Social marketing interventions to promote physical activity among 60 years and older: a systematic review of the literature

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Abstract

Background: Falls are a significant source of morbidity in people aged 65 and over, affecting one in three people in this age group. The scientific evidence indicates that physical activity is the most effective method for preventing falls among seniors. Although public health professionals often use social marketing is to design and plan successful interventions, its use to promote physical activity and prevent falls among older people remains low. This article aims to provide a new systematic literature review of social marketing interventions promoting physical activity and targeting people aged 60 and over. Methods: Following PRISMA guidelines, we searched for relevant articles in five primary databases using predefined search and inclusion criteria. Two independent coders analysed the selected articles to identify evidence of the seven social marketing benchmark criteria, defined by experts in the field as the common elements that contribute to social marketing success. Results: The final review included twenty articles covering six interventions. Of the studies selected, two specifically targeted over 60-year-olds, whereas the others segmented the population into several age-based subcategories, including over 60-year-olds. Five interventions highlighted positive results for the participants with an increase in participation or an increase in physical activity level. None of the six interventions selected for this literature review implemented the entire social marketing approach. Conclusion: Few published interventions mobilise the seven social marketing criteria. Further research is required to encourage uptake and inclusion in successful social marketing interventions to increase program effectiveness in this target population.

Background

Population ageing is the result of a falling birth rate and a rising life expectancy. Between
2015 and 2050, global projections show that the proportion of over, the 60-year-olds in the world population should rise from 12 to 22%, representing nearly 2 billion people (1). Although increasing our life expectancy is vital for humanity, so too is preserving functional autonomy to maintain a certain quality of life and manage health resources (2). Falls are a significant source of morbidity in people aged 65 and over, affecting one in three people in this age group (3). A recent systematic review and meta-analysis examined the association of physical activity and the risk of falling for older adults. It concluded that the risk of being a recurrent faller (two or more self-reported falls over the follow-up period of 12-36 months) was 39% higher in those older adults with the lowest levels of physical activity (4). Each year in the USA, the cost of non-fatal fall injuries among adults age 65 and over is about $50 billion. The cost of fatal falls is about $754 million (5).

Physical activity (PA) represents the most effective method for preventing falls among older people (3,6,7), while PA interventions focusing on balance are the most effective way of avoiding loss of autonomy among older people living at home (3,8). There is evidence that these balance-based programs can be cost-effective (9). These programs produce excellent results for the health of the older people and improve, in particular, the remaining life of the participants (3,9,10).

However, though there is now agreement that PA is useful in practice, there are many barriers to participation (11,12). Indeed, several such barriers exist among the elderly, such as a belief of no longer being able to participate because of a loss of physical capacity, an image of sports as being for young, healthy people, and poor awareness of the tailored activities on offer (11–13). That is maybe why, all in all, only a small number of seniors participate in PA for fall prevention (14,15).

Social marketing is one of the most widely used methods for promoting behaviours that
benefit the health of the population (12, 13). Social marketing is "the adaptation of commercial marketing technologies to programs designed to influence the voluntary behavior of target audiences to improve their personal welfare and that of the society" (17). Social marketing proposes to appropriate the principles and marketing techniques mobilized in particular by companies to set up more effective prevention programs (16). Seven criteria guide the social marketing method: the aim of the intervention, analysis of the target audience, segmentation of the target audience, exchange, marketing mix, competition, and evaluation (18–20).

Successful health interventions based on social marketing principles have been achieved in domains such as smoking prevention, obesity prevention, as well as in the reduction of the use of alcohol have (13–15). Moreover, these social marketing initiatives have achieved success in different age groups, including adolescents (21), adults (22), and older people (23).

Although this method has shown its value in other contexts or groups of age, its use in getting seniors to take part in regular PA remains limited (24). Given the increased use of social marketing to promote physical activity (25), we aimed to provide a new systematic literature review of social marketing interventions to support PA among over 60-year-olds.

**Methods**

**Literature search sources and strategies**

Following PRISMA guidelines to conduct the review (26), we analysed social marketing interventions that aimed to increase PA among over 60-year-olds in French or English in peer-reviewed journals published between January 2008 and July 2019. We executed the search using five databases with extensive coverage of the public health literature: Web of Science, PubMed, EBSCOhost, ScienceDirect, and BASE. Table 1 reports the search strategies and keywords used for each of the databases along with the number of articles
All potentially relevant articles and records were imported into Zotero 5.0.73 citation management software. Articles were considered for inclusion if they proposed and evaluated a social marketing intervention aiming to increase physical activity level among people aged 60 and over. The search focused on articles written in English or French. The exclusion criteria were: 1) papers that did not use the social marketing approach; 2) interventions aimed at children and adults under 60; 3) interventions that did not target PA; 4) articles published in languages other than English or French.

