareness, attitudes, and physical activity? *American Journal of Preventive Medicine*, Vol. 34 No. 6, pp. S257-S266.

Brown, W.J., Mummery, K., Eakin, E. and Schofield, G. (2006). "10,000 Steps Rockhampton: evaluation of a whole community approach to improving population levels of physical activity", *Journal of Physical Activity & Health*, Vol. 3 No. 1, pp. 1-14.

Burton, A., Atherton, M. and Nygaard, A. (2009), "GO Men's Health program", *Social Marketing Quarterly*, Vol. 15 No. 2, pp. 39.

Carins, J.E. and Rundle-Thiele, S.R. (2014), "Eating for the better: a social marketing review (2000–2012)", *Public Health Nutrition*, Vol. 17 No. 7, pp. 1628-39.

Cerin, E., Leslie, E., Sugiyama, T. and Owen, N. (2010), "Perceived barriers to leisure-time physical activity in adults: An ecological perspective", *Journal of Physical Activity and Health*, Vol. 7, pp. 451-459.

Chillón, P., Evenson, K. R., Vaughn, A., & Ward, D. S. (2011), "A systematic review of interventions for promoting active transportation to school", *International Journal of Behavioral Nutrition and Physical Activity*, Vol. 8 No. 1, pp. 10.

Chilton, R., Pearson, M. and Anderson, R. (2015), "Health promotion in schools: a scoping review of systematic reviews", *Health Education*, Vol. 115 No. 3/4, pp. 357-376.

- Coffman, J. (2002), *Public communication campaign evaluation: an environmental scan of challenges, criticisms, practice and opportunities*. Harvard Family Research, Cambridge, MA.
- Craig, C.L., Tudor-Locke, C. and Bauman, A. (2007), “Twelve-month effects of Canada on the Move: a population-wide campaign to promote pedometer use and walking”, *Health Education Research*, Vol. 22 No. 3, pp. 406-413.
- De Cocker, K.A., De Bourdeaudhuij, I.M., Brown, W.J. and Cardon, G.M. (2011), “Four-year follow-up of the community intervention ‘10 000 steps Ghent’”, *Health Education Research*, Vol. 26 No. 2, pp. 372-380.
- Deehr, R.C. and Shumann, A. (2009), “Active Seattle achieving walkability in diverse neighborhoods”, *American Journal of Preventive Medicine*, Vol. 37 No. 6, pp. S403-S411.
- Dietrich, T., Rundle-Thiele, R., Schuster, L. and Connor, J.P. (2016), “A systematic literature review of alcohol education programmes in middle and high school settings (2000-2014)”, *Health Education*, Vol. 116 No. 1, pp. 50-68.
- Evers, U., Jones, S.C., Caputi, P. and Iverson, D. (2013), “Promoting asthma awareness to older adults: formative research for a social marketing campaign”, *Journal of Asthma & Allergy Educators*, Vol. 4 No. 2, pp. 77-84.
- French, J. and Blair-Stevens, C. (2006), *Social Marketing National Benchmark Criteria*. London: UK
- French, J. and Gordon, R. (2015), *Strategic Social Marketing*, SAGE Publications Ltd, London.
- Gordon, R., McDermott, L., Stead, M. and Angus, K. (2006), “The effectiveness of social marketing interventions for health improvement: what’s the evidence?”, *Public Health*, Vol. 120 No. 12, pp. 1133-1139.
- Hartling, L., Vandermeer, B. and Fernandes, R.M. (2014), “Systematic reviews, overviews of reviews and comparative effectiveness reviews: a discussion of approaches to knowledge synthesis”, *Evidence-Based Child Health*, Vol. 9, pp. 486-494.

- Henao, J.C., Rodriguez, J. and Wilbum, S.T. (2006), "Salsa y Salud: increasing healthy lifestyle awareness through a radio-based initiative", *Journal of Nutrition Education & Behavior*, Vol. 38 No. 4, pp. 267-268.
- Hoehner, C.M., Brownson, R.C., Allen, D., Gramann, J., Behrens, T.K., Floyd, M.F. and Yount, B.W. (2010), "Parks promoting physical activity: synthesis of findings from interventions in seven national parks", *Journal of Physical Activity & Health*, Vol. 7, pp. S67-S81.
- Huberty, J.L., Dodge, T., Peterson, K. and Balluff, M. (2009), "Activate Omaha: the journey to an active living environment", *American Journal of Preventive Medicine*, Vol. 37 No. 6 Suppl 2, pp. S428-435.
- Kamada, M., Kitayuguchi, J., Inoue, S., Ishikawa, Y., Nishiuchi, H., Okada, S. and Shiwaku, K. (2013), "A community-wide campaign to promote physical activity in middle-aged and elderly people: a cluster randomized controlled trial", *International Journal of Behavioral Nutrition and Physical Activity*, Vol. 10.
- Keller, C., Vega-Lopez, S. Ainsworth, B., Nagle-Williams, A., Records, K., Permana, P. and Coonrod, D. (2014), "Social marketing: approach to cultural and contextual relevance in a community-based physical activity intervention", *Health Promotion International*, Vol. 29 No. 1, pp. 130-140.
- Kubacki, K., Rundle-Thiele, S., Pang, B. and Buyucek, N. (2015), "Minimising alcohol harm: a systematic social marketing review (2000-2014)", *Journal of Business Research*, Vol. 68 No. 10, pp. 2214-2222.
- Leavy, J.E., Rosenberg, M., Bauman, A.E., Bull, F.C., Giles-Corti, B., Shilton, T., . . . and Barnes, R. (2013), "Effects of Find Thirty every day® cross-sectional findings from a Western Australian population-wide mass media campaign, 2008-2010", *Health Education & Behavior*, Vol. 40 No. 4, pp. 480-492.
- Lee N. and Kotler, P. (2011), *Social Marketing: Influencing Behaviors for Good*. Sage Publications.
- Levebvre, R.C. and Flora, J.A. (1988), "Social marketing and public health intervention", *Health Education Quarterly*, Vol. 15, pp. 299.

