A REVIEW OF
THE EFFECTIVENESS OF SOCIAL MARKETING
PHYSICAL ACTIVITY INTERVENTIONS

Undertaken by

ISM Institute for Social Marketing
A collaboration between the University of Stirling and The Open University

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This paper is part of work contributing to the independent National Review of health-related programmes and social marketing campaigns that was first announced as part of the Public Health White Paper ‘Choosing Health’. The work was undertaken by the National Social Marketing Centre and was published in June 2006.

The discussion and consultation that fed into the development of that White Paper had highlighted a number of concerns. Two of particular relevance to this work were:

- A growing realisation that continuing with existing methods and approaches was not going to deliver the type of impact on key health-related behaviours that was needed.
- Other comparable countries appeared to be achieving more positive impacts on behaviours by using and integrating a more dynamic customer-focused social marketing approach into their methods.

As a result, it was agreed that a National Review should be undertaken to examine the potential of social marketing approaches to contribute to both national and local efforts, and to review current understanding and skills in the area among key professional and practitioner groups.

The National Consumer Council was asked to lead this work as they had been key advocates for a more consumer-focused approach. It was also recognised that an independent aspect to the review would be important so that existing practice across the Department of Health could be considered and recommendations developed.

To inform the National Review a range of research methods and approaches were used. The overarching objectives of the research programme were as follows:

1. To review the growing evidence-base for Social Marketing in some key priority areas
2. To examine current government practice and effectiveness in delivering health-related programmes and campaign interventions.
3. To better understand stakeholder understanding and perceptions of social marketing
4. To consider key behavioural trends and progress towards government health-related targets.
5. To consider and assess the costs to society of preventable ill-health and assess the potential of Social Marketing to contribute to reducing that cost.
6. To map current national capacity to utilise and deliver Social Marketing approaches.
7. To map key social and market research sources available to those developing health-related programmes or campaigns.
While the NSM Centre has a small core team, a larger number of external associates have been actively contributing to developing work. These have included colleagues from a number of research organisations and individual consultants who have been commissioned to assist with developing aspects of the research programme.

This report is one of a range of research and review reports that have informed the National Review.

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Providing comments and views

The research programme is revealing invaluable insights into the use and effectiveness of social marketing related interventions and has provided a robust platform to inform the first National Social Marketing Strategy for Health.

The work however also has a much wider value and interest. Anyone working to elicit positive behavioural effects within different audiences, whatever the focus or topic, should find these reports of interest. It will be of particular relevance to those working on or contributing to health-related programmes and campaigns, whether in public health, health promotion, communications or as dedicated social marketers, at a national or local level.

To encourage debate about Social Marketing we would like to take this opportunity to invite readers to offer their views and feedback on the ways they think health-related programmes and campaigns might be improved, drawing on core social marketing principles.

As other work and material is developed it is being made available via the website on: www.nsmcentre.org.uk. We welcome your comments and ideas which can be emailed to us at: nsmc@ncc.org.uk
Finally, we would like to thank particularly colleagues Ross Gordon, Laura McDermott, Martine Stead, Kathryn Angus and Gerard Hastings, at the Institute for Social Marketing for undertaking this work and contributing to our national review.

Thanks are also due to our other National Social Marketing Centre colleagues and associates who have all helped ensure this work could contribute to the national review.

We look forward to receiving further comments and views.

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1: WHAT IS SOCIAL MARKETING?

The systematic application of marketing concepts and techniques to achieve specific behavioural goals relevant to a social good

In recent years, attention has turned to social marketing as a promising approach for health behaviour change.

It is increasingly being advocated as a core public health strategy, particularly for influencing voluntary lifestyle behaviours such as smoking, drinking, drug use and diet (CDC 2005). The UK Government 2004 White Paper on Public Health recommends that social marketing is used to make behaviour that harms health less attractive, and to encourage behaviour that improves health (Department of Health 2004).

The UK Government 2004 White Paper on Public Health recommends that social marketing is used to make behaviour that harms health less attractive, and to encourage behaviour that improves health (Department of Health 2004). The National Social Marketing Strategy for Health, led by the National Consumer Council and the Department of Health, has been established to “help realise the full potential of effective social marketing in contributing to national and local efforts to improve health and reduce health inequalities” (NCC/DH Realising the Potential of Effective Social Marketing 2005).

Although social marketing has been used to inform interventions for around 30 years, there have been few reviews of its effectiveness in general as a health behaviour change approach. One difficulty has been the lack of an easily operationalised definition of a social marketing intervention.

Generic definitions of social marketing are not precise enough to help in deciding whether a specific intervention does or does not qualify as social marketing. One solution to the difficulty is simply to select interventions that are called social marketing programmes by their managers or evaluators.

However, our recent experience of reviewing ‘social marketing nutrition interventions’ demonstrated that relying solely on the label is a problematic approach (McDermott et al 2005a, McDermott et al 2005b). Firstly, it excludes many interventions which are not labelled social marketing but which incorporate social marketing principles. Secondly, it includes interventions which, despite their label, are poor examples of social marketing or not social marketing at all. The resulting evidence base, if a search is restricted only to interventions called ‘Social Marketing’, is likely to be limited and flawed.

In our previous systematic review, we resolved this challenge by searching instead for interventions which met all six benchmark criteria for a social marketing intervention (Andreasen 2001). Eligible interventions had to provide evidence of:
### Andreasen’s Social Marketing Benchmark Criteria

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<th>Benchmark</th>
<th>Explanation</th>
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<td>1. Behaviour Change</td>
<td>Intervention seeks to change behaviour and has specific measurable behavioural objectives</td>
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<td>2. Consumer Research</td>
<td>Formative research is conducted to identify target consumer characteristics and needs. Intervention elements are pre-tested with the target group.</td>
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<td>3. Segmentation &amp; Targeting</td>
<td>Different segmentation variables are considered when selecting the intervention target group. Intervention strategy is tailored for the selected segment/s.</td>
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<td>4. Marketing Mix</td>
<td>Intervention consists of promotion (communications) plus at least one other marketing ‘P’ (‘product’, ‘price’, ‘place’). Other Ps might include ‘policy change’ or ‘people’ (e.g. training is provided to intervention delivery agents).</td>
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<td>5. Exchange</td>
<td>Intervention considers what will motivate people to engage voluntarily with the intervention and offers them something beneficial in return. The offered benefit may be intangible (e.g. personal satisfaction) or tangible (e.g. rewards for participating in the programme and making behavioural changes).</td>
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<tr>
<td>6. Competition</td>
<td>Intervention considers the appeal of competing behaviours (including current behaviour). Intervention uses strategies that seek to minimise the competition.</td>
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These same criteria have been applied in this review to identify social marketing substance misuse interventions.
2: REVIEW AIM AND METHODS

The aims of the review are:

1. To review how effective social marketing physical interventions have been in changing the behaviour of individuals, groups, organisations and public policy.
2. To map the diversity of social marketing approaches that have been used to address physical inactivity.
3. To describe what, if any, behavioural models / theories are used by campaigners to develop social marketing physical activity interventions.
4. To describe how social marketing physical activity interventions have been evaluated and make recommendations as to how they should be evaluated in the future, including identification of common indicators of short, medium and long-term effectiveness.

Time constraints did not permit us to conduct a systematic search for primary studies. Initially we decided to search for any existing systematic reviews, non-systematic reviews and individual intervention studies in which the label ‘social marketing’ had been applied to programmes.

A series of electronic databases was searched using combinations of the search terms physical activity, exercise and social marketing:

- The Cochrane Library;
- PsycINFO; PubMed;
- The Arts & Humanities Citation,
- Social Science Citation and
- Science Citation Indices;
- The Centre for Reviews and Dissemination’s databases; and
- NICE (the National Institute for Health and Clinical Excellence’s) publications database.

No limits were set on the types of interventions; as social marketing interventions can use many different methods and be implemented in many different settings, it was not desirable to exclude any intervention types at this stage. Although the database searches described above were for papers including the term “social marketing”, as the search process continued, interventions were included for assessment without the term.

This yielded 17 reviews (systematic and non-systematic) and 48 articles in total, covering a range of dedicated physical activity interventions or interventions that included a physical activity component.

Where information on individual interventions was provided in the papers, this was examined for Andreasen’s 6 social marketing benchmarks (Andreasen 2002) to identify if the intervention could be potentially described as social marketing. If insufficient information was provided then the full text of the study articles was retrieved. Supplementary papers were often required to be retrieved to provide information on, for example, a programme’s development.

From the 17 reviews and 48 articles retrieved initially, a further 62 articles were generated and retrieved, totalling 110 articles assessed against Andreasen’s six criteria.

22 interventions met all six of Andreasen’s criteria for a social marketing intervention, and were included in the review.
3: THE STUDIES

The 22 studies represented a wide range of different types of intervention, and were heterogeneous in aims, intervention approach, methods, and evaluation design. The interventions were concerned with increasing knowledge of benefits of physical activity, dangers of inactivity, and increasing levels of physical activity.