A total of 14 articles were selected. We conducted backwards and forward research of citations using the authors' names and intervention names and identified six more relevant articles, bringing the total to 20 articles for the final review (see Figure 1 for the literature search process and the list of the articles in Table 2 of the Appendix).

**Data extraction and analysis**

Analysis of the selected articles focused on identifying evidence of the seven social marketing benchmark criteria defined by researchers in the field (18,19,27,28).

Specifically:

- **Behavioural objective**: Behavioural change was the primary objective of the intervention (*i.e.*, increase PA);

- **Formative research**: Qualitative or quantitative studies were conducted on the target audiences to understand their characteristics, habits, and needs better;

- **Segmentation**: The target audience was segmented based on common characteristics (*e.g.*, sex, social background) and the interventions tailored to specific segments;

- **Exchange**: Consider what the audience values and the price they paid; attends to the perceived/actual benefits and perceived/actual costs of engaging in the focal behaviour, taking part in more PA;
- Marketing mix: The intervention uses elements of the marketing mix (the 4Ps: product, price, place, promotion) to achieve the objectives of promoting PA. Employs tools such as Influencers (e.g., work with partners on the ground like associations, companies), Behaviour (recommend and facilitate the adoption of the behaviour), Cost (offer financial support mechanisms to combat financial or psychological barriers to adopting the behaviour), Ease of Access (facilitate access to services or products that enable a change in the target behaviour), and Communication (promote the behaviour through the use of communication tools) (16);

- Competition: A competitor analysis was performed (and factored into the program) to identify any issues that could hinder the adoption of the proposed effort to increase PA, for example, the existence of other organisations or competing programs;

- Evaluation: An assessment of the program.

Results

Of the six interventions selected, five (29–33) had a positive effect on participants, increasing participation in the activities offered or increasing the level of PA. One study did not assess the outcomes (34).

Of the studies selected, two specifically targeted over 60-year-olds (29,31), whereas the others segmented the population into subcategories, one of which was over 60-year-olds.

**Behavioural objective:** The five interventions that had a positive effect on PA developed programs specified specific goals to change people’s actual behaviour. Specifically, Carolyn DiGuiseppi et al. (2014) aimed to increase the attractiveness of balance classes (physical activity) for over 60-year-olds in selected churches. Dawn Wilson et al. (2015) aimed to improve the walking level of low-income African-American communities in the study area. Janet Withall et al. (2012) conducted a study that aimed to increase recruitment and adherence in a PA program in a low-income neighbourhood. Masamitsu
Kamada et al. (2018) aimed to increase the proportion of people aged 40 to 79 participating in aerobic, flexibility, and muscle-strengthening activities in the city of Unnan, Japan. Lastly, Vijay Varma et al. (2016) aimed to increase walking levels among over 60-year-olds recruited as volunteers into public schools in the US city of Baltimore.

**Formative research:** Formative research is crucial in a social marketing intervention (20) because it allows the social marketer to understand the target audience and the targeted behaviour better. Each of the five interventions conducted interview-based market studies to identify the barriers and facilitators of the target behaviour. Withall et al. (2012) employed a mixed-method, using a questionnaire to assess people’s motivation to take part in group PA along with group interviews.

**Segmentation:** Of the five interventions that had a positive effect, one reported the use of segmentation. In the study by Kamada et al. (2018), the researchers used a model to determine a primary target segment for communications: women aged 60 to 79 years. They chose to emphasise three points: the total number of persons in the segment, the risk status, and the persuasibility of the segment.

**Exchange:** The five interventions implemented the exchange concept by using incentives. In the study by DiGuiseppi et al. (2014), participants received $5 if they took part in the classes on offer. The church leaders facilitated the transmission of messages and communications to the study's target audience. Withall et al. (2012) offered the first six weeks of sessions free of charge in their intervention, after which the price rose to £1 per session. A low price was used to attract low-income individuals to the meetings. In the study by Wilson et al. (2015), participants received a $20 gift card for each assessment period. Lastly, in the study by Varma et al. (2016), participants received financial compensation for the time they volunteered as well as $25 for taking part in an assessment and $10 for a telephone interview.
Marketing mix: The five interventions used the marketing mix principles to set up their program. For example, in the intervention by DiGuiseppi et al. (2014), the "product" was a fall prevention class, while the communication involved distributing flyers or newsletters promoting these classes. They selected churches as their location to facilitate access to the target audience, and the cost of the classes was $20. Price is one of the psychological barriers to taking part in PA. However, perceived costs include more than just the admission fee and also involve the number of sessions, their frequency, and the distance from home, not to mention the fear of falling or aggravating existing pain. Mindful of this, DiGuiseppi et al. reduced these barriers, offering classes in a safe, comfortable environment, and providing a schedule that suited the participants' availability and preferences.