- Maddock, J., Takeuchi, L., Nett, B., Tanaka, C., Irvin, L., Matsuoka, C. and Wood, B. (2006), "Evaluation of a statewide program to reduce chronic disease: The Healthy Hawaii Initiative, 2000–2004", *Evaluation and Program Planning*, Vol 29 No. 3, pp. 293-300.
- Matsudo, S.M., Matsudo, V.K.R., Andrade, D.R., Araujo, T.L. and Pratt, M. (2006), "Evaluation of a physical activity promotion program: the example of Agita São Paulo", *Evaluation and Program Planning*, Vol. 29 No. 3, pp. 301-311.
- McCreedy, M. and Leslie, J.G. (2009), "Get Active Orlando: changing the built environment to increase physical activity", *American Journal of Preventive Medicine*, Vol. 37 No. 6, Supplement 2, pp. S395-S402.
- Miller, E.K. and Scofield, J.L. (2009), "Slavic Village: incorporating active living into community development through partnerships", *American Journal of Preventive Medicine*, Vol. 37 No. 6, pp. S377-S385.
- Peterson, M., Abraham, A. and Waterfield, A. (2005), "Marketing physical activity: lessons learned from a statewide media campaign", *Health Promotion Practice*, Vol. 6 No. 4, pp. 437-446.
- Reger-Nash, B., Bauman, A., Cooper, L., Chey, T. and Simon, K.J. (2006), "Evaluating communitywide walking interventions", *Evaluation and Program Planning*, Vol. 29 No. 3, pp. 251-259.
- Richert, M.L., Webb, A.J., Morse, N.A., O'Toole, M.L. and Brownson, C.A. (2007), "Move More Diabetes: using lay health educators to support physical activity in a community-based chronic disease self-management program", *Diabetes Educator*, Vol. 33, pp. 179S-184.
- Rissel, C.E., New, C., Wen, L.M., Merom, D., Bauman, A.E. and Garrard, J. (2010), "The effectiveness of community-based cycling promotion: findings from the Cycling Connecting Communities project in Sydney, Australia", *International Journal of Behavioral Nutrition and Physical Activity*, Vol. 7 No. 1, pp. 8.
- Robinson-Maynard, A., Meaton, J. and Lowry, R. (2013), "Identifying key criteria as predictors of success in social marketing: Establishing an evaluation template and grid", In: Kubacki, K. and Rundle-Thiele, S. (eds.) *Contemporary Issues in Social Marketing*, Cambridge Scholars Publishing.

- Rothschild, M.L. (1999), “Carrots, sticks, and promises: a conceptual framework for the management of public health and social issue behaviors”, *Journal of Marketing*, Vol. 63 No. 4, pp. 24-37.
- Sayers, S.P., LeMaster, J.W., Thomas, I.M., Petroski, G.F. and Ge, B. (2012), “Bike, walk, and wheel: a way of life in Columbia, Missouri, revisited”, *American Journal of Preventive Medicine*, Vol. 43 No. 5, pp. 379-383.
- Sharpe, P.A., Burroughs, E.L., Granner, M.L., Wilcox, S., Hutto, B.E., Bryant, C.A. and Pekuri, L. (2010), “Impact of a community-based prevention marketing intervention to promote physical activity among middle-aged women”, *Health Education & Behavior*, Vol. 37 No. 3, pp. 403-423.
- Staley, J.A. (2009), “‘Get Firefighters Moving’: marketing a physical fitness intervention to reduce sudden cardiac death risk in full-time firefighters”, *Social Marketing Quarterly*, Vol. 15 No. 3, pp. 85-99.
- Stead, M., Gordon, R., Angus, K. and McDermott, L. (2007), “A systematic review of social marketing effectiveness”, *Health Education*, Vol. 107 No. 2, pp. 126-191.
- Subitha, L., Soudarssanane, M.B. and Murugesan, R. (2013), “Community-based physical activity intervention using principles of social marketing: a demonstration project in Southern India”, *National Medical Journal of India*, Vol. 26 No. 1, pp. 12-17.
- Tapp, A. and Rundle-Thiele, S.R. (2016), “Integrating social marketing into a multi-disciplinary environment behaviour change: Past, present and future”, in: Spotswood, F. (Ed.) *Beyond Behaviour Change*. Bristol: Policy Press.
- Trost, S., Owen, N., Bauman, A.E., Sallis, J. and Brown, W. (2002), “Correlates of adults’ participation in physical activity: Review and update”, *Medicine and Science in Sports and Exercise*, Vol. 34 No. 12, pp. 1996-2001.
- Truong, V.D. (2014), “Social marketing: a systematic review of research 1998–2012”, *Social Marketing Quarterly*, Vol. 20 No. 1, pp. 15-34.
- WHO (2015), *Physical activity*. Available: http://www.who.int/topics/physical_activity/en/ [accessed 22 April 2015].

