Psychology, Health & Medicine

ISSN: 1354-8506 (Print) 1465-3966 (Online) Journal homepage: https://www.tandfonline.com/loi/cphm20

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To cite this article: Rachele Dale & Andria Hanbury (2010) A simple methodology for piloting and evaluating mass media interventions: An exploratory study, Psychology, Health & Medicine, 15:2, 231-242, DOI: 10.1080/13548501003623971

To link to this article: https://doi.org/10.1080/13548501003623971

Psychology, Health & Medicine
Vol. 15, No. 2, March 2010, 231–242

Routledge
Taylor & Francis Group

A simple methodology for piloting and evaluating mass media interventions: An exploratory study

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(*Received 19 November 2009; final version received 13 January 2010*)

To develop effective mass media health campaigns it is important to explore the behaviour-change techniques that make campaigns more or less effective. This exploratory study observed the behaviour-change techniques employed in two current healthy eating television programmes, and mapped these techniques onto key theoretical frameworks. Interviews were then conducted with six participants who watched the programmes, to identify which techniques were perceived to be more and less effective and to identify any disjunctures between the behaviour-change techniques used in the programmes and factors perceived by the participants to be particularly influential upon their healthy eating. The two programmes were found to use similar behaviour-change techniques, with a heavy reliance on providing general health motivation. Interviews revealed that participants perceived several specific barriers to eating healthily, felt the need for more specific guidance and emphasised the importance of identifying with the role models used in the programmes. Recommendations for future mass media health campaigns include the need to educate individuals about how to overcome specific barriers that they might face when trying to eat a healthy diet and to include a wider range of role models to encourage the audience to identify with the programme participants.

Keywords: mass-media; healthy eating; piloting; process evaluation; observation; qualitative

Introduction

Being overweight or obese can lead to serious health consequences and is a major risk factor for chronic diseases such as, heart disease, stroke, type 2 diabetes, arthritis and some cancers (World Health Organization, 2006). However, despite these serious health consequences, in the UK rates of obesity are on the increase with estimates suggesting that if no action is taken more than one million adults and one million children will be obese by 2010 (National Institute for Health and Clinical Excellence, 2006). The aetiology of obesity remains poorly understood. Whereas genetic factors and metabolic abnormalities may account for a small proportion of the energy imbalance leading to obesity, it is believed that much is attributable to

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ISSN 1354-8506 print/ISSN 1465-3966 online

DOI: 10.1080/13548501003623971
http://www.informaworld.com

lifestyle, with poor dietary choices and low physical activity the key behaviours implicated in the aetiology of weight gain (Ball & Crawford, 2006). Persuading people to take exercise and to eat a healthy diet has the potential to improve population health.

Small-scale interventions and localised campaigns aimed at helping individuals make life-style changes may be insufficient (Hornik & Kelly, 2007). In 1998, the World Health Organization suggested that the mass media could play an important role in reducing rates of obesity through promoting healthy diets and exercise. One formal mass media campaign which successfully targeted people's exercise and dietary behaviours was the BBC's 'Fighting Fat, Fighting Fit' (FFFF) campaign (Miles, Rapoport, Wardle, Afuape, & Duman, 2001). This campaign was designed to inform people about the need for active obesity prevention and to educate and encourage people to eat more healthily and become more physically active. A survey of 6000 randomly selected campaign registrants (made up of individuals aged 21–45) was carried out at the start of and after the end of the campaign. This survey measured dietary intake, activity levels, weight and height measurements, psychological well-being, emotional eating behaviour and involvement in the FFFF campaign. After the campaign, 39% of the participants reported increasing their physical activity levels, 44% reported losing weight and the number of participants who reported eating the recommended five portions of fruit and vegetables a day increased by 13% (Miles et al., 2001). A current formal mass media health campaign is the 'Change 4 Life' campaign, supported by the Department of Health. This campaign includes television and radio advertisements, posters, leaflets, a website and free or subsidised local physical activity sessions. The aim of this campaign is to encourage everyone in England to make changes to their diet and activity levels in order to reverse the growing trend of obesity and obesity-related illnesses (Department Of Health, 2009). In addition to these formal mass media health campaigns, current television programmes which focus on educating their participants about healthy eating may also have the potential to educate their audiences and influence people's health behaviours. Such television programmes present the potential for the audience to learn the health messages and change their dietary behaviours vicariously through watching the programme participants being educated about and changing their diets.