Competition: The intervention by DiGuiseppi et al. (2014) was the only one that identified a facility that competed with their program. That facility was a wellness centre offering exercise programs for over 60-year-olds.

Evaluation: of the interventions that had a positive impact on changing PA habits, that of Wilson et al. (2015) assessed participation data and psychosocial data from participants at baseline as well as at 12, 18, and 24 months after the intervention. They revealed that uptake was higher among PATH trial participants who received information on the PA program. Walking attendance was higher among these participants than among those who received no information. Over nine months, the number of walkers rose from 40 to 400 per month in the social marketing intervention group (32).

Withall et al. (2012) showed that enrollment in the different PA classes (dance, gym, and balance sessions) had increased since the start of the program, that attendance levels were steady, and that adherence was good.

Varma et al. (2016) reported an increase in walking among women in the social marketing
intervention group, with their daily step counts rising by a mean of 1500.

Kamada et al. (2018) showed that their intervention increased the level of each type of PA promoted in their target population. That was a 5-year study, with the first positive results having appeared progressively over several years.

DiGuiseppi et al. (2014) aimed to assess class participation and information retention by participants. Their intervention showed that the program implemented in the churches succeeded in motivating seniors to join PA classes. The participants were also more likely to remember information about fall prevention.

Table 3 shows an assessment of the use of the seven social marketing benchmark criteria as defined by researchers in social marketing. None of the six interventions selected for this literature review implemented the entire social marketing approach. In other words, none met all of the seven criteria presented above. Two of the six interventions employed six of the criteria (30,35), three interventions used five (31,33,36), and one employed three (34).

Discussion And Conclusion

This article provided a systematic literature review of social marketing interventions to promote PA among over 60-year-olds. We found very few published studies on this topic; only fourteen papers representing six interventions emerged from our search of five scientific databases. Of the six interventions, five concluded that social marketing was useful for promoting PA among the elderly.

The five studies that reported a positive assessment of their programs believed their success to be mainly due to three factors. First, the implementation of social marketing criteria connected to the specific social marketing techniques used. A better understanding of core marketing concepts supports better planning, implementation, and effectiveness. Second, the funding of the activities, which made it possible to tackle
financial barriers. Third, the building of social ties between participants in the programs, which provided them with support and interaction. For instance, Varma et al. (2016) suggest that walking levels increased among women because they were taking part in a new voluntary activity. Kamada et al. (2013, 2015) state that their studies did not succeed in demonstrating an increase in PA levels at 1 and 3 years because the program's approach was not comprehensive enough. For that reason, they suggested that a strategy of modifying the environment by improving the public transport system and building facilities specifically for PA could facilitate the meeting of recommended PA levels. Five years after the launch of the study, Kamada et al. (2018) showed that their intervention had had a positive effect. The study by Newton et al. (2015) has not yet been analysed.

The interventions identified in our systematic review all used the marketing mix and its "4Ps": Price, Place, Promotion, and Product. The 4Ps represent a group of operational areas for developing strategies and tactics. However, there is some debate regarding the suitability of the 4Ps for non-commercial marketing purposes. For instance, Gallopel-Morvan et al. (19) advance five criteria they deem more suited to social marketing and behavioural change: Influencers, Behaviour, Cost, Ease of Access, and Communication. Notably, social marketers have a range of marketing tools at their disposal and use them in interventions.

The segmentation variables reported in the PA studies focused on basic descriptors of demographics (who?) and geography (where?). Although tried and tested, a narrow focus on markers as sex and gender can limit the kinds of insight required to develop an effective marketing strategy (37). For instance, psychographic segmentation addresses the motivational concerns of target consumers and is widely used to develop user personas and profiles. Research on consumer personality traits, values, attitudes, interests, and lifestyles can identify what motivates targeted behaviours, and such
insights have informed interventions that target segments of young adults who use tobacco (38,39), such as Lisha et al.’s (39) study that identified distinct tobacco use risk patterns across different groups of young adults (Hipster, Country, Hip Hop, Partier, Homebody, and Young Professional). Research on the mindsets of older people and their views on physical activity are both lacking and needed.

Furthermore, implementing segmentation schemes that place a greater emphasis on actual consumer behaviour holds great potential (20). Marketing involves exchanges, and consumers make decisions not only about what they "get" (e.g., products or services) but also about what they "give up" (e.g., allocation of time, effort, money, comfort, autonomy, privacy, social reputation). Social marketers ought to pay close attention to the nuances of behaviour and heed segment-level differences in benefits sought and willingness to pay (40), purchase and use occasions (41) or even patterns of social media sharing (42). Used together, psychographic and behavioural segmentation can help to better understand and target messages for high-risk subgroups (39) and inform the development of targeted messages that echo a target audience's existing views and practices, and therefore, produce more powerful persuasive effects (43).