- Wilson, D.K., Trumpeter, N.N., St. George, S.M., Coulon, S.M., Griffin, S., Lee Van Horn, M. and Gadson, B. (2010), "An overview of the 'Positive Action for Today's Health' (PATH) trial for increasing walking in low income, ethnic minority communities", *Contemporary Clinical Trials*, Vol. 31 No. 6, pp. 624-633.
- Withall, J., Jago, R. and Fox, K.R. (2012), "The effect of a community-based social marketing campaign on recruitment and retention of low-income groups into physical activity programmes - a controlled before-and-after study", *BMC Public Health*, Vol. 12, pp. 836.
- Zlot, A.I., Librett, J., Buckner, D. and Schmid, T. (2006), "Environmental, transportation, social, and time barriers to physical activity", *Journal of Physical Activity and Health*, Vol. 3, pp. 15-21.

| Intervention | Articles included |
|--------------------------------|---|
| <i>Fit & Fab</i> | <p>Withall, J., Jago, R., & Fox, K. R. (2012), “The effect a of community-based social marketing campaign on recruitment and retention of low-income groups into physical activity programmes - a controlled before-and-after study”, <i>BMC Public Health</i>, Vol. 12, pp. 836.</p> <p>Withall, J., Jago, R., & Fox, K. (2011), “Who attends physical activity programmes in deprived neighbourhoods?”, <i>Health Education Journal</i>, Vol. 70 No. 2, pp. 206-216.</p> <p>Withall, J., Jago, R., & Fox, K. R. (2011), “Why some do but most don't. Barriers and enablers to engaging low-income groups in physical activity programmes: a mixed methods study”, <i>Bmc Public Health</i>, Vol. 11 No. 1, pp. 1</p> |
| <i>Get Firefighters Moving</i> | <p>Staley, J. A. (2009), “"Get Firefighters Moving": Marketing a Physical Fitness Intervention to Reduce Sudden Cardiac Death Risk in Full-Time Firefighters”, <i>Social Marketing Quarterly</i>, Vol. 15 No. 3, pp. 85-99.</p> |
| <i>Agita Sao Paulo</i> | <p>Matsudo, S. M. (2011). “Agita São Paulo full case study”, available at : http://www.thensmc.com/resources/showcase/agita-s%C3%A3o-paulo?view=all (accessed 13th April 2016)</p> <p>Matsudo, S. M., Matsudo, V. K. R., Andrade, D. R., Araujo, T. L., & Pratt, M. (2006), “Evaluation of a physical activity promotion program: the example of Agita São Paulo”, <i>Evaluation and Program Planning</i>, Vol. 29 No. 3, pp. 301-311.</p> <p>Matsudo, S. M., Matsudo, V. R., Araujo, T. L., Andrade, D. R., Andrade, E. L., Oliveira, L. C. D., & Braggion, G. F. (2003), “The Agita São Paulo Program as a model for using physical activity to promote health”, <i>Revista panamericana de salud pública</i>, Vol. 14 No. 4, pp. 265-272.</p> <p>Matsudo, V. (2012), “The role of partnerships in promoting physical activity: the experience of Agita São Paulo”, <i>Health & place</i>, Vol. 18 No. 1, pp. 121-122.</p> <p>Matsudo, V., Matsudo, S., Andrade, D., Araujo, T., Andrade, E., de Oliveira, L. C., & Braggion, G. (2002), “Promotion of physical activity in a developing country: The Agita São Paulo experience”, <i>Public Health Nutrition</i>, Vol. 5 No. 1a, pp. 253-261.</p> <p>Matsudo, V., Andrade, D., Matsudo, S., Araujo, T., Andrade, E., de Oliveira, L. C., & Braggion, G. (2002), “The "Agita Sao Paulo" model in promoting physical activity”. <i>Progress in obesity research</i>.</p> <p>Matsudo, V., Matsudo, S. M., Araújo, T. L., Andrade, D. R., Oliveira, L. C., & Hallal, P. C. (2010), “Time trends</p> |