19 of the 22 interventions targeted physical activity within the context of a range of cardiovascular risk factors (e.g. diet, physical activity, blood pressure, and smoking)

Only 3 of the included social marketing physical activity interventions were exclusively focused on physical activity

3.1: Types of Intervention

These comprise the following:
I: Community Interventions
II: School-based in Interventions
III: Mass media-based Intervention
IV: Interventions in other settings

I: Community Interventions

- 14 interventions were community based interventions.

- All 14 interventions targeted levels of physical activity as an outcome.
- 2 of the 14 targeted and reported knowledge outcomes
- 6 of the 14 interventions targeted the general population.
- 10 studies targeted specific sub groups within the community either exclusively or as a component of the community intervention, such as:
  - Ethnic minorities (Brownson 1996, Lewis 1993)
  - Older people (Matsudo 2002, Reger 2002)
  - Newly married couples (Burke 2002)
  - People with low levels of literacy (Gans 1999).

- 2 of these interventions included efforts to change policy with regards to physical activity
- Several of the studies within this group of community interventions are internationally renowned programmes that have been evaluated over a number of years such as
The Minnesota Heart Health Program (Luepker 1994)

The North Karelia Project (Puska 2002)

The Pawtucket Heart Health Program (Gans 1999).

II: School-based Interventions

- 7 interventions were school-based

- All 7 comprised theory driven classroom curricula involving understanding benefits of physical activity and risks of sedentary behaviour.
- Classroom education took place alongside activities in other channels such as:
  - Mass media campaigns (Huhman 2005)
  - School and community events (Caballero 2003, Nader 1992)
  - Efforts at policy change (Sallis 2003, Neumark-Sztainer 2003).

III: Mass media-based Interventions

- 1 intervention was primarily mass media based = the VERB project which targeted levels of physical activity and knowledge outcomes. (Huhman 2005)

- The project was targeted at school children aged 9-13 and the intervention included activities delivered through other channels in addition to the media element such as educational materials and community events.

IV: Interventions in Other Settings

- Although several of the multi-component community based interventions included activities based in the workplace only 1 intervention included in this review was exclusively work based.

Social Marketing for Public Health Employees study (Neiger 2001)
- This was exclusively based in the workplace of public health employees of the Utah Department of Health.

GEMS Pilot Study (Baranowski 2003)
- Based in summer camps and homes of the targeted children for the Houston, Texas, branch of the intervention, but was primarily a multi component project and primarily community based.
3.2: Theories and Models Used in the Programmes

The majority of the included studies were based on one or more theoretical models used to inform development and design of the interventions.

Social Cognitive or Social Learning Theory

- 13 studies used this, the most common theoretical base for interventions.
- The Social Cognitive theory explains how people acquire and maintain certain behavioural patterns, while also providing the basis for intervention strategies (Bandura, 1997).
- Social Cognitive Theory emphasizes the interactions between a person’s cognitions, on the one hand, and his/her behaviour on the other, through processes such as self-efficacy and outcome expectancies (or response efficacy).
- Evaluating behavioural change depends on the factors environment, people and behaviour. Social Cognitive Theory provides a framework for designing, implementing and evaluating programmes.

The Trans-theoretical model

- The trans-theoretical model hypothesises that behavioural change unfolds through a series of stages. That is, individual progress through a series of stages in recognizing the need to change, contemplating a change, making a change, and finally sustaining the new behavior. Therefore in this model it is critical to understand and identify the stage an individual is in before a successful change intervention can be designed and applied.

Stage theory of innovation

- 1 intervention used this in its design (Brownson 1996).
- This theoretical perspective defines diffusion as the process by which an innovation is communicated through certain channels over time among the members of a social system.
- The four main elements of the model are
  - Innovation, (ideas, practices, objects)
  - Communication channels,
  - Time, and
  - Social system.
- Therefore the model can be applied to the diffusion of health strategy such as physical activity interventions.

Behaviour change theory

- 1 intervention used this in its development (O’Loughlin 1999)

Organisational change theory

- 1 intervention that was based on organisational change theory (Luepker 1996).

Planned approach to community health model

Community participation
• 2 studies were based on community participation (Gans 1999, Luepker 1994).

Community behavioural psychology
• 1 intervention used this in its design (Gans 1999).

The relapse prevention model
• 1 intervention used this (Prochaska 2004).

Theory of planned behaviour
• 1 intervention was informed by the theory of planned behaviour (Reger 2002).

Structural, ecological model of health behaviour
• 1 intervention used this to inform its development and design (Sallis 2003).

Social marketing framework
• 2 interventions used this to inform their development and design (Neiger 2001, Huhman 2005).

Innovation diffusion – communication perception model
• One intervention used innovation diffusion, the communication perception model and the hierarchical communication model (Puska 2002).
3.3: Target Groups

Many of the physical activity interventions were targeted at a particular group.

- 11 interventions were targeted at young people

- 2 interventions included components targeted at older people

- 2 interventions were targeted at low income groups
  - (O’Loughlin 1999, Brownson 1996).

- 8 interventions were targeted at minority ethnic groups

Studies targeted at low income and minority ethnic groups drew particular attention to the fact that these groups were more likely to display higher than average levels of sedentary behaviour due to a range of socio-economic factors, and that barriers often prevented access to physical activity.

- 1 intervention was targeted at people with low levels of literacy
  - (Gans 1999).
3.4: How the Interventions were Evaluated

The majority of the interventions were evaluated using a randomised controlled trial or quasi-experimental design.

- 10 were randomised controlled trials
- 3 used a randomised cross over design
- 6 were quasi-experiments
- 2 used longitudinal cohort surveys
- 3 were uncontrolled studies.

For the school-based programmes, this typically involved random assignment of classes or schools to an intervention or control condition, while for the multi-component community and media interventions, intervention sites were typically compared with comparison communities matched on key characteristics. The period of follow-up ranged widely in the studies from a month after implementation to several years.

- The majority of the studies involved one to two year follow-up.

- The main outcomes examined in the physical activity programmes included level of physical activity; (by frequency, total kcal expended, minutes spent on physical activity, or distance covered).

- Levels of physical activity were measure in a variety of different ways across the interventions.

- Measures of level of physical activity are not mutually exclusive in interventions and several studies used more than one measure.
  - (Reger 2002) For example used both time spent in and frequency of physical activity sessions to measure behavioural outcomes.

- 15 interventions used time spent (the most frequently occurring measure of level of physical activity)

- 9 interventions used frequency of physical activity behaviour as a measure

- 3 interventions used levels of expended energy in kilocalories to measure levels of physical activity

- Several of the interventions that used both ‘time spent in’, and ‘frequency of’ physical activity used this information to compute physical activity scores such as Metabolic Equivalent (MET) weighted scores.
  - As used in the Go Girls intervention (Resnicow 2000).

- However there was wide variance and a lack of consistency across interventions using such measures.

- Use of an outcome measure based on a commonly accepted physical activity score would be an extremely useful tool for drawing comparisons across interventions as this would allow evaluations to be made on a more like for like basis.
• The lack of a universally accepted measure of level of physical activity poses a problem when conducted a review of this nature as it can be difficult to conduct comparisons across interventions using different measures and therefore extrapolate clear conclusions.

• Another issue surrounds basing measures on self reporting of physical activity as some interventions reported decreased fitness levels of participants despite a self reported increase in physical activity suggesting that self-reports can generate overestimation of level of activity and cause problems with validity.

• Some of the included interventions also took:
  o Knowledge measures
    ▪ knowledge of intervention messages,
    ▪ knowledge of benefits of physical activity / dangers on sedentary lifestyle)
  o Psychosocial measures, such as
    ▪ self efficacy to physical activity,
    ▪ social support for physical activity.

• Physiological outcomes were also reported in several of the included studies, including:
  o Blood pressure,
  o Cholesterol level and
  o BMI – Body Mass Index
3.5: Social Marketing Characteristics of the Interventions

All included interventions had to show evidence of having met all 6 Social Marketing benchmarking criteria.

This meant that they had to:

I: Have a specific Behaviour Change goal.
- Behaviour change goals sought by the included interventions comprised increasing actual levels of physical activity, (all of the included studies) and increasing knowledge and awareness of the importance of a recommended level of physical activity or other knowledge related outcomes,

II: Have used Consumer Research to inform the intervention.
- Typical consumer research conducted by the interventions included:
  - Community needs assessments
    - (Goodman 1995)
  - Focus groups
    - (Huhman 2005)
  - Pre-testing of materials
    - (Neiger 2001)
  - Pilot tests of intervention activities
    - (Gans 1999).