Future research might consider looking at the dynamics of influence within the social networks of older people, given that exercise is often initiated and enacted with other people. A networked view of consumption can yield innovative intervention strategies. For example, consider the people implicated in mothers' breastfeeding decisions (44). Breastfeeding initiation and cessation decisions are shaped by varied aspects of the mother-infant relationship, guided by different healthcare professionals, muddled by mother-other child duties, enabled by spousal or caregiver support, and impacted by the (re)actions of other people in the workplace and public sphere. In a similar vein, research has leveraged insights about peer crowd affiliation to promote smoking cessation (45). A
consumption ensemble approach (46) could inform and inspire the development of sociologically-based intervention strategies.

The measurement of “daily step counts” by Varma and al. (2016) is an excellent example of how technology (wearable devices) can generate performance feedback to both motivate participants and to assess the success of interventions. Applications of wearable technologies in healthcare had recently gained considerable interest from researchers and industry alike. Similarly, the retailing and services marketing literature increasingly look to self-service technologies as ways to improve service experiences while achieving operational efficiencies.

It is difficult to say whether social marketing is useful in promoting PA among seniors since none of the six interventions selected used the entire approach (i.e., all seven benchmark criteria). Haruka Fujihira et al. (24) showed that the more a program uses the social marketing benchmark criteria defined by A.R. Andreasen, the more it becomes effective at changing the behavioural habits of target audiences. Literature reviews such as those by Julia Carins and Sharyn Rundle-Thiele (47), Bo Pang et al. (48), and Martine Stead et al. (49) have classified social marketing interventions according to the same benchmark criteria as Andreasen. They have reported similar findings to those of Fujihira (2015).

Our literature review is based on the classic and widely-cited social marketing benchmark criteria defined by A.R. Andreasen (20). Other researchers, however, have expanded the theory. Observers have noted that many social marketing programs are poorly assessed or are not evaluated at all (42). Accordingly, Gallopol-Morvan et al. (19) add a seventh criterion, evaluation, as a fundamental step in the process of a campaign using social marketing theory (19). Among other things, program evaluation can provide valuable information about program design and implementation, and whether or not the program
succeeded in changing the targeted behaviour (51).

Still, to improve the effectiveness of prevention campaigns using social marketing, other researchers adopt the eight criteria recommended by the UK National Social Marketing Centre (44, 45). Among the additional criteria, one relates to the use of behavioural theory in social marketing intervention. Thus, recent work shows that when the theory of behaviour change is integrated into the construction of interventions, additional positive effects of the changes are noted (48,53). It is in this sense that the work of Sharyn Rundle-Thiele et al. (54) also goes, explaining that current research focuses on the explanation of individual behaviours and not on behaviour change. Moreover, the authors proposed ten social marketing theory development goals to “assist social marketers to develop new ways of thinking that will deliver the theory and evidence base needed to outline what practitioners and policymakers should do to effect change” (54). The social marketing method is a young discipline. Today, several theories are in development. The most recent theories state that social marketing criteria should no longer be used as a simple tick-box checklist, but as a set of interrelated concepts (52).

Additionally, the papers that we selected in this review comprise certain limitations in terms of the assessment method, group heterogeneity, and contamination risk. The assessment models chosen preclude any definite direct attribution of the positive results to any one part of the intervention or any combination of activities. In some studies, discrepancies between the intervention and control groups interfered with the assessment of change between them. Withall et al. (2012) suggested that the groups had differences (particularly in terms of age and ethnic origin), which prevented them from making direct comparisons during the assessment. Kamada et al. (2015) thought that the results of their study were contaminated because the control group may have been exposed to the social marketing campaign developed for the intervention group. This unintended exposure may
have been due to the geographical proximity of the groups and word-of-mouth. Moreover, the criteria selected for assessing the prevention programs were not always the same, making it difficult to compare the interventions, or were insufficient to measure effectiveness. For instance, in the study by Withall et al. (2012), the criteria only gauged PA program participation without measuring PA levels, PA intensity, or biological markers. Some limitations of this study are to be highlighted. First, there is a publication bias because negative studies were probably less likely to be published. Second, our systematic literature review excludes public health and community-based interventions, which perhaps use social marketing techniques.