| | |
|--------------------|---|
| | in physical activity in the state of Sao Paulo, Brazil: 2002-2008”, <i>Medicine and Science in Sports and Exercise</i> , Vol. 42 No. 12, pp. 2231-2236. |
| COMMUNICATE | <p>Kamada, M., Kitayuguchi, J., Inoue, S., & Shiwaku, K. (2012), “Community-wide campaign using social marketing to promote physical activity in middle and old-aged people: A cluster randomized controlled trial”, <i>Journal of Science and Medicine in Sport</i>, Vol. 15, pp. 206.</p> <p>Kamada, M., Kitayuguchi, J., Inoue, S., Ishikawa, Y., Nishiuchi, H., Okada, S., Shiwaku, K. (2013), “A community-wide campaign to promote physical activity in middle-aged and elderly people: a cluster randomized controlled trial”, <i>International Journal of Behavioral Nutrition and Physical Activity</i>, Vol. 10 No. 1, pp. 44.</p> |
| 10,000 Steps Ghent | <p>De Cocker, K., Cardon, G., Brown, W., & De Bourdeaudhuij, I. (2007), “Effects of ‘10,000 Steps Ghent’: A multi-strategy physical activity intervention in a community”, Sixth Annual Conference of the International Society of Behavioral Nutrition and Physical Activity, 2007, pp. 78.</p> <p>De Cocker, K., Cardon, G., & De Bourdeaudhuij, I. (2006), “Validity of the inexpensive Stepping Meter in counting steps in free living conditions: a pilot study”, <i>British Journal of Sports Medicine</i>, Vol. 40 No. 8, pp. 714-716.</p> <p>De Smedt, D., De Cocker, K., Annemans, L., De Bourdeaudhuij, I., & Cardon, G. (2012), “A cost-effectiveness study of the community-based intervention ‘10 000 Steps Ghent’”, <i>Public Health Nutrition</i>, Vol. 15 No. 3, pp. 442-451.</p> <p>De Cocker, K. A., De Bourdeaudhuij, I. M., Brown, W. J., & Cardon, G. M. (2011), “Four-year follow-up of the community intervention ‘10 000 steps Ghent’”, <i>Health Education Research</i>, Vol. 26 No. 2, pp. 372-380.</p> <p>De Cocker, K., De Bourdeaudhuij, I., Brown, W., & Cardon, G. (2008), “Moderators and mediators of pedometer use and step count increase in the “10,000 Steps Ghent” intervention”, <i>The International Journal of Behavioral Nutrition and Physical Activity</i>, Vol. 6 No. 1, pp. 3.</p> <p>Van Acker, R., De Bourdeaudhuij, I., De Cocker, K., Klesges, L. M., & Cardon, G. (2011), “The impact of disseminating the whole-community project ‘10,000 Steps’: a RE-AIM analysis”, <i>Bmc Public Health</i>, Vol. 11 No. 1, pp. 3.</p> |
| Southern India | Subitha, L., Soudarssanane, M. B., & Murugesan, R. (2013), “Community-based physical activity intervention using principles of social marketing: a demonstration project in Southern India”, <i>National Medical Journal of</i> |

| | |
|--|--|
| | <p><i>India</i>, Vol. 26, No. 1, pp. 12-17.</p> <p>Subitha, L., Soudarssanane, M.B., Murugesan, R., & Kannan, G. (2012), “Effectiveness of physical activity promotion in blood pressure and blood sugar reduction: A community–based intervention study in rural south India”, <i>Journal of Family & Community Medicine</i>, Vol. 19 No. 2, pp. 81.</p> |
| <p><i>Wheeling, West Virginia, Broome County and Welch Walks</i></p> | <p>Gebel, K., Bauman, A. E., Reger-Nash, B., & Leyden, K. M. (2011), “Does the Environment Moderate the Impact of a Mass Media Campaign to Promote Walking?”, <i>American Journal of Health Promotion</i>, Vol. 26 No. 1, pp. 45-48.</p> <p>Reger-Nash, B., Bauman, A., Booth-Butterfield, S., Cooper, L., Smith, H., Chey, T., & Simon, K. J. (2005), “Wheeling walks: evaluation of a media-based community intervention”, <i>Family & community health</i>, Vol. 28 No. 1, pp. 64-78.</p> <p>Reger-Nash, B., Bauman, A., Cooper, L., Chey, T., and Simon, K. J. (2006). "Evaluating communitywide walking interventions." <i>Evaluation and Program Planning</i>, Vol. 29 No. 3, pp. 251-259.</p> <p>Reger-Nash, B., Bauman, A., Cooper, L., Chey, T., Simon, K. J., Brann, M., & Leyden, K. M. (2008), “@@iWV Walks@: Replication With Expanded Reach”, <i>Journal of Physical Activity and Health</i>, Vol. 5 No. 1, pp. 19-27.</p> <p>Reger-Nash, B., Cooper, L., Booth-Butterfield, S., Smith, H., Bauman, A., Wootan, M., Greer, F. (2002), “Wheeling Walks: a community campaign using paid media to encourage walking among sedentary older adults”, <i>Preventive Medicine</i>, Vol. 35 No. 3, pp. 285-292.</p> <p>Reger-Nash, B., Cooper, L., Orren, J., & Cook, D. (2005), “Marketing used to promote walking in McDowell county”, <i>West Virginia Medical Journal</i>, Vol. 101 No. 3, pp. 106.</p> <p>Reger-Nash, B., Fell, P., Spicer, D., Fisher, B. D., Cooper, L., Chey, T., & Bauman, A. (2006), “BC Walks: replication of a communitywide physical activity campaign”, <i>Preventing Chronic Disease</i>, Vol. 3 No. 3, pp. A90.</p> <p>Reger-Nash, B., Simon, K., Cooper, L., & Bauman, A. (2003), WHEELING WALKS: a media-based intervention to increase walking, <i>Fourth International Conference on Walking</i>, Vol. 21, pp. 1-3.</p> |
| <p><i>Bike, Walk & Wheel</i></p> | <p>Sayers, S. P., LeMaster, J. W., Thomas, I. M., Petroski, G. F., & Ge, B. (2012), “Bike, walk, and wheel: a way of life in Columbia, Missouri, revisited”, <i>American Journal of Preventive Medicine</i>, Vol. 43 No. 5, pp. 379-383.</p> <p>Thomas, I. M., Sayers, S. P., Godon, J. L., & Reilly, S. R. (2009), “Bike, walk, and wheel: a way of life in</p> |