III: Consider different Segmentation variables and Target interventions appropriately
Interventions demonstrated segmentation and targeting if they
- Designed interventions to be age-appropriate
- Particularly appropriate to the setting in which they were delivered
  - (Brownson 1996)
- Tailored activities and materials to specific groups, such as low income
  - (O’Loughlin 1999, Brownson 1996)
- Minority ethnic participants
  - (Brownson 1996, Lewis 1993)
Displaying particularly high levels of physical inactivity.

IV: Demonstrate use of more than one element of the Marketing Mix.
For example, a typical combination of marketing mix elements in a community based intervention was:
- Fitness classes held in community halls (product)
- Plus media materials (Promotion) such as TV adverts
  - (Huhman 2005)
- Pamphlets
  - (Goodman 1995)
- Stickers
  - (Matsudo 2002, Huhman 2005)
- Training of professional and other staff to give advice and training or coaching on physical activities (people)
V: Utilise the ‘exchange’ concept
i.e.: Consider what would motivate people to engage voluntarily with the intervention and offer them something beneficial in return (Exchange). The exchange could be tangible or intangible.
Examples include:
- Community-based programmes which emphasised the positive benefits of increased physical activity such as feeling healthier, improved appearance and increased confidence
- Examples of tangible exchange include:
  - Intra or intercommunity competitions
    - (Lewis 1993, Huhman 2005) and
  - Rewards for continued participation such as certificates
    - (O’Loughlin 1999)
  - Prizes
    - (Luepker 1996)
- All of which motivate people to engage with an intervention.

VI: Utilise the ‘competition’ concept
i.e.: Consider the appeal of competing behaviours and use strategies that seek to minimise this Competition.

Competition strategies included:
- Providing childcare facilities
  - (Lewis 1993)
- Travel subsidies, holding fitness classes at suitable and convenient times
  - (Matsudo 2002, Nader 1992)
- Emphasising the fun nature of forms of activity compared to other leisure pursuits
  - (Huhman 2005).

More detailed information on the social marketing characteristics and results of each intervention is provided in Appendix 3.
4: RESULTS

- 22 included studies
- 10 showed an overall positive effect
- 8 showed mixed results
- 4 showed no effect on overall outcomes

A breakdown of outcome variable measures and results of the included studies follows:

4.1: Behaviour (Increased Levels of Physical Activity)

- 21 of the 22 included studies targeted at least one behavioural outcome, most commonly an increased level of physical activity based on total time spent or frequency of activity.
- 8 of the 21 reported a significant positive effect on behaviours.

Positive results:

For example:
**Social Marketing for Public Health Employees (Neiger 2001)**
- A quasi experimental design, pre-test post-test format study with primary and secondary treatment groups, had a positive effect on behavioural outcomes. This workplace-based, ten week intervention comprised communications and promotions, ongoing activities, one-off events and environmental changes.
- Pre-test to post-test differences were noted in primary treatment group on three levels of physical activity, and the application of the intervention was generally effective at increasing physical activity levels measured by frequency.

**The Wheeling Walks intervention (Reger 2002)**
- This was also successful at affecting behavioural outcomes. This was a community based campaign to promote walking among sedentary 50 to 65 year old adults in the city of Wheeling, West Virginia, USA.
- The study was of a quasi-experimental design with control group. The intervention used the theory of planned behaviour and transtheoretical model constructs to change behaviour by promoting daily walking through paid media, public relations and public health activities. Wheeling Walks had a positive effect on physical activity levels with behaviour observation and self reporting showing a small positive effect.

No effect:

- 6 studies reported a non-significant change in behaviour.

For example
**Coeur en sante St-Henri programme.**
• A study targeted at adults in a low income inner city neighbourhood in Montreal, Quebec, Canada. The 4-year community programme aimed to reduce cardiovascular risk factors (smoking, diet, blood pressure, physical activity). The study was of randomised, controlled design and was underpinned by social learning theory, the behaviour change theory and community participation.
• The intervention included, direct mail, a walking club, distribution of videos, mass media, and workplace workshops. No statistically significant programme effects were detected, and physical inactivity increased in both intervention and control communities.

Mixed results:
• 7 of these studies reported mixed results.

For example
Perth – cohabiting couples
• (Burke 2002)
• This intervention was aimed at 78 couples cohabiting for less than 2 years in Perth, Western Australia. The study was community based, and of randomised control trial design. The intervention consisted of interactive group sessions and mail outs. It was found that activity levels increased, but between group differences were not significant.

Physical Activity for Risk Reduction Project (PARR) intervention
• (Lewis 1993)
• Was aimed at low income residents in rental communities of the Housing Authority of the Birmingham District in Birmingham, Alabama, USA produced mixed results. The study was of randomised controlled design, and incorporated a 3 year constituency based physical activity promotion programme. The intervention used community based exercise programmes, walking and aerobic dance classes, videos, pamphlets and behaviour interventions.
• The pre and post intervention physical activity scores for physical activity levels were not significantly different in intervention communities. However physical activity levels did increase in intervention communities among young people and women.
4.2: Knowledge

- 4 studies measured knowledge outcomes

- All 4 reported a positive effect.
- All measured knowledge of behaviour risks
- 3 measured knowledge of recommended levels of physical activity.

For example

**The Agita Sao Paolo Program** (Matsudo 2002)

- Aimed at the residents of the city of Sao Paolo, Brazil, was a multi-level community wide intervention designed to promote physical activity. Activities were encouraged in three settings: home, transport and leisure time.
- The intervention had a positive effect on knowledge of physical activity benefits and risk behaviours, achieved through the communication strategy of the programme.

4.3: Psychosocial Variables

- 11 studies attempted to influence physical activity related psychosocial variables

- 6 or the 11 reported a positive effect for at least one variable.
- This suggests that although increased level of physical activity can be difficult to achieve, interventions can be successful at changing attitudes and perceptions towards physical activity and that perhaps continued or follow up interventions could build upon this to effect behavioural change.

**Positive results:**

For example:

**Pathways** (Caballero 2003)

- Was a school based intervention aimed at 1704 American-Indian children in 3rd-5th grades in 41 schools in Arizona, New Mexico and South Dakota, USA.
- The programme comprised a physical activity programme supplemented by a classroom curriculum and family component.
- Outcome evaluation found that self efficacy to physical activity was significantly higher in the treatment group than the control group.
- It was also found that there was a positive effect on stage of change to physical activity.

**The New Moves intervention** (Neumark-Sztainer 2003)

- Targeted school girls in the Twin Cities (Minneapolis-St Paul) district of Minnesota, USA and was successful at producing a positive effect on psychosocial outcomes.
- The programme was a multi-component, school based obesity prevention programme, of randomised controlled study design.
- The intervention incorporated a class based curriculum, physical activity classes, instruction and education packs.
It was found that in terms of psychosocial outcomes there was a progression in state of behavioural change.

No effect:

- 5 interventions showed no effect on psychosocial outcomes.

For example:

**The CATCH programme (Luepker 1996)**
- Aimed at third grade students from 28 schools located in California, Louisiana, Minnesota and Texas, USA was one such study. The intervention intended to improve diet and physical activity among school students.
- The 2 year intervention included both school based and family based components, including class curricula, physical activity classes, home activities programme, family fun night.
- However in terms of psychosocial outcomes, positive social support for physical activity did not differ significantly between intervention and control groups.

Self efficacy as outcome measure:

- 7 studies measured levels of self efficacy to physical activity as an outcome measure.
  - 2 of the 7 studies significantly improved self efficacy in relation to physical activity.
    - (Caballero 2003, Neiger 2001)

- A range of other psychosocial outcomes were also successfully influenced across many interventions.

Social support as outcome measure:

- 4 studies used measures of social support from family and friends for physical activity as a psychosocial outcome measure.
  - 2 of this 4 reported a positive effect.
    - (Resnicow 2000, Nader 1992)
  - 4 studies reported stage of change outcomes
  - 3 of this 4 had a positive effect.
    - (Neumark-Sztainer 2003, Caballero 2003, Reger 2002)
4.4: Physiological Outcomes

- 14 studies measured physiological outcomes

- Physiological outcome measures such as Body Mass Index (BMI), cholesterol level and blood pressure were also used in several of the included interventions. The majority of these interventions used more than one physiological outcome measure when publishing results.

  11 of the 14 studies used Body Mass Index (BMI) as a measure.

  - 2 of these 11 showed a positive effect
    - (Burke 2002, Gans 1999)

  - 6 showed no effect

  - 3 showed mixed results

- 6 of the included studies that measured physiological outcomes used cholesterol levels as a measure.

  - 3 of these 6 showed a positive effect

  - 3 of these 6 showed no effect

- 2 of the interventions used CVD as a measure
- Both interventions seeing a reduction in CVD rates.
  - (Puska 2002, Gans 1999)

- 5 of the interventions measuring physiological outcomes used blood pressure as a measure.