Different age groups (children, adults, seniors) have specific characteristics and guidelines in terms of public health and necessitate that separate social marketing interventions be designed for each one. Given both the lack of studies on using social marketing principles to promote PA in seniors, there is a need to develop more social marketing intervention promoting physical activity and targeting older people (24). Demographic projections show that the population of over 60-olds may represent nearly 2 billion people between now and 2050 (1). Since PA has been identified as one of the effective interventions for healthy ageing (55) and since a large proportion of seniors are not active enough, targeted social marketing programs could help prevent numerous health problems associated with inactivity (24,56). As shown in this literature review, social marketing may have the potential to be useful for promoting PA among seniors.

However, the studies we identified are not amenable to meta-analysis due to the heterogeneity of theoretical backgrounds, diverse treatment interventions, and reliance on different measures (49). Further research and more studies are needed to advance our understanding of the vital link between physical activity and seniors' health. By integrating social marketing criteria into intervention programs, we can better identify the
drivers of intervention success and the impact of our efforts.

Declarations

Ethics approval and consent to participate

Not applicable

Consent for publication

Not applicable

Availability of data and materials

The datasets analysed for the current study are available from the corresponding author on reasonable request.

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Competing interests

The authors declare that they have no competing interests.

Authors’ contributions

LG collected the data, coded and analyzed, and interpreted the data. DH coded and analyzed the data. LG drafted the manuscript and helped complete the PRISMA checklist. NB, DH, MM, FR, KGM, and BB provided critical input and revisions. All authors agree with the manuscript’s results and conclusions. All authors read and approved the final manuscript.

Bibliography

1. World Health Organisation. Vieillissement et santé [Internet]. 2018. Available from: http://www.who.int/mediacentre/factsheets/fs404/fr/

2. Lau RS, Ohinmaa A, Johnson JA. Predicting the Future Burden of Diabetes in Alberta from 2008 to 2035. Canadian Journal of Diabetes. 2011;35(3):274–81.

3. Sherrington C, Fairhall NJ, Wallbank GK, Tiedemann A, Michaleff ZA, Howard K, et al. Exercise for preventing falls in older people living in the community. Cochrane Database of Systematic Reviews [Internet]. 2019;(1). Available from: https://www.cochranelibrary.com/cdsr/doi/10.1002/14651858.CD012424.pub2/full

4. Soares WJS, Lopes AD, Nogueira E, Candido V, de Moraes SA, Perracini MR. Physical Activity Level and Risk of Falling in Community-Dwelling Older Adults: Systematic Review and Meta-Analysis. J Aging Phys Act. 2018 Oct 25;1–10.

5. Florence CS, Bergen G, Atherly A, Burns E, Stevens J, Drake C. Medical Costs of Fatal and Nonfatal Falls in Older Adults. Journal of the American Geriatrics Society. 2018;66(4):693–8.

6. Grossman DC, Curry SJ, Owens DK, Barry MJ, Caughey AB, Davidson KW, et al.
Interventions to Prevent Falls in Community-Dwelling Older Adults: US Preventive Services Task Force Recommendation Statement. JAMA. 2018 Apr 24;319(16):1696-704.

7. Cunningham C, O’ Sullivan R, Caserotti P, Tully MA. Consequences of physical inactivity in older adults: A systematic review of reviews and meta-analyses. Scandinavian Journal of Medicine & Science in Sports [Internet]. 2020 Feb 4 [cited 2020 Feb 13];n/a(n/a). Available from: https://onlinelibrary.wiley.com/doi/abs/10.1111/sms.13616

8. Liu-Ambrose T, Davis JC, Best JR, Dian L, Madden K, Cook W, et al. Effect of a Home-Based Exercise Program on Subsequent Falls Among Community-Dwelling High-Risk Older Adults After a Fall: A Randomized Clinical Trial. JAMA. 2019 Jun 4;321(21):2092-100.

9. Farag I, Howard K, Ferreira ML, Sherrington C. Economic modelling of a public health programme for fall prevention. Age Ageing. 2015 May;44(3):409-14.

10. Carande-Kulis V, Stevens JA, Florence CS, Beattie BL, Arias I. A cost-benefit analysis of three older adult fall prevention interventions. J Safety Res. 2015 Feb;52:65-70.

11. Hughes SL, Williams B, Molina LC, Bayles C, Bryant LL, Harris JR, et al. Characteristics of Physical Activity Programs for Older Adults: Results of a Multisite Survey. Gerontologist. 2005 Oct 1;45(5):667-75.

12. Schutzer KA, Graves BS. Barriers and motivations to exercise in older adults. Prev Med. 2004 Nov;39(5):1056-61.

13. Yardley L, Bishop FL, Beyer N, Hauer K, Kempen GIJM, Piot-Ziegler C, et al. Older people’s views of falls-prevention interventions in six European countries. Gerontologist. 2006 Oct;46(5):650-60.