| | |
|---------------------------|---|
| | Columbia, Missouri”, <i>American Journal of Preventive Medicine</i> , Vol. 37 No. 6, pp. 322-328. |
| <i>Mothers for Health</i> | Keller, C., Vega-Lopez, S. Ainsworth, B., Nagle-Williams, A., Records, K., Permana, P., & Coonrod, D. (2014), “Social marketing: approach to cultural and contextual relevance in a community-based physical activity intervention”, <i>Health Promotion International</i> , Vol. 29 No. 1, pp. 1-11. |
| <i>Activate Omaha</i> | Huberty, J. L., Dodge, T., Peterson, K., & Balluff, M. (2009). “Activate Omaha: the journey to an active living environment”, <i>American Journal of Preventive Medicine</i> , Vol. 37 No. 6 Suppl 2, pp. 428-435. |
| <i>Active Seattle</i> | Deehr, R. C., & Shumann, A. (2009), “Active Seattle Achieving Walkability in Diverse Neighborhoods”, <i>American Journal of Preventive Medicine</i> , Vol. 37 No. 6, pp. 403-411. |
| <i>Canada on the Move</i> | <p>Craig, C. L., Tudor-Locke, C., & Bauman, A. (2007), “Twelve-month effects of Canada on the Move: a population-wide campaign to promote pedometer use and walking”, <i>Health Education Research</i>, Vol. 22 No. 3, pp. 406-413.</p> <p>Cameron, R., Bauman, A., & Rose, A. (2006), “Innovations in Population Intervention Research Capacity: The Contributions of” Canada on the Move””, <i>Canadian Journal of Public Health/Revue Canadienne de Sante'e Publique</i>, Vol. 97 No. Suppl 1, pp. S5-S9.</p> <p>Craig, C. L., Cragg, S. E., Tudor-Locke, C., & Bauman, A. (2006), “Proximal impact of Canada on the Move - The relationship of campaign awareness to pedometer ownership and use”, <i>Canadian Journal of Public Health- Revue Canadienne De Sante Publique</i>, Vol. 97, pp. S21-S27.</p> <p>Faulkner, G., & Finlay, S.-J. (2006), “Canada on the move: An intensive media analysis from inception to reception”, <i>Canadian Journal of Public Health/Revue Canadienne de Sante'e Publique</i>, Vol. 97 No. Suppl 1, pp. S16-S20.</p> <p>Plotnikoff, R. C., Spence, J. C., Tavares, L. S., Rovniak, L. S., Bauman, A., Lear, S. A., & McCargar, L. (2006), “Characteristics of Participants Visiting the” Canada on the Move” Website”, <i>Canadian Journal of Public Health/Revue Canadienne de Sante'e Publique</i>, Vol. 97 No. Suppl 1, pp. S28-S35.</p> <p>Spence, J. C., Plotnikoff, R. C., Rovniak, L. S., Ginis, K. A. M., Rodgers, W., & Lear, S. A. (2006), “Perceived Neighbourhood Correlates of Walking Among Participants Visiting the” Canada on the Move” Website”,</p> |

| | |
|---------------------------|---|
| | <p><i>Canadian Journal of Public Health/Revue Canadienne de Sante'e Publique</i>, Vol. 97 No. Suppl 1, pp. S36-S40.</p> <p>Tudor-Locke, C., Sisson, S. B., Lee, S. M., Craig, C. L., Plotnikoff, R. C., & Bauman, A. (2006), "Evaluation of quality of commercial pedometers", <i>Canadian Journal of Public Health/Revue Canadienne de Sante'e Publique</i>, Vol. 97 No. Suppl 1, pp. S10-S15.</p> |
| <i>GO Men's Health</i> | <p>Burton, A., Atherton, M., & Nygaard, A. (2009), "GO Men's Health Program", <i>Social Marketing Quarterly</i>, Vol. 15 No. 2, pp. 39.</p> <p>Coles, R., Watkins, F., Swami, V., Jones, S., Woolf, S., & Stanistreet, D. (2010), "What men really want: A qualitative investigation of men's health needs from the Halton and St Helens Primary Care Trust men's health promotion project", <i>British journal of health psychology</i>, Vol. 15 No. 4, pp. 921-939.</p> <p>McAteer, S., Bayliss, J., & Forbes, G. Halton & St Helens (2008) Cancer Health Equity Audit.</p> |
| <i>PATH trial</i> | <p>Wilson, D. K., Trumpeter, N. N., St. George, S. M., Coulon, S. M., Griffin, S., Lee Van Horn, M., Gadson, B. (2010), "An overview of the "Positive Action for Today's Health" (PATH) trial for increasing walking in low income, ethnic minority communities", <i>Contemporary Clinical Trials</i>. Vol. 31 No. 6, pp. 624-633.</p> <p>Wilson, D. K., Ellerbe, C., Lawson, A. B., Alia, K. A., Meyers, D. C., Coulon, S. M., & Lawman, H. G. (2013) "Imputational modeling of spatial context and social environmental predictors of walking in an underserved community: The PATH trial", <i>Spatial and Spatio-temporal Epidemiology</i>, Vol. 4 No. 0, pp. 15-23.</p> <p>Coulon, S. M., Wilson, D. K., Griffin, S., M, Alia, K. A., Trumpeter, N. N., Gadson, B. (2012), "Formative Process Evaluation for Implementing a Social Marketing Intervention to Increase Walking Among African Americans in the Positive Action for Today's Health Trial", <i>American Journal of Public Health</i>, Vol. 102 No. 12, pp. 2315-2321.</p> <p>Wilson, D. K., St George, S. M., Trumpeter, N. N., Coulon, S. M., Griffin, S. F., Wandersman, A., Brown, P. V. (2013), "Qualitative developmental research among low income African American adults to inform a social marketing campaign for walking", <i>International Journal of Behavioral Nutrition and Physical Activity</i>, Vol. 10, pp. 33.</p> |
| <i>Step up. Step out!</i> | <p>Sharpe, P. A., Burroughs, E. L., Granner, M. L., Wilcox, S., Hutto, B. E., Bryant, C. A., Pekuri, L. (2010), "Impact of a community-based prevention marketing intervention to promote physical activity among middle-</p> |