  - 1 of these 5 interventions showed a positive effect
    - (Burke 2002)

  - 4 studies showed no effect.

- However improvement in physiological outcome measures does not automatically suggest improvement in levels of physical activity as the multi-component nature of several of the interventions reporting improved physiological outcomes make it difficult to disaggregate the strength of the effect individual components have on outcome results.
Positive results:
- 4 of the 14 studies showed positive effects.

For example:
**The North Karelia Project** *(Puska 2002)*
- This was successful at reducing the level of Cardiovascular Disease (CVD) in the intervention region.
- The project was a long term (25 year) multi-component community intervention designed to reduce CVD rates in a high risk population region.
- The programme incorporated a media campaign, professional training, organised activities and efforts at policy change. In terms of physiological outcomes there was an overall 75% reduction in annual mortality rate of coronary heart disease in the working population of the region and there was a significant reduction in cholesterol levels.

**The Pawtucket Heart Health Program** *(Gans 1999)*
- This was aimed at Adults in a Rhode Island city with relatively low mean household income.
- The 7-year multi-component community intervention was designed to reduce cardiovascular risk factors and comprised formal behaviour change programmes (including counselling and groups), grass-roots community and worksite activities, volunteer delivery, unpaid publicity and weight loss contests.
- There was a reduction in CVD rates by 16% compared to control, and no increase in BMI compared to increase in control to a significant level.

Mixed results:
- 4 studies showed mixed results.

For example:
**The GEMS Pilot Study** *(Baranowski 2003)*
- This was aimed at 35 African American girls aged 8-10, 35 and their parents in a summer day camp and homes in Houston, Texas, USA.
- The project was community based and also utilised a summer camp setting. Girls in the intervention group attended a 4 week summer camp, followed by an 8 week home internet intervention for girls and their parents.
- However the programme produced no significant effect on Body Mass Index (BMI) amongst the participants.

No effect:
- 6 studies showed no effect.

For example:
**The San Diego Family Health Project** *(Nader 1992)*
- Aimed at Anglo, Black and Mexican-American families of young elementary school children, in the city of San Diego, California, USA failed to produce a positive effect.
- The intervention comprised a 3 month cardiovascular disease risk reduction education project to increase frequency of aerobic exercise.
- However the intervention produced no significant effect on blood pressure levels in the intervention population.
4.5: Environmental / Policy Effects

- 6 interventions were designed to directly effect policy change with regard to physical activity

- However, several of the multi-component interventions aimed to effect policy in other areas such as nutrition, for example new food policy in school canteens within a region.
- Policy change in the realm of physical activity includes adoption of physical activity programme by schools, construction of a network of leisure space or facilities within a community (Prochaska 2004), or even formal adoption as part of national chronic disease prevention and health promotion policy (Puska 2002).

For example:

**The Bootheel Heart Health Project** *(Brownson 1996)*
- An evaluation of environmental factors was conducted and walking paths were constructed in low income communities where cost was a barrier to other forms of physical activity. This led to the adoption of a policy to construct a network of such paths throughout the community.

**The CATCH intervention** *(Luepker 1996)*
- This took an environmental and policy approach to enrich physical activity classes, leading to increased student's physical activity in class and out of school, policy changes that were maintained following the intervention.

**The M-Span intervention** *(Sallis 2003)*
- In this intervention key school personnel met regularly with project staff to select and implement policy changes to create healthier school environments. Participants in the meetings included administrators, physical educators, staff, student body organisations, parents and students. Policy goals were identified and action plans rolled out to effect policy change, for example ‘Provide supervision and transportation for student physical activity after school’ and ‘upgrade of PE facilities and equipment.’ Policy goals such as these examples were printed in school newsletters and distributed widely throughout the school and local community.
- The progress on policy goals was monitored in subsequent meetings. However the outcome paper of the M-Span intervention reports that although there were examples of successful policy change such as allowing students to use activity areas after school, ‘the effectiveness of policy change committees varied widely, and project support for the groups was probably inadequate to yield meaningful policy changes in most schools.’
- This demonstrates that for social marketing physical activity interventions to be successful at effecting policy change their needs to advocacy and political support for change.

**The North Karelia Project** *(Puska 2002)*
- Policy changes were effected which led to the provision of dedicated walking space and recreational areas assisting in the delivery of the intervention.
- The success of the name North Karelia Project led the intervention being rolled out nationally to cover the whole of Finland.
- The North Karelia Project proved that a major national demonstration programme can be a strong tool for favourable national development in chronic disease prevention and health promotion that can be adopted as national policy.
The New Moves study (Neumark-Sztainer 2003)
- Qualitative research indicated that feasibility of implementing the New Moves schools programme was high, as indicated by strong satisfaction among participants, parents and school staff and by programme sustainability.
- Following the end of the intervention period the New Moves programme was formally adopted to physical activity policy at the three intervention schools.

The Pawtucket Heart Health Program (Gans 1999)
- This aimed to influence the environment in which risk factor behaviours occurred, leading to efforts to effect policy change within the community.
- These efforts led to the construction of a series of leisure facilities and a multiple station exercise course.

Outcome measures
- No specific outcome measures on policy change were described in these interventions, and it is often difficult to measure whether policy change has occurred and what the drivers of policy change are.
- Also several of the other included interventions by their nature may have aimed to influence policy but did not report this.
- For social marketing physical activity interventions to be successful at influencing policy and effecting policy change there is a requirement for commitment to change and political support for this.
- Furthermore formal efforts need to be made as part of the intervention to network and become a part of the policy process through meetings and organisational links.
- It is apparent however that social marketing physical activity interventions can feed into the policy process and help to influence changes in policy on physical activity.
5: DISCUSSION

Overall the findings demonstrate that social marketing interventions can increase levels of physical activity and knowledge of the benefits, and dangers of inactivity.

The majority of studies (n=13) reported at least one significant behavioural change in a desired direction. The studies were of a reasonable quality although five did not use control or comparison groups (Matsudo 2002, Brownson 1996, Resnicow 2000, Puska 2002, Huhman 2005).

Randomisation was used in eleven studies, although this was often undertaken at a unit level (e.g. school or even county) as opposed to an individual level. Many of the study populations (and samples taken from them) were focused on minority groups, limiting the generalisability of findings to wider populations.

In addition, in cases where interventions comprised several components, overall results were reported, making it difficult to assess the relative contribution of different intervention elements.

One limitation of studies in this area is the lack of a universally used and accepted measure of levels of physical activity. This causes problems in comparing across interventions and extrapolating conclusions. It may be more useful to compare exact like for like interventions using the same outcome measures for level of physical activity but for a review of this nature this would not be appropriate.

Nonetheless conducting a review of this nature of social marketing physical activity interventions does provide a useful information source and gives a useful overall analysis on their general effectiveness.

Despite these weaknesses, there was evidence that social marketing physical activity interventions were effective at influencing behaviour, knowledge of the benefits of physical activity and psychosocial variables such as self-efficacy and social support, and physiological measures such as BMI, cholesterol and blood pressure.

Although some of the interventions showed only a moderate or no significant improvement in behavioural outcomes, namely levels of physical activity, these studies often displayed positive psychosocial outcomes such as state of behavioural change, self efficacy to physical activity or social support for physical activity.

This suggests that although increased level of physical activity can be difficult to achieve interventions are successful at changing attitudes and perceptions towards physical activity and that perhaps continued or follow up interventions could build upon this to effect behavioural change.

They also appear to have a more limited effect on physiological outcomes such as blood pressure, body mass index and cholesterol. This latter finding might be expected, as these kinds of outcomes are arguably more difficult to influence, and changes are likely to take a much longer time to occur and be detected. In addition, physiological outcomes are influenced by other factors in addition to physical activity, including diet and smoking.

Interventions were implemented in a range of settings - schools, workplaces, the family, youth centres, 'the community' - and there was evidence that social marketing interventions could be effective in all these settings. The small number of interventions in some settings
meant that it was not possible to explore any relationship between setting type and effectiveness. Future reviews with larger numbers of less heterogeneous studies could perhaps examine the relationship between setting and effectiveness more closely. However, a more helpful question than ‘are workplaces better settings than schools?’ perhaps concerns how features of the setting are utilised and positively exploited in the overall social marketing strategy.

For example, in the Bootheel Heart Health Project (Brownson 1996), which had a positive effect on physical activity, the community setting itself played an integral part in the delivery of the intervention. Walking paths were constructed in communities linking them in with local community venues where intervention components were carried out.

In other studies, the intervention setting seemed to have been selected primarily for convenience reasons and was not particularly exploited in the intervention strategy. For example, in the San Diego Family Health Project (Nader 1992), families attended group educational meetings at the local school, but no information is given as to whether this setting was judged to be particularly appropriate for the targeted families or how it was harnessed in support of the programme goals.