14. Bongue B, Hugues J, Achour É, Colvez A, Sass C. Mieux prévenir les chutes chez les...
personnes âgées. Soins Gerontologie. 2016;21(120):24-9.

15. Dargent-Molina P, Cassou B. prévention des chutes chez les personnes âgées de plus de 75 ans vivant à leur domicile : analyse des interventions efficaces et perspectives de santé publique. 2017; Available from: http://invs.santepubliquefrance.fr/beh/2017/16-17/2017_16-17_6.html

16. Gallopel-Morvan K. Marketing social et marketing social critique : quelle utilité pour la santé publique ? Les Tribunes de la santé. 2014;45(4):37.

17. Andreasen AR. Marketing social change. 1st ed. San Francisco: Jossey-Bass; 1995. xx, 348.

18. Hastings G, Domegan C. Social Marketing: Rebels with a Cause. Routledge; 2017. 900 p.

19. Gallopel-Morvan K. Le Marketing Social - de la Comprehension des Publics aux Changements de Comportement. Ehesp; 2019.

20. Andreasen AR. Marketing Social Marketing in the Social Change Marketplace. Journal of Public Policy & Marketing. 2002;21(1):3-13.

21. Aceves-Martins M, Llauradó E, Tarro L, Moreno-García CF, Trujillo Escobar TG, Solà R, et al. Effectiveness of social marketing strategies to reduce youth obesity in European school-based interventions: a systematic review and meta-analysis. Nutr Rev. 2016 May;74(5):337-51.

22. Kubacki K, Rundle-Thiele S, Pang B, Buyucek N. Minimizing alcohol harm: A systematic social marketing review (2000–2014). Journal of Business Research. 2015 Oct 1;68(10):2214–22.

23. Evers U, Jones SC, Iverson D, Caputi P. ‘Get Your Life Back’: process and impact evaluation of an asthma social marketing campaign targeting older adults. BMC Public Health. 2013 Aug 15;13(1):759.
24. Fujihira H, Kubacki K, Ronto R, Pang B, Rundle-Thiele S. Social Marketing Physical Activity Interventions Among Adults 60 Years and Older: A Systematic Review [Internet]. 2015. Available from: http://journals.sagepub.com/doi/pdf/10.1177/1524500415606671

25. Kubacki K, Ronto R, Lahtinen V, Pang B, Rundle-Thiele S, Pang B, et al. Social marketing interventions aiming to increase physical activity among adults: A systematic review. Health Education. 2017 Jan 3;117(1):69–89.

26. Liberati A, Altman DG, Tetzlaff J, Mulrow C, Gøtzsche PC, Ioannidis JPA, et al. The PRISMA statement for reporting systematic reviews and meta-analyses of studies that evaluate healthcare interventions: explanation and elaboration. BMJ. 2009 Jul 21;339:b2700.

27. French J, Gordon R. Strategic Social Marketing. Los Angeles: Sage; 2015. XVII, 429.

28. Lee NR, Kotler P. Social marketing. 5. ed. Los Angeles, Calif.: SAGE Publ; 2016. XV, 567 Seiten.

29. DiGuiseppi CG, Thoreson SR, Clark L, Goss CW, Marosits MJ, Currie DW, et al. Church-based social marketing to motivate older adults to take balance classes for fall prevention: cluster randomized controlled trial. Preventive medicine. 2014;67:75–81.

30. Kamada M, Kitayuguchi J, Abe T, Taguri M, Inoue S, Ishikawa Y, et al. Community-wide intervention and population-level physical activity: a 5-year cluster randomized trial. Int J Epidemiol. 2018 01;47(2):642–53.

31. Varma VR, Tan EJ, Gross AL, Harris G, Romani W, Fried LP, et al. Effect of Community Volunteering on Physical Activity: A Randomized Controlled Trial. Am J Prev Med. 2016 Jan;50(1):106–10.

32. Wilson DK, van Horn ML, Siceloff ER, Alia KA, St George SM, Lawman HG, et al. The Results of the ‘Positive Action for Today’s Health’ (PATH) Trial for Increasing Walking...
and Physical Activity in Underserved African-American Communities. Annals of behavioral medicine : a publication of the Society of Behavioral Medicine. 2015;49(3):398-410.

33. Withall J, Jago R, Fox KR. 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. BMC public health. 2012;12:836.

34. Newton JD, Klein R, Bauman A, Newton FJ, Mahal A, Gilbert K, et al. The MOVE study: a study protocol for a randomised controlled trial assessing interventions to maximise attendance at physical activity facilities. BMC public health. 2015;15:403.