| | |
|--|--|
| | <p>aged women”, <i>Health Education & Behavior</i>, Vol. 37, No. 3, pp. 403-423.</p> <p>Burroughs, E., Peck, L. E., Sharpe, P. A., Granner, M. L., Bryant, C. A., & Fields, R. (2005), “Using focus groups in the consumer research phase of a social marketing program to promote moderate-intensity physical activity and walking trail use in Sumter County, South Carolina”, <i>Preventing Chronic Disease</i>, Vol. 3 No. 1, pp. A08.</p> <p>Peck, L. E., Sharpe, P. A., Burroughs, E. L., & Granner, M. L. (2008), “Recruitment Strategies and Costs for a Community-Based Physical Activity Program”, <i>Health Promotion Practice</i>, Vol. 9 No. 2, pp. 191-198.</p> |
| <p><i>10,000 Steps Rockhampton</i></p> | <p>Brown, W. J., Mummery, K., Eakin, E., & Schofield, G. (2006), “10,000 Steps Rockhampton: Evaluation of a Whole Community Approach to Improving Population Levels of Physical Activity”, <i>Journal of Physical Activity & Health</i>, Vol. 3 No. 1, pp. 1-14.</p> <p>Brown, W. J., Eakin, E., Mummery, K., & Trost, S. G. (2003), “10,000 Steps Rockhampton: establishing a multi-strategy physical activity promotion project in a community”, <i>Health Promotion Journal of Australia</i>, Vol. 14 No. 2, pp. 95-100.</p> <p>Burton, N. W., Walsh, A., & Brown, W. J. (2008), “It just doesn't speak to me: mid-aged men's reactions to '10,000 Steps a Day'”, <i>Health Promotion Journal of Australia</i>, Vol. 19 No. 1, pp. 52-59.</p> <p>Eakin, E. G., Brown, W. J., Marshall, A. L., Mummery, K., & Larsen, E. (2004), “Physical activity promotion in primary care: bridging the gap between research and practice”, <i>American Journal of Preventive Medicine</i>, Vol. 27 No. 4, pp. 297-303.</p> <p>Eakin, E. G., Mummery, K., Reeves, M. M., Lawler, S. P., Schofield, G., Marshall, A. J., & Brown, W. J. (2007), “Correlates of pedometer use: Results from a community-based physical activity intervention trial (10,000 Steps Rockhampton)”, <i>International Journal of Behavioral Nutrition and Physical Activity</i>, Vol. 4 No. 1, pp. 31.</p> <p>Mummery, W. K., & Brown, W. (2009) “Whole of community physical activity interventions: easier said than done”, <i>British Journal of Sports Medicine</i>, Vol. 43 No. 1, pp. 39-43.</p> <p>Mummery, K., Brown, W., Schofield, G., Caperchione, C., Austin, G., & Steele, R. (2004), “Multi-strategy approaches to the promotion of health-related physical activity at the community level: Examples from 10,000 Steps Rockhampton”, <i>Journal of Science and Medicine in Sport</i>, Vol. 7 No. 4, pp. 43.</p> <p>Mummery, W. K., Schofield, G., Hinchliffe, A., Joyner, K., & Brown, W. (2006), “Dissemination of a community-based physical activity project: the case of 10,000 steps”, <i>Journal of Science and Medicine in Sport</i>,</p> |