The tendency for physical activity interventions to be part of wider studies targeting a reduction in cardiovascular disease risk reduction can dilute the effectiveness of the physical activity element. In many such interventions there is a prioritisation towards smoking cessation or improving diet, and often physical activity elements are added at a later date (Puska 2002) and/or given less weight in the strategy of the overall programme. This can impact on outcomes, for example in the Heart to Heart Project (Goodman 1995) the project had a slightly favourable effect on cholesterol and smoking, but failed to have an effect on levels of physical activity.

Although there is no strong evidence to suggest that multi-component interventions are any less effective there may be a danger that interventions on physical activity can lose priority or messages are lost when competing with other components.

If an intervention is based on a sound theoretical framework and incorporates extensive formative research there is a greater likelihood of success. However this needs to be properly implemented on the ground and often problems with support on the frontline can cause a well designed intervention to fail.

Another issue regards the length of intervention as with short term physical activity interventions it can be very difficult to gain quick results. Interventions that were implemented over a longer period of time such as the North Karelia Project (Puska 2002) have proved very successful at increasing levels of physical activity and overall reductions in CVD rates and levels of risk behaviours and it should be recognised that the longer time period for an intervention brings a greater change of seeing a positive effect.

An example of a social marketing physical activity intervention that featured the desired components of formative research, a sound theoretical framework and a longer term implementation period is the M-Span intervention (Sallis 2002, a School based physical activity interventions carried out over 2 years, designed to increase physical activity in physical education classes and throughout the school day.

The project was of randomised control trial design and was based on a structural, ecologic model of health behaviour. Formative research was carried out and baseline data was used to inform the development of the intervention. The intervention comprised monthly peer led educational sessions, reminder telephone calls, issuing of materials such as pamphlets, and
measured efforts to effect policy change including policy goal setting and regular stakeholder meetings.

The strong overall design of the intervention may have played a large part in the successful outcomes with randomised regression models revealing a significant intervention effect for physical activity for the total group and boys and physiological survey data indicating that the interventions reduced reported body mass index (BMI) for boys.

The M-Span intervention is a good example of a social marketing intervention in which the structure, design and implementation of the study was sound and well executed and future interventions should aim to incorporate the characteristics displayed by interventions such as this.
REFERENCES


Bauman A. Commentary on the VERB campaign - perspectives on social marketing to encourage physical activity among youth. Prev Chronic Dis 2004;1:A02


Kotler P, Zaltman G. Social marketing: an approach to planned social change. *J Mark* 1971; **35**: 3-12


**APPENDIX 1**

**Physical Activity Review**

**Record of Electronic Searches**

1. **The Cochrane Library**
   1. “physical activity” in All Fields and “social marketing” in All Fields
   2. “physical activity” OR exercise in Record Title and “social marketing” in All Fields

2. **PsycINFO**
   1. (social marketing) and (physical activity)
   2. (social marketing) and (exercise)
   3. (Social marketing) and (physical)

3. **Arts & Humanities Citation, Social Science Citation and Science Citation Indices (combined at Web of Knowledge)**
   1. Combined searches:
      
      \[\text{TS}=(\text{physical activity})\]
      \[\text{DocType}=\text{All document types}; \text{Language}=\text{All languages}; \text{Database(s)}=\text{SCI-EXPANDED, SSCI, A&HCI}; \text{Timespan}=1945-2005\]

      \[\text{TS}=(\text{"social marketing"})\]
      \[\text{DocType}=\text{All document types}; \text{Language}=\text{All languages}; \text{Database(s)}=\text{SCI-EXPANDED, SSCI, A&HCI}; \text{Timespan}=1945-2005\]

   2. Combined searches:
      
      \[\text{TS}=(\text{"social marketing"})\]
      \[\text{DocType}=\text{All document types}; \text{Language}=\text{All languages}; \text{Database(s)}=\text{SCI-EXPANDED, SSCI, A&HCI}; \text{Timespan}=1945-2005\]

      \[\text{TS}=(\text{"systematic review"})\]
      \[\text{DocType}=\text{All document types}; \text{Language}=\text{All languages}; \text{Database(s)}=\text{SCI-EXPANDED, SSCI, A&HCI}; \text{Timespan}=1945-2005\]

   3. Search:
      
      \[\text{TS}=(\text{"social marketing" AND exercise})\]
      \[\text{DocType}=\text{All document types}; \text{Language}=\text{All languages}; \text{Databases}=\text{SCI-EXPANDED, SSCI, A&HCI}; \text{Timespan}=1900-2005\]

   4. Search:
      
      \[\text{TS}=(\text{"social marketing" AND physical})\]
      \[\text{DocType}=\text{All document types}; \text{Language}=\text{All languages}; \text{Databases}=\text{SCI-EXPANDED, SSCI, A&HCI}; \text{Timespan}=1900-2005\]

**CRD (Centre for Reviews and Dissemination)**

1. “social marketing” AND “physical activity”
2. “social marketing” AND exercise
3. “social marketing”

**PubMed**

1. "social marketing" AND (physical OR exercise)

**NICE (the National Institute for Health and Clinical Excellence)**

Browsed Physical Activity Health Topics.
APPENDIX 2

Physical Activity Review
Studies included

Baranowski 2003

Beech 2003

Brownson 1996

Burke 2002


Caballero 2003


Gans 1999


Goodman 1995

Huhman 2005


**Lewis 1993**


**Luepker 1994**


**Luepker 1996**


**Matsudo 2002**


**Nader 1992**


Neiger 2001

Neumark-Sztainer 2003

O'Loughlin 1999


Prochaska 2004


Puska 2002


Reger 2002

Resnicow 2000

Sallis 2003
Story & Sherwood 2003
## Physical Activity: Overview of included Studies

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<th>Study Description</th>
<th>Authors and Years</th>
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<td>Brownson 1996</td>
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<tr>
<td>VERTB</td>
<td>Huhman et al 2005 / Wong et al 2004 / Bauman 2004</td>
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<tr>
<td>Agita Sao Paolo Program</td>
<td>Matsudo 2002</td>
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<tr>
<td>Social Marketing For Public Health Employees</td>
<td>Neiger 2001</td>
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<tr>
<td>Wheeling Walks</td>
<td>Reger 2002</td>
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<tr>
<td>M-SPAN: Middle School Physical Activity &amp; Nutrition Study</td>
<td>Sallis 2003</td>
</tr>
<tr>
<td><strong>MIXED RESULTS</strong></td>
<td></td>
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<tr>
<td>GEMS: Girls Health Enrichment Multi-Site Studies</td>
<td>Baranowski 2003</td>
</tr>
<tr>
<td>GEMS: Girls Health Enrichment Multi-Site Studies</td>
<td>Beech 2003</td>
</tr>
<tr>
<td>An Innovative Program For Changing Health Behaviours</td>
<td>Burke 2002 / Burke et al 2004</td>
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<tr>
<td>PARR: The Physical Activity For Risk Reduction Project</td>
<td>Lewis 1995</td>
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<tr>
<td>New Moves</td>
<td>Neumark-Sztainer 2003 / Neumark-Sztainer et al 2003</td>
</tr>
<tr>
<td>North Karelia Project</td>
<td>Puska 2002 / Puska et al 1983 / Puska et al 1995</td>
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<tr>
<td>GEMS: Girls Health Enrichment Multi-Site Studies</td>
<td>Story &amp; Sherwood 2003</td>
</tr>
<tr>
<td><strong>NO EFFECT</strong></td>
<td></td>
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<tr>
<td>Heart To Heart Project</td>
<td>Goodman 1995</td>
</tr>
<tr>
<td>GO GIRLS!</td>
<td>Resnicow 2000</td>
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</tbody>
</table>
## Physical Activity Interventions: Social Marketing Characteristics