An important element in the design of any health behaviour-change intervention is the use of theory to inform intervention design (Noar, 2006). The development of theory-based behaviour-change interventions is a complex process, with decisions required regarding intervention objectives, which behaviour-change techniques to use, selection of suitable intervention materials and activities, delivery modes and implementation issues (Bartholomew, Parcel, Kok, & Gottlieb, 2006). Currently there is a lack of sound evidence-base to guide researchers in the development of theory-based interventions (Michie et al., 2008), with reports of interventions typically lacking the necessary detail regarding the intervention design. This makes replication difficult and hampers the development of a knowledge-base developing regarding what behaviour-change theories and techniques might be effective in a given context (Abraham & Michie, 2008; Bartholomew et al., 2006). Abraham and Michie (2008) developed a taxonomy of behaviour-change techniques, linked to theory, which can be used to describe intervention designs using a common language. Using this taxonomy could help researchers identify through comparison across studies which behaviour-change techniques are associated with more and less

successful interventions in a given context or behavioural domain (Abraham & Michie, 2008).

Given the weak evidence-base available to guide intervention developers, performing a process evaluation has been recommended (Craig et al., 2007; Shaw et al., 2005). Process evaluation encompasses providing a detailed description of the behaviour-change intervention, monitoring of participants' exposure to the intervention and exploring the experience of participants exposed to the intervention (Hulscher, Laurant, & Grol, 2003). For mass media, as well as for other types of behaviour-change interventions, it is particularly important to explore how the audience uses and perceives information provided in interventions, and whether they feel that it is relevant to them (Fitzgibbon et al., 2007). This information can be used to revise and improve the intervention by identifying the influential components of an intervention, as perceived by the participants who have experienced it (Hulscher et al., 2003). Indeed, recommendations have been made for researchers to use more exploratory and qualitative research methods to pilot and model intervention components prior to embarking on costly and definitive randomised controlled trials to test intervention effectiveness (Hanbury et al., 2009; Medical Research Council, 2000; Craig et al., 2008). This process of piloting intervention components can help identify which are the most influential components of an intervention, which groups of participants are most likely to respond positively to the intervention and whether the intervention must be modified in different ways for different groups (Medical Research Council, 2000; Craig et al., 2008).

To explore what components of a mass media health campaign are likely to be effective at changing dietary behaviour, and to identify recommendations for the refinement of such interventions, this exploratory study presents a simple methodology that can be used for piloting mass media interventions. The study aims to identify the behaviour-change techniques employed in two current healthy eating television programmes, and map these techniques onto key theoretical frameworks using an observational schedule. Using qualitative methods, this study then aims to explore the experiences and perceptions of individuals who have watched these programmes, identifying which components were perceived to be most influential, as well as to identify any disjunctures between the content of the programmes and factors perceived by the participants as being particularly influential on their dietary behaviours. Television programmes are used within this current study as a practical substitute for mass media health campaigns as a way of exploring the potential of these campaigns. Recommendations will be made for the design and refinement of future formal and informal mass media interventions.

Method

This study comprised two phases. In phase 1 an observational study was conducted to identify the behaviour-change techniques employed in two different healthy eating television programmes. In phase 2, qualitative interviews were performed with a sample of participants who watched the programmes. The interviews were designed to explore the experiences and perceptions of those who watched the programmes, identifying which aspects of the programmes were perceived to be more and less effective, as well as identifying any disjunctures between the content of the programmes and factors perceived by the participants to influence their dietary

choices. Ethical approval was granted from a university ethics committee, with informed consent gained from all participants who took part in phase 2.

Phase 1 – observational study

One episode from two current healthy eating television programmes was selected on the criteria of using a female role model, containing a range of health information, demonstrating a behaviour change in the person used as a role model in the programme, and not containing any information which may distress the participant. Programme 1 used two role models, a mother and son, and demonstrated them changing their unhealthy eating behaviours and adopting a healthier lifestyle through diet and exercise. Programme 2 used a female role model, suffering from a range of health complaints and demonstrated that as the role model adopted healthier eating habits and exercise, she improved her health.

Development of the observational criteria

The observational schedule comprised eight behaviour-change techniques: providing general health motivation, providing information on how to overcome barriers, focussing on the benefits of changing behaviour, encouraging formation of implementation intentions, use of role modelling, emphasising positive subjective norms, identifying cues to action and developing personal mastery. The behaviour change techniques can be mapped onto overlapping constructs from five key models of health behaviour change. These models are the health belief model (HBM) (Rosenstock, 1974), the theory of planned behaviour (TPB) (Ajzen & Fishbein, 1980), the transtheoretical model (TTM) (Prochaska & DiClemente, 1983), social cognitive theory (SCT) (Bandura, 1986) and implementation intentions (Gollwitzer, 1993). A definition was developed for each technique to guide the researcher when coding specific examples observed in programmes 1 and 2. The techniques used in the observational criteria, the constructs and theoretical frameworks that they can be mapped onto and the definitions of these techniques are summarised in Table 1.