35. DiGuiseppi CG, Thoreson SR, Clark L, Goss CW, Marosits MJ, Currie DW, et al. Church-based social marketing to motivate older adults to take balance classes for fall prevention: cluster randomized controlled trial. Preventive medicine. 2014;67:75-81.

36. Wilson DK, van Horn ML, Siceloff ER, Alia KA, St George SM, Lawman HG, et al. The Results of the ‘Positive Action for Today’s Health’ (PATH) Trial for Increasing Walking and Physical Activity in Underserved African-American Communities. Annals of behavioral medicine : a publication of the Society of Behavioral Medicine. 2015;49(3):398-410.

37. Yankelovich D, Meer D. Rediscovering market segmentation. Harv Bus Rev. 2006 Feb;84(2):122-31, 166.

38. Berg CJ, Haardörfer R, Getachew B, Johnston T, Foster B, Windle M. Fighting Fire With Fire: Using Industry Market Research to Identify Young Adults at Risk for Alternative Tobacco Product and Other Substance Use. Soc Mar Q. 2017 Dec;23(4):302-19.

39. Lisha NE, Jordan JW, Ling PM. Peer crowd affiliation as a segmentation tool for young adult tobacco use. Tob Control. 2016 Oct;25(Suppl 1):i83-9.

40. Gengler CE, Mulvey MS. Planning pre-launch positioning: Segmentation via
willingness-to-pay and means-end brand differentiators. J Brand Manag. 2017 May 1;24(3):230-49.

41. Chapman S, Ayers J, LeTouzé O, Remard B. Branding and Social Marketing. Psychology of Branding. 2013;171-90.

42. Mulvey MS, Lever MW, Elliot S. A Cross-National Comparison of Intrageneral Variability in Social Media Sharing: Journal of Travel Research [Internet]. 2019 Oct 18; Available from: https://journals.sagepub.com/doi/10.1177/0047287519878511

43. Kim M, Olson S, Jordan JW, Ling PM. Peer crowd-based targeting in E-cigarette advertisements: a qualitative study to inform counter-marketing. BMC Public Health [Internet]. 2020 Jan 23;20. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6977342/

44. Gengler CE, Mulvey MS, Oglethorpe JE. A Means-End Analysis of Mothers' Infant Feeding Choices. Journal of Public Policy & Marketing. 1999;18(2):172-88.

45. Moran MB, Walker MW, Alexander TN, Jordan JW, Wagner DE. Why Peer Crowds Matter: Incorporating Youth Subcultures and Values in Health Education Campaigns. Am J Public Health. 2017 Mar;107(3):389-95.

46. Barnhart M, Peñaloza L. Who Are You Calling Old? Negotiating Old Age Identity in the Elderly Consumption Ensemble. J Consum Res. 2013 Apr 1;39(6):1133-53.

47. Carins JE, Rundle-Thiele SR. Eating for the better: a social marketing review (2000-2012). Public health nutrition. 2014;17(7):1628-39.

48. Pang B, Kubacki K, Rundle-Thiele S. Promoting active travel to school: a systematic review (2010-2016). BMC public health. 2017;17(1):638.

49. Stead M, Gordon R, Angus K, McDermott L. A systematic review of social marketing effectiveness. Health Education. 2007;107(2):126-91.

50. Grier S, Bryant CA. Social Marketing in Public Health. Annual Review of Public Health.
Tables
Table 1: Search strategies and keywords used
| Databases                        | Search strategy                                                                 |
|---------------------------------|---------------------------------------------------------------------------------|
| PubMed                          | (((((physical+activit* OR exercis*)) AND ((intervention* OR Randomi#ed Controlled Trial OR e| studies)) AND social marketing) AND social marketing) AND social marketing) AND (TS=social marketing) |
|                                 | Filters: Full text available; Publication date from 2008/01/01 to 2019/07/01; Humans; English; |
| Web Of Science                  | TS=(physical+activit* OR exercis*) AND TS=(intervention* OR Randomized Controlled Trial OR studies) AND (TS=social marketing) Language: (English OR French) Timespan = 2008-2019; Refined by: Document types = Article |
| EBSCOhost                       | (physical+activit* OR exercis*) AND (intervention* OR Randomized Controlled Trial OR evalual social marketing) Filters: Full text available; Publication date from 2008/01/01 to 2019/07/01; English; French |
| ScienceDirect                   | ("physical activity" OR exercise*) AND (intervention* OR "Randomized Controlled Trial" OR ev AND "social marketing" Filters: Year(s): 2008-2019; Articles types: review articles, research articles, and case reports, |
| Bielefeld Academic Search Engine (BASE) | (physical+activit* OR exercis*) AND (intervention* OR Randomized Controlled Trial OR evalua social marketing Filters : Year(s) : 2008-2019 ; Articles types : Journal / Newspaper ; English ; French |