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<thead>
<tr>
<th>Intervention Name &amp; Authors</th>
<th>Participants &amp; Setting</th>
<th>Intervention</th>
<th>SM Characteristics</th>
<th>Results</th>
</tr>
</thead>
</table>
| **Baranowski 2003**  
(GEMS) The Girls Health Enrichment Multi-Site Studies | 35 African American girls aged 8-10, 35 and their parents in summer day camp and homes in Houston, Texas, USA. | Community based, also summer camp setting. 12 week two arm parallel group randomised controlled pilot study design. Girls in the intervention group attended a 4 week summer camp, followed by an 8 week home internet intervention for girls and their parents. Based on social cognitive theory. | 1. Behaviour change goal: To prevent obesity by increasing levels of physical activity.  
2. Consumer research: Extensive formative assessment including focus groups.  
3. Segmentation and targeting: African American girls aged 8-10 with a certain range of Body Mass Index.  
4. Marketing mix: Child targeted programmes (group sessions and activities), parent programmes, events, summer camp, internet based intervention.  
5. Exchange: Small gifts and incentives offered for continued participation, goal setting.  
6. Competition: Recognised potential influence of family members, social support to address barriers through buddy system. | Mixed results:  
Physical activity levels: No significant differences between treatment and control group. Measures: Time.  
Physiological: No significant effect on BMI. |
<table>
<thead>
<tr>
<th>Intervention Name &amp; Authors</th>
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<th>Intervention</th>
<th>SM Characteristics</th>
<th>Results</th>
</tr>
</thead>
</table>
| Beech 2003 (GEMS) The Girls Health Enrichment Multi-Site Studies | 60 African American girls with specific BMI range, along with their parents/caregivers in community centres in Memphis, Tennessee, USA. | Community based, 12 week parallel group randomised controlled pilot study design. Active interventions held in community centres involved highly interactive weekly group sessions with either girls (child-targeted programme) or parents/caregivers (parent-targeted programme). Content focused on knowledge & behaviour change skills to promote healthy eating and increased physical activity. Based on social cognitive theory. | 1. Behaviour change goal: To prevent obesity by increasing levels of physical activity.  
2. Consumer research: Extensive formative assessment including focus groups.  
3. Segmentation and targeting: African American girls aged 8-10 with a certain range of Body Mass Index.  
4. Marketing mix: Child targeted programmes (group sessions and activities), parent programmes, events, summer camp, internet based intervention.  
5. Exchange: Small gifts and incentives offered for continued participation, goal setting.  
6. Competition: Recognised potential influence of family members, social support to address barriers through buddy system. | Mixed results:  
Physical activity levels: Girls in the intervention group increased their level of moderate to vigorous activity by 12%.  
Measures: Time.  
Psychosocial: Showed no significant improvement in self efficacy for Physical activity scores in treatment group.  
Physiological: Trend towards reduced BMI. |
<table>
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<tr>
<th>Name &amp; Authors</th>
<th>Setting</th>
<th>Intervention</th>
<th>SM Characteristics</th>
<th>Results</th>
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</thead>
</table>
| **Brownson 1996** *Bootheel Heart Health Project* | Adults in six south-eastern counties of Missouri, USA. | Communities based activities such as exercise groups, blood pressure and cholesterol screenings, and cardiovascular disease education were conducted in six south eastern Missouri counties. Uncontrolled, cross-sectional sample design. Intervention conducted over 4 years. Based on the planned approach to community health model, social learning theory and the stage theory of innovation. | 1. Behaviour change goal: To reduce behavioural risk factors for cardiovascular disease including physical inactivity.  
2. Consumer research: Community leaders planned and tailored interventions to the needs of their community. Coalition development incorporated needs assessment.  
3. Segmentation and targeting: Intervention was targeted in low income and ethnic minority region following analysis of mortality data.  
4. Marketing mix: Education programmes, media, exercise classes, walking clubs.  
5. Exchange: Poster contests were held in schools, education programmes highlighted the benefits of physical activity such as better fitness levels.  
6. Competition: Evaluation of environmental factors was conducted, walking paths were constructed in low income communities where cost was a barrier to physical activity. | Positive effect.  
Physical activity: Physical inactivity decreased within the intervention region, that is, in communities where heart health coalitions were developed and among respondents who were aware of these coalitions. Measure: time. |
<table>
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<tr>
<th>Burke 2002</th>
<th>An Innovative Program For Changing Health Behaviours</th>
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<tr>
<td>Burke et al 2004</td>
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| 78 couples cohabiting for less than 2 years in Perth, Western Australia. |
| Community based, randomised control trial design. The intervention consisted of interactive group sessions and mail outs. |
| 1. Behaviour change goal: To increase levels of physical activity. |
| 2. Consumer research: Formative research in the form of focus groups was carried out. Pilot testing was carried out prior to intervention. |
| 3. Segmentation and targeting: Couples cohabiting for less than 2 years in Perth, Western Australia. |
| 4. Marketing mix: Mail outs, interactive group sessions. |
| 5. Exchange: Goal setting formed an important part of the intervention, |
| 6. Competition: Incorporated strategies to tackle barriers to behavioural change were a feature of the intervention. Focus was put on social support and recognition of risk behaviours. |