| | |
|---------------------------------------|---|
| | <p>Vol. 9 No. 5, pp. 424-430.</p> <p>Schofield, G., Steele, R., Mummery, K., Brown, W. (2004), “Engaging a local council to promote physical activity: the case of dog walking in the 10,000 Steps Rockhampton project”, <i>Health Promotion Journal of Australia</i>, Vol. 15 No. 1, pp. 78-81.</p> <p>Schofield, G., Steele, R., Mummery, K., Brown, W., Trost, S., & Eakin, E. (2003), “Health Promotion for Dogs and Humans: The 10,000 Steps Rockhampton Dog walking Intervention: Tackling the Barriers to Participation and Performance”. <i>Australian Conference of Science and Medicine in Sport</i>, 2003.</p> |
| <i>Cycling Connecting Communities</i> | <p>Rissel, C., Merom, D., Bauman, A., Garrard, J., Wen, L. M., & New, C. (2010), “Current Cycling, Bicycle Path Use, and Willingness to Cycle More-Findings From a Community Survey of Cycling in Southwest Sydney, Australia”, <i>Journal of Physical Activity & Health</i>, Vol. 7 No. 2, pp. 267-272.</p> <p>Rissel, C. E., New, C., Wen, L. M., Merom, D., Bauman, A. E., & Garrard, J. (2010), “The effectiveness of community-based cycling promotion: findings from the Cycling Connecting Communities project in Sydney, Australia”, <i>International Journal of Behavioral Nutrition and Physical Activity</i>, Vol. 7 No. 1, pp. 8.</p> |
| <i>Move More Diabetes</i> | <p>Foundation, R. W. J. (2007) “The Diabetes Initiative of the Robert Wood Johnson Foundation”, available at: http://www.diabetesinitiative.org/ (accessed 13 April 2016)</p> <p>Richert, M. L., Webb, A. J., Morse, N. A., O’Toole, M. L., & Brownson, C. A. (2007), “Move More Diabetes: using lay health educators to support physical activity in a community-based chronic disease self-management program”, <i>Diabetes Educator</i>, Vol. 33, pp. 179S-184.</p> |
| <i>Get Active Orlando</i> | <p>McCreedy, M., & Leslie, J. G. (2009), “Get Active Orlando: Changing the Built Environment to Increase Physical Activity”, <i>American Journal of Preventive Medicine</i>, Vol. 37 No. 6, Supplement 2, pp. S395-S402.</p> |
| <i>National Park Service</i> | <p>Hoehner, C. M., Brownson, R. C., Allen, D., Gramann, J., Behrens, T. K., Floyd, M. F., Yount, B. W. (2010), “Parks Promoting Physical Activity: Synthesis of Findings From Interventions in Seven National Parks”, <i>Journal of Physical Activity & Health</i>, Vol. 7, pp. 67-81.</p> |
| <i>Find Thirty every day</i> | <p>Leavy, J., Rosenberg, M., Barnes, R., Bauman, A., & Bull, F. (2013), “Would you Find Thirty online? Website use in a Western Australian physical activity campaign”, <i>Health Promotion Journal of Australia</i>, Vol. 24 No. 2,</p> |

| | |
|---|--|
| | <p>pp. 118-125.</p> <p>Leavy, J. E., Rosenberg, M., Bauman, A. E., Bull, F. C., Giles-Corti, B., Shilton, T., . . . Barnes, R. (2013), “Effects of Find Thirty every day® Cross-Sectional Findings From a Western Australian Population-Wide Mass Media Campaign, 2008-2010”, <i>Health Education & Behavior</i>, Vol. 40 No. 4, pp. 480-492.</p> <p>Leavy, J. E., Rosenberg, M., Bull, F. C., & Bauman, A. E. (2014), “Who do we reach? Campaign evaluation of Find Thirty every day® using awareness profiles in a Western Australian cohort”, <i>Journal of Health Communication</i>(ahead-of-print), pp. 1-17.</p> <p>Maitland, C., Rosenburg, M., Shilton, T., Bauman, A., Giles-Corti, B., Henley, N., .Barnes, R. (2010), “Impact of the 2008 statewide physical activity campaign on Western Australian adults—Initial findings from Find Thirty every day”, <i>Journal of Science and Medicine in Sport</i>, Vol. 12, pp. e27.</p> |
| <p><i>Healthy Hawaii Initiative</i></p> | <p>Buchthal, O. V., Doff, A. L., Hsu, L. A., Silbanuz, A., Heinrich, K. M., & Maddock, J. E. (2011), “Avoiding a Knowledge Gap in a Multiethnic Statewide Social Marketing Campaign: Is Cultural Tailoring Sufficient?”, <i>Journal of Health Communication</i>, Vol. 16 No. 3, pp. 314-327.</p> <p>Heinrich, K. M., Aki, N. N., Hansen-Smith, H., Fenton, M., & Maddock, J. (2011), “A comprehensive multi-level approach for passing safe routes to school and complete streets policies in Hawaii”, <i>Journal of physical activity and health</i>, Vol. 8 No. 1, pp. S135.</p> <p>Maddock, J. E., Marshall, C., Nigg, C. R., & Barnett, J. D. (2003), “Development and first year results of a psychosocial surveillance system for chronic disease related health behaviors”, <i>Californian Journal of Health Promotion</i>, Vol. 1 No. 5, pp. 54-64.</p> <p>Maddock, J. E., Silbanuz, A., & Reger-Nash, B. (2008), “Formative research to develop a mass media campaign to increase physical activity and nutrition in a multiethnic state”, <i>Journal of Health Communication</i>, Vol. 13 No. 3, pp. 208-215.</p> <p>Maddock, J., Takeuchi, L., Nett, B., Tanaka, C., Irvin, L., Matsuoka, C., & Wood, B. (2006), “Evaluation of a statewide program to reduce chronic disease: The Healthy Hawaii Initiative, 2000–2004”, <i>Evaluation and Program Planning</i>, Vol. 29 No. 3, pp. 293-300.</p> |
| <p><i>Get Up and Do Something</i></p> | <p>Peterson, M., Abraham, A., & Waterfield, A. (2005), “Marketing physical activity: lessons learned from a statewide media campaign”, <i>Health Promotion Practice</i>, Vol. 6 No. 4, pp. 437-446.</p> |