Table 2: Articles included in the analysis
| Reference                  | Intervention          | Reference                                                                                     |
|----------------------------|-----------------------|------------------------------------------------------------------------------------------------|
| DiGuiseppi et al. (2014)   | N'Balance             | DiGuiseppi CG, Thoreson SR, Clark L, Goss CW, McCallum, and younger adults to take balance classes for fall prevention: A community-based intervention. J Appl Gerontol. 2014;1:23-30. |
|                            |                       | Headley CM, Payne L. Examination of a fall prevention intervention. Journal of Disability and Human Development. 2012;33:23-30. |
| Kamada et al. (2013)       | Communicate           | Kamada M, Kitayuguchi J, Abe T, Taguri M, Inoue S, Ishikawa Y, Nishizaki T, and older people: a cluster randomized trial. Physical Activity. 2013;10:44. |
|                            |                       | Kamada M, Kitayuguchi J, Inoue S, Ishikawa Y, Nishizaki T, and middle-aged and elderly people: a cluster randomized trial. Physical Activity. 2013;10:44. |
|                            |                       | Kamada M, Kitayuguchi J, Abe T, Taguri M, Inoue S, and older Japanese: a 3-year evaluation of a cluster randomized trial. Physical Activity. 2013;10:44. |
| Newton et al. (2015)       | MOVE study            | Newton JD, Klein R, Bauman A, Newton FJ, Mahal BB, and older adults: assessing interventions to maximize attendance. American Journal of Preventive Medicine. 2015;70(2):206-16. |
| Wilson et al. (2015)       | PATH                  | Wilson DK, van Horn ML, Saelens BE, Alia KA, and Physical Activity: The Health Behavior (PATH) Trial for Increasing Walking among older adults. American Journal of Preventive Medicine. 2015;70(2):206-16. |
| Withall et al. (2012)      | Fit and Fab           | Withall J, Jago R, and Fox KR. The effect of community-based social marketing campaigns on physical activity in an underserved community. Preventive Medicine. 2012;55:347-52. |
| Varma et al. (2015)        | Baltimore Experience Corps trial | Varma VR, Tan EJ, Gross AL, Harris G, Romaniello V, and Randomized Controlled Trial. American Journal of Preventive Medicine. 2015;70(2):206-16. |
|                            |                       | Tan EJ, Tanner EK, Seeman TE, Xue Q-L, and Rebok Experience Corps as a social marketing intervention. Preventive Medicine. 2015;70(2):206-16. |
|                            |                       | Tan EJ, Rebok GW, Yu Q, Frangakis CE, and Physical Activity in Older African American Women. Preventive Medicine. 2015;70(2):206-16. |
|                            |                       | Carlson MC, Erickson KL, Kramer AF, and Voss MW. Bolster the experience corps program. Journal of Gerontology A: Biological Sciences. 2015;70(2):206-16. |
Table 3: Assessing the use of the seven reference criteria of social marketing and the observed impact on the increase in physical activity

| Interventions | Target Population | Behavioral Change | Population Study | Segmentation | Exchange | Marketing Mix | Competition | Evaluation | Observed Impact on the Increase in Physical Activity |
|---------------|-------------------|-------------------|------------------|--------------|----------|----------------|-------------|------------|-----------------------------------------------|
| (DiGuseppe et al., 2014) | > 60 yrs | Yes | Yes | No | Yes | Yes | Yes | Yes | Yes |
| (Verma et al., 2016) | > 60 yrs | Yes | Yes | No | Yes | Yes | No | Yes | Yes |
| (Kamada et al., 2018) | 40 – 79 yrs | Yes | Yes | Yes | Yes | Yes | No | Yes | Yes |
| (Newton et al., 2015) | 18 – 79 yrs | Yes | No | No | Yes | Yes | No | No | No |
| (Wilson et al., 2015) | 18 – 85 yrs | Yes | Yes | No | Yes | Yes | No | Yes | Yes |
| (Withall et al., 2012) | ≥18 yrs | Yes | Yes | No | Yes | Yes | No | Yes | Yes |

yrs: years

Figures
Search in the databases  
N = 1724

Articles excluded for 
duplication or irrelevancy  
N=565

Unique articles 
N = 1159

Articles excluded  
- Not social marketing (N=352) 
- Targeting people under 60 years old (N=470) 
- Not physical activity (N=321) 
- Other languages (N=2)

Qualified articles 
N = 14

Backward / Forward research 
N= 6

Final records 
N = 20 articles / 6 interventions

Figure 1
Flowchart of the literature review process