- Mixed results.
- Physical activity levels: Physical activity levels increased, however between group differences were not significant.
- Measure: Time.
- Psychosocial: changes for self efficacy and stage of change to physical activity were not significant.
- Physiological: Reduction in BMI, blood pressure and cholesterol levels.
<table>
<thead>
<tr>
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<th>Results</th>
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</table>
| Caballero 2003             | 1704 American-Indian children in 3rd-5th grades in 41 schools in Arizona, New Mexico and South Dakota, USA. | The school-based intervention comprised a physical activity programme supplemented by a classroom curriculum and family component. Randomised controlled trial study design. Based on social learning theory. | 1. Behaviour change goal: The intervention sought to promote and increase energy expenditure through physical activity.  
2. Consumer research: The study included a 3 year feasibility stage during which intervention components were developed and tested. Formative research was undertaken using both quantitative and qualitative methods.  
3. Segmentation and targeting: American Indian children, cultural heritage was considered during programme development.  
4. Marketing mix: Classroom curriculum, family component, physical activity classes.  
5. Exchange: Goal setting, achievement recognition.  
6. Competition: Risk behaviours (ie. sedentary lifestyle) were identified in formative research and the intervention strategy sought to target such behaviours. | Mixed Results.  
Significant increase in self reported levels of physical activity. However motion sensor measurement data indicated no significant different between intervention and control.  
Psychosocial: self efficacy to Physical activity was significantly higher in treatment group than control group. Positive effect on stage of change to physical activity.  
Physiological: No significant reduction in BMI. |
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<tr>
<td>Gans 1999 Pawtucket Heart Health Program Carleton et al 1995</td>
<td>Adults in a Rhode Island city with relatively low mean household income.</td>
<td>7-year multi-component community intervention to reduce cardiovascular risk factors. Quasi experimental design with one intervention and one comparison community. Underpinned by social learning theory, community behavioural psychology and community participation, the intervention comprised formal behaviour change programmes (including counselling and groups), grass-roots community and worksite activities, volunteer delivery, unpaid publicity, weight loss contests.</td>
<td>1. Behaviour change goal: Increase levels of physical activity. 2. Consumer research: Formative evaluation and an ongoing computer based process evaluation system feeding back into the programme. Individual programmes were pilot tested. 3. Segmentation and targeting: Targeting strategy combined individually- and community- / environmental-targeted activities. Materials were culturally relevant and designed for people with low literacy. 4. Marketing mix: Education, counselling, media, community and worksite activities, policy change. 5. Exchange: Weight loss contests including monetary incentives. 6. Competition: Programmes were designed to influence the environment in which risk factor behaviours occurred for example instillation of a multiple station exercise course.</td>
<td>Positive effect:  Physical activity: Not measured. Knowledge: Increased knowledge, identification of physical activity as a cardiovascular disease risk factor. Physiological: Reduction in CVD rates by 16% compared to control, no increase in BMI compared to increase in control to a significant level.</td>
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<tr>
<td>Intervention Name &amp; Authors</td>
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| Goodman 1995 | Randomly selected residents of the city of Florence, South Carolina, USA. | A 5 year community based chronic disease prevention programme. Quasi experimental, randomised controlled design. Intervention included media campaign, walk a thons and a speaker’s bureau. Based on an organised approach to health promotion/disease prevention. | 1. Behaviour change goal: Increase levels of physical activity.  
2. Consumer research: Co-ordinating council, surveillance system and inventory of resources conducted needs analysis.  
3. Segmentation and targeting: Intervention area targeted based on health data.  
6. Competition: Walking lanes introduced to encourage activity, targeted interventions to overcome barriers to low income participants. | No effect.  
No effect on physical activity levels. Measure: frequency.  
Physiological: The project had a slightly favourable intervention effect on cholesterol and smoking, but failed to have an effect on other risk factors for cardiovascular disease. |
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<tr>
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</table>
| Huhman et al 2005 VERB     | Targeted at children aged 9-13. National campaign in the USA with 9 communities selected for intervention, 6 of which received high dose activities: Los Angeles, Houston, Miami, Greenville, Columbus and Green Bay. | A Multiethnic media campaign combining paid advertisements with school and community promotions and internet activities to encourage children aged 9-13 to be physically active every day. Schools based, underpinned by a social marketing framework. Quasi-experimental, longitudinal design was used. | 1. Behaviour change goal: To encourage children aged 9-13 to be physically active every day.  
2. Consumer research: Extensive formative research carried out on target group and parents including focus groups, interviews and ethnographic inquiries.  
4. Marketing mix: Media, community events, promotions, educational materials in schools.  
5. Exchange: VERB sales package included benefits of physical activity such as enjoyment, spending time with friends and gaining recognition. Various events offering competitions and prizes for participation.  
6. Competition: VERB campaign’s goal was to win or gain a greater market share of time tweens spend on sedentary activities by creating an effective brand and utilising a design acknowledging competing behaviours such as watching TV, lack of transportation, cost and perceived lack of time. | Positive effect. Positive effect on physical activity levels of children who were aware of and took part in interventions. Measure: frequency. Knowledge: Positive effect on knowledge outcomes. |
<p>| Wong et al 2004 Bauman 2004| | | | |</p>
<table>
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<tr>
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<tr>
<td>Lewis 1993 (PARR) The Physical Activity For Risk Reduction Project</td>
<td>Low income residents in rental communities of the Housing Authority of the Birmingham District in Birmingham, Alabama, USA</td>
<td>A randomised controlled study, 3 year constituency based physical activity promotion programme. Used community based exercise programmes, walking and aerobic dance classes, videos, pamphlets and behaviour interventions.</td>
<td>1. Behaviour change goal: 2. Consumer research: Focus group meetings in communities, needs assessment. 3. Segmentation and targeting: Ethnic minority communities. 4. Marketing mix: Walking, aerobic classes, videos and pamphlets, group and individual instruction. 5. Exchange: Intra and inter community competitions for structured participation. Participants taught advantages of health and job related fitness. 6. Competition: Intervention designed by taking into account barriers to physical activity identified in formative research, for example arranging group childcare.</td>
<td>Mixed Results:  Physical activity levels: The pre and post intervention physical activity scores were not significantly different in intervention communities. However physical activity levels did increase in intervention communities, with higher increases among young people and women.</td>
</tr>
<tr>
<td>Intervention Name &amp; Authors</td>
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| Luepker 1994                | Adults in six communities in Minnesota, USA | 5-year community intervention to reduce cardiovascular risk factors (smoking, cholesterol, blood pressure, physical activity). Controlled, quasi experimental, cross sectional and cohort survey design. Underpinned by social cognitive theory and community participation, the intervention comprised community organisation, citizen taskforces, mass media, educational programme delivered through health centres, professional education (eg. of physicians, nutritionists and other health professionals) and youth education through schools, youth clubs and children’s events and community-based activities. | 1. Behaviour change goal: The intervention sought to reduce the risk of cardiovascular disease by improving exercise behaviours (along side other components). Aimed to increase physical activity and reduce sedentary behaviour.  
2. Consumer research: Intervention components were based on different formative work such as telephone surveys and needs assessment surveys.  
4. Marketing mix: Community organisation, media, training, classes, policies.  
5. Exchange: The intervention included economic incentives and the school programme employed goal setting.  
6. Competition: The school programme included teaching children to resist health compromising behaviours and taught skills to resist pressures. | Mixed results.  
Physical activity levels: Steady increase in self reported physical activity levels over duration of intervention. Small increase in kcal per day expended in physical activity in early years, small decrease in later years. Measure: frequency and kcal expended.  
Physiological: No significant changes in blood pressure, BMI or Cholesterol level. |
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<tr>
<td>Luepker 1996</td>
<td>A total of 5106 third grade students from 56 intervention and 40 control elementary schools located in California, Louisiana, Minnesota and Texas, USA.</td>
<td>Intervention to improve diet and physical activity among school students. Multi centre field trial with cluster units, randomised controlled trial design. The 2 year intervention included both school based and family based components, including class curricula, physical activity classes, home activities programme, family fun night. Based on organisational change and social cognitive theory.</td>
<td>1. Behaviour change goal: To increase daily vigorous physical activity.</td>
<td>Positive effect. Intensity of physical activity in PE classes increased significantly in intervention compared to control. Intervention students reported significantly more daily vigorous activity than controls (58.6 vs. 46.5 minutes) Measure: Time.</td>
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<tr>
<td>(CATCH) The Child And Adolescent Trial For Cardiovascular Health</td>
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<td>2. Consumer research: The overall programme was developed from a body of research that tested theory based methods. Limited empirical data informed the development of the intervention.</td>
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<tr>
<td>Stone et al 1996</td>
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<td>5. Exchange: Rewards, prizes and incentives formed a part of intervention activities. The programme included motivation by targeting anticipated outcomes of behaviour.</td>
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<td>6. Competition: Children received training in perceptions of threats and coping procedures. The intervention addressed self regulatory processes including self monitoring as part of the education programme.</td>
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| Matsudo 2002 | Residents of the city of Sao Paolo, Brazil. | A multi-level community wide intervention designed to promote physical activity in the Brazilian city of Sao Paolo. Activities were encouraged in three settings: home, transport and leisure time. Based on the Trans-theoretical model, Social Cognitive Theory and community planning for partnership and health promotion. Uncontrolled. | 1. Behaviour change goal: To promote physical activity by increasing knowledge about the benefits and the level of physical activity.  
2. Consumer research: Needs analysis, formative research, and use of baseline data.  
3. Segmentation and targeting: Students, the elderly and workers.  
4. Marketing mix: Educational materials, media exposure, mega events, gala days, active worker days.  
5. Exchange: Events and Gala days offered rewards for participation, emphasis on benefits of physical activity outlined in materials, pyramid system of desirable behaviours circulated.  
6. Competition: Intervention design accounted for lack of time by encouraging brief sessions, moderate intensity physical activity was recommended to account for climate. | Positive effect.  
Physical activity levels: Positive effect. Measure: time.  
Positive effect on knowledge levels: positive effect on knowledge of physical activity benefits and risk behaviours. |
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| **Nader 1992** San Diego Family Health Project | 24 Anglo, Black and Mexican-American families of young elementary school children, in the city of San Diego, California, USA. | School based randomised controlled field trial. Intervention comprised a 3 month cardiovascular disease risk reduction education project to increase frequency of aerobic exercise. Based on cognitive social learning theory. | 1. Behaviour change goal: Increase frequency of aerobic exercise.  
2. Consumer research: Formative research was undertaken.  
3. Segmentation and targeting: Mexican American, Black and Anglo American families. The intervention was culturally sensitive (eg. use of bilingual speakers)  
4. Marketing mix: Educational programme, group sessions, training for graduate students running the intervention  
5. Exchange: Extrinsic rewards such as tickets to events were offered for full participation and self monitoring; contests ran in newsletters, emphasis made of benefits such as physical well being, improved appearance, pride in achievement, increased confidence.  
6. Competition: Potential barriers to achieving goals were identified and ways were identified which minimised changes in person’s usual habits. | Mixed Results  
No effect on levels of physical activity: ANOVA analysis showed no main effects in reported minutes of exercise. Measure: Time.  
Positive effect on knowledge: Experimental group exceeded control group for knowledge scores at post test.  
Physiological: No significant effect on blood pressure.  
Psychosocial: Significant change in social support for physical activity. |
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| Neiger 2001
 *Social Marketing For Public Health Employees* | 205 Public health employees in Utah, USA. | Quasi experimental design, with a pre-test post-test format with primary and secondary treatment groups. Ten week social marketing intervention comprising the following communications and promotions, ongoing activities, one off events and environmental changes. | 1. Behaviour change goal: The intervention sought to increase physical activity levels.  
2. Consumer research: Comprehensive formative research was undertaken, including an interest survey, focus groups, in depth interviews and pre-testing.  
3. Segmentation and targeting: Public health employees  
4. Marketing mix: The intervention comprised communications and promotions including posters, public announcements, events, and ongoing activities.  
5. Exchange: Challenges, leave granted for successful groups, recognition: pat on the back ceremony.  
6. Competition: Activities were designed from formative research data to reduce reported barriers. | Positive effect.  
Pre-test to post-test differences were noted in primary treatment group on three levels of physical activity. Application of the intervention was generally effective at increasing physical activity levels. Measure: frequency.  
Psychosocial: Self efficacy scores on physical activity showed significant differences between primary and secondary groups. Support from friends and family also showed significant differences. |
### Physical Activity Interventions: Social Marketing Characteristics