| | |
|------------------------------|---|
| | <p>Peterson, M., Chandlee, M., & Abraham, A. (2008), “Cost-effectiveness analysis of a statewide media campaign to promote adolescent physical activity”, <i>Health Promotion Practice</i>, Vol. 9 No. 4, pp. 426-433.</p> |
| <p><i>ParticipACTION</i></p> | <p>Bauman, A., Cavill, N., & Brawley, L. (2009), “ParticipACTION: the future challenges for physical activity promotion in Canada”, <i>International Journal of Behavioral Nutrition and Physical Activity</i>, Vol. 6, pp. 8-11.</p> <p>Bauman, A., Madill, J., Craig, C. L., & Salmon, A. (2004). “ParticipACTION: This Mouse Roared, But Did It Get the Cheese?”, <i>Canadian Journal of Public Health</i>, Vol. 95, pp. S14-19.</p> <p>Costas-Bradstreet, C. (2004), “Spreading the Message Through Community Mobilization, Education and Leadership: A Magnanimous Task”, <i>Canadian Journal of Public Health</i>, Vol. 95, pp. 25-29.</p> <p>Costas-Bradstreet, C., & Edwards, P. (2004), “ParticipACTION... the mouse that roared: A marketing and health communications success story”, <i>Canadian Journal of Public Health</i>, Vol. 95 No. Supplement 2, pp. 1-44.</p> <p>Craig, C. L., Bauman, A., & Reger-Nash, B. (2010), “Testing the hierarchy of effects model: ParticipACTION's serial mass communication campaigns on physical activity in Canada”, <i>Health Promotion International</i>, Vol. 25 No. 1, pp. 14-23.</p> <p>Edwards, P. (2004). “No Country Mouse: Thirty Years of Effective Marketing and Health Communications”, <i>Canadian Journal of Public Health</i>, Vol. 95 No. Suppl 2, pp. 6-13, 43-44.</p> <p>Gainforth, H. L., Jarvis, J. W., Berry, T., Chulak-Bozzer, T., Deshpande, S., Faulkner, G., . . . Latimer-Cheung, A. E. (2004), “Assessing The Effectiveness Of A Social Marketing Campaign Drawing Parents' Attention To Their Child's Physical Activity”, <i>Annals of Behavioral Medicine</i>, Vol. 47, pp. S218-S218.</p> <p>Jarvis, J. W., Rhodes, R. E., Deshpande, S., Berry, T. R., Chulak-Bozzer, T., Faulkner, G., . . . Latimer-Cheung, A. E. (2004), “Investigating the Role of Brand Equity in Predicting the Relationship Between Message Exposure and Parental Support for Their Child's Physical Activity”, <i>Social Marketing Quarterly</i>, Vol. 20 No. 2, pp. 103.</p> <p>Lagarde, F. (2004), “The Mouse Under the Microscope: Keys to ParticipACTION's Success”, <i>Canadian Journal of Public Health</i>, Vol. 95, pp. 20-24.</p> <p>Lagarde, F. (2004), “The Challenge of Bilingualism: ParticipACTION Campaigns Succeeded in Two Languages”, <i>Canadian Journal of Public Health</i>, Vol. 95, pp. S30-32.</p> <p>Plotnikoff, R. C., Todosijczuk, I., Faulkner, G., Pickering, M. A., Cragg, S., Chad, K., ... & Brawley, L. (2009), “ParticipACTION: Baseline assessment of the 'new ParticipACTION': A quantitative survey of Canadian</p> |

| | |
|-----------------------------------|--|
| | <p>organizational awareness and capacity”, <i>International Journal of Behavioral Nutrition and Physical Activity</i>, Vol. 6 No. 1, pp. 86.</p> <p>Rootman, I., & Edwards, P. (2004), “The Best Laid Schemes of Mice and Men... ParticipACTION's Legacy and the Future of Physical Activity Promotion in Canada”, <i>Canadian Journal of Public Health</i>, Vol. 95, pp. 37-42.</p> <p>Tremblay, M.S, & Craig, C.L. (2009), “ParticipACTION: Overview and introduction of baseline research on the "new" ParticipACTION”, <i>International Journal of Behavioral Nutrition and Physical Activity</i>, Vol. 6 No. 1, pp. 84.</p> |
| <i>Slavic Village Development</i> | <p>Miller, E. K., & Scofield, J. L. (2009), “Slavic Village: incorporating active living into community development through partnerships”, <i>American Journal of Preventive Medicine</i>, Vol. 37 No. 6, pp. S377-S385.</p> |
| <i>Salsa y Salud</i> | <p>Henao, J. C., Rodriguez, J., & Wilbum, S. T. (2006), “Salsa y Salud: Increasing Healthy Lifestyle Awareness through a Radio-based Initiative”, <i>Journal of Nutrition Education & Behavior</i>, Vol. 38 No. 4, pp. 267-268.</p> |