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| Neumark-Sztainer 2003             | 89 girls in the intervention group and 122 in control group taken from six schools in the Twin Cities (Minneapolis-St Paul) district of Minnesota, USA. | Multi-component, school based obesity prevention programme, randomised controlled study design. Based on social cognitive theory. The intervention incorporated a class based curriculum, physical activity classes, instruction and education packs. | 1. Behaviour change goal: Increase levels and awareness of physical activity.  
2. Consumer research: Needs assessment was conducted and formative research including a survey and focus groups were conducted.  
4. Marketing mix: Classroom curriculum, physical activity classes, exercise logs, guest instructors, information packs, policy change.  
5. Exchange: Participants offered school credits for completing programmes  
6. Competition: Formative research identified barriers to change such as discomfort with physical education classes. Addressed barriers such as transportation costs and lack of time by incorporating intervention components into school day activities. | Mixed Results  
Level of Physical activity: No significant difference. Measure: time  
Psychosocial outcomes: Progression in state of behavioural change.  
Physiological outcomes: BMI no significant differences. |
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<td>O’Loughlin 1999</td>
<td>Adults in a low income inner city neighbourhood in Montreal, Quebec, Canada.</td>
<td>4-year community programme to reduce cardiovascular risk factors (smoking, diet, blood pressure, physical activity). Randomised, controlled design. Underpinned by social learning theory and behaviour change theory and community participation, the intervention included, direct mail, a walking club, distribution of videos, mass media, workplace workshops</td>
<td>1. Behaviour change goal: To promote heart-healthy behaviours including physical activity. 2. Consumer research: Needs analysis, focus groups, in-depth interviews, pilot testing. 3. Segmentation and targeting: Components tailored to low income population. Some activities specifically targeted at women. 4. Marketing mix: Walking clubs, workplace workshops, direct mail, and media. 5. Exchange: The intervention included workplace workshops using a motivational approach, walking club included provision of t-shirts and a certificate for participation 6. Competition: Workshops aimed to help people identify the social and commercial pressures to lose weight and to develop a long term commitment to physical activity. Walking club was developed in response to concerns that few low cost opportunities for physical activity were available to women.</td>
<td>No effect: Physical Activity Levels: No statistically significant program effects detected, physical inactivity increased in both intervention and control communities. However physical inactivity increased more in comparison community than in St-Henri. Measure: frequency.</td>
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| Prochaska 2004        | 138 teenagers from a middle school in San Diego, California, USA.        | 4 month intervention. The intervention comprised an interactive computer program that was completed before a meeting with a health professional. Randomised control trial design. Based on social cognitive theory, trans-theoretical model and relapse prevention model. | 1. Behaviour change goal: The intervention sought to increase levels of physical activity.  
2. Consumer research: Prototypes of the programme were tested for usability. Focus groups were held with teenagers and other audiences.  
3. Segmentation and targeting: Teenagers, the programme also used individual tailoring.  
4. Marketing mix: Interactive computer programme and encounter with health professional, telephone calls and mail out information packs.  
5. Exchange: Action plans identified the benefits of making changes such as increased fitness levels.  
6. Competition: Relapse prevention plans were included that included strategies for reducing barriers to behaviour change. | No effect.  
No self reported improvement in levels of rigorous physical activity. Measure: time.                                                                                                                                                                                   |
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<tr>
<th><strong>Puska 2002</strong></th>
<th>Residents of the North Karelia region of Finland.</th>
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<td><strong>North Karelia Project</strong></td>
<td>A 25 year community based project to prevent cardiovascular disease, physical activity element introduced after 10 years on project. Based on social learning theory, innovation diffusion theory, communication perception model, hierarchical communication model and trans-theoretical need. No control, non randomised design.</td>
</tr>
<tr>
<td><strong>Puska et al 1983</strong></td>
<td>1. Behaviour change goal: Increase levels of leisure time physical activity as part of overall target to reduce levels of cardiovascular disease.</td>
</tr>
<tr>
<td><strong>Puska et al 1995</strong></td>
<td>2. Consumer research: - Population and health personnel surveyed about problems and about the possibilities of solving them. Information was gathered about the community leadership and social interaction structure in the community. Some pre-testing in small communities prior to regional roll out.</td>
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<td>3. Segmentation and targeting: Targeted at high risk region based on health data, various interventions targeted specific groups such as middle aged men and youth groups.</td>
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<td>4. Marketing mix: Media campaigns, fitness classes, training of health and other professionals, policy change.</td>
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<td>5. Exchange: Messages about benefits of improved fitness communicated to participants, physical activity competitions held.</td>
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<td>6. Competition: Formative research addressed barriers to participation, interventions designed to address these barriers.</td>
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<td>Positive effect. Physical effect on physical activity levels. Over the intervention period leisure time physical activity levels increased.</td>
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<td>Physiological: Overall 75% reduction in annual mortality rate of coronary heart disease in working population of region. Significant reduction in cholesterol levels.</td>
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<td><strong>Reger 2002</strong>&lt;br&gt;<strong>Wheeling Walks</strong></td>
<td>50-65 year old adults in the city of Wheeling, West Virginia, USA</td>
<td>A community based campaign to promote walking among sedentary 50 to 65 year old adults. Quasi-experimental design with control group. Communication intervention used theory of planned behaviour and trans-theoretical model constructs to change behaviour by promoting daily walking through paid media, public relations and public health activities.</td>
<td>1. Behaviour change goal: To promote 30 minutes of daily walking.&lt;br&gt;2. Consumer research: Pre-testing, formative qualitative and quantitative research.&lt;br&gt;3. Segmentation and targeting: Targeted at sedentary 50 to 65 year old adults.&lt;br&gt;4. Marketing mix: Media, public relations activities, a campaign website, public health education programmes, work site programmes.&lt;br&gt;5. Exchange: A worksite wellness walking challenge was held in the intervention community with incentives for participation.&lt;br&gt;6. Competition: Intervention design addressed barriers to physical activity such as perceived lack of time and scheduling.</td>
<td>Positive effect on physical activity levels.&lt;br&gt;Physical activity levels: Behaviour observation and self reporting showed small positive effect. Measure: frequency and time.&lt;br&gt;Psychosocial: positive effect on stage of change for physical activity.</td>
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<td>Resnicow 2000 &lt;br&gt; <strong>GO GIRLS!</strong></td>
<td>57 low income overweight African American girls aged 11-17 in USA.</td>
<td>Community based. Uncontrolled before and after study design, comparing outcomes for high and low attendees. Based on social cognitive theory. The intervention comprised of sessions of interactive educational/behavioural activity, information packs and physical activity classes.</td>
<td>1. Behaviour change goal: Intervention sought to increase levels of physical activity. 2. Consumer research: Focus groups were conducted with the target audience. 3. Segmentation and targeting: Female, low income overweight African American teenagers. 4. Marketing mix: Posters and flyers, educational component, physical activity classes, information packs. 5. Exchange: Incentives such as t-shirts and financial rewards offered for full participation. Points system used in which points could be exchanged for rewards. Groups taken on outdoor retreat days. 6. Competition: Wide range of physical activities was used to allow participants to choose something that they enjoyed and could fit in to their lifestyles. Participants also taught relapse strategies and risks of sedentary behaviours.</td>
<td>No effect. Physical activity levels: No significant differences were found for levels of physical activity between high and low attendees (no control group). Measure: frequency, time, kcal. Psychosocial: Reported more social support from friends and family for making exercise changes. No significant difference in self efficacy for physical activity scores. Physiological: no positive effect on BMI and other measures.</td>
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| Sallis 2003 (M-SPAN) The Middle School Physical Activity And Nutrition Study | Pupils of 24 public middle schools in San Diego County, California, USA. | School based physical activity interventions over 2 years, designed to increase physical activity in physical education classes and throughout the school day. Randomised control trial design. Based on a structural, ecologic model of health behaviour. | 1. Behaviour change goal: Increase the total energy expenditure from physical activity by the student population at school.  
2. Consumer research: Baseline data was used to inform the development of the intervention.  
4. Marketing mix: The intervention comprised monthly peer led educational sessions, reminder telephone calls and pamphlets, policy change.  
5. Exchange: Behaviour reinforcing incentives were used. Key reasons to attend sessions were emphasised in mail outs. Activity equipment was made available to students.  
6. Competition: Intervention components were designed to increase physical activity during leisure periods throughout the school day giving pupils choices. Policy changes were made to make more activity areas accessible. | Positive effect.  
Physical activity levels: Randomised regression models revealed a significant intervention effect for physical activity for the total group and boys but not girls. Measure: time, kcal.  
Physiological: Survey data indicated that the interventions reduced reported body mass index for boys. |
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<td>Story &amp; Sherwood 2003 (GEMS) The Girls Health Enrichment Multi-Site Studies</td>
<td>54 African American girls aged 8-10 in after school community program in Minnesota, USA.</td>
<td>Community Based after school obesity prevention programme. 12 week two arm parallel group randomised controlled pilot study design. The after school intervention was conducted twice a week for 12 weeks and focused on increasing physical activity and healthy eating. A family component was also included. Based on social cognitive theory.</td>
<td>1. Behaviour change goal: To prevent obesity by increasing levels of physical activity. 2. Consumer research: Extensive formative assessment including focus groups. 3. Segmentation and targeting: African American girls aged 8-10 with a certain range of Body Mass Index. 4. Marketing mix: Child targeted programmes (group sessions and activities), parent programmes, events, summer camp, internet based intervention. 5. Exchange: Small gifts and incentives offered for continued participation, goal setting. 6. Competition: Recognised potential influence of family members, social support to address barriers through buddy system.</td>
<td>Mixed results: Physical activity levels: Physical activity measures demonstrated consistently greater activity levels in the intervention than the control. Measures: Time. Psychosocial: showed no significant improvement in self efficacy for Physical activity scores in treatment group. Physiological: No significant effect on BMI.</td>
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