Procedure

The observational criteria were applied to one episode of each programme, with the researcher additionally noting examples of how the programmes had used certain behaviour-change techniques. The data were then arranged into a frequency table. A Pearson Chi-Square test was performed to identify if there was any significant difference in use of behaviour-change techniques between the two programmes.

Phase 2 – qualitative interviews

Participants

Six female university students took part in this phase of the study and were randomly allocated to watch either programme 1 or 2. Emma, Ann and Daisy were allocated to watch programme 1 and Hazel, Sam and Liz were allocated to watch programme 2. Pseudonyms are used throughout.

Table 1. Behaviour change techniques used in the observational criteria.

Behaviour-change technique	Related theoretical constructs (and frameworks)	Definition
Providing general health motivation	General health motivation (HBM), attitudes (TPB)	General information about behavioural risk, perceived susceptibility/severity to poor health outcomes or mortality risk in relation to the behaviour.
Providing information on how to overcome barriers	Cons of changing (TTM), perceived behavioural control (TPB)	Barriers to performing the behaviour and ways of overcoming them, e.g. time constraints.
Emphasising the benefits of changing behaviour	Perceived benefits of the health behaviour (HBM)	Benefits of performing the behaviour and material rewards that are explicitly linked to achieving the specified behaviour.
Providing cues to action	Cues to action (HBM)	Cues that can be used to remind individuals to perform the behaviour, including times of day or symptoms.
Encouraging formation of implementation intentions	Implementation intentions	Encouraging individuals to decide to act or set a general goal, detailed planning of what the person will do including a definition of the behaviour specifying frequency, intensity or duration and specification of where, when, how or with whom.
Use of role modelling	Perceived behavioural control (TPB)	Demonstration of how to correctly perform behaviour, for example in a class or on video.
Emphasising positive subjective norms	Subjective norms (TPB), social influence (HBM), helping relationships (TTM)	Information about what important others think about the behaviour and whether others will approve/disapprove of any proposed behaviour change.
Developing personal mastery	Self-efficacy (SCT)	Breaking down behaviours into do-able chunks in order to make the behaviour easier for the individual to accomplish, thus providing information about actual capabilities and giving individuals' the confidence that they can perform bigger steps.

Development of the interview schedule

A semi-structured interview schedule was developed to explore participants' experiences of healthy eating, and their perceptions of the healthy-eating television programme that they had watched.

Procedure

Participants were left to watch the television programme. Once the television programme had finished the semi-structured interview was conducted. The interviews lasted approximately 30 minutes and were audio-taped before being transcribed verbatim.

Data analysis

The transcripts were analysed using interpretative phenomenological analysis (IPA) (Smith, 2004). IPA aims to explore in detail the personal experience of participants and how participants make sense of that personal experience. Due to its focus on personal meanings and experience, IPA was considered as a suitable method for conducting the process evaluation, exploring which components of the television programmes were perceived to be more and less effective by individual members of the audience and exploring any disjunctures between the content of the programmes and factors perceived by the participants as being particularly influential on their own dietary behaviours. The analysis occurred in four stages. First, the interview transcriptions were read for meaning, and initial reflections and observations were made. Second, themes found in the interviews were identified and coded. The researcher analysed each interview separately before looking for the emergent themes. Third, the themes found in the interviews were structured into clusters on the basis of a common theme or relationship. Finally these clusters were then labelled, arranged into superordinate and subordinate themes and then structured into a summary table illustrated with examples from the interviews. During this stage any themes which did not appear relevant or which were very subordinate were dropped or combined into other themes where possible.

Results

Phase 1 – observational study

The frequency of behaviour-change techniques, observed in programmes 1 and 2, is summarised in Table 2.

Both healthy eating television programmes were very similar in their use of behaviour-change techniques. A Pearson chi-square test for independence indicated that there was no significant association between the programme (1 or 2) and the frequency with which the behaviour-change techniques were used, χ^2 $(1,\ N = 218) = 7.594,\ p > 0.05$. The behaviour-change techniques used most frequently in both programmes, respectively were providing general health motivation (27.6%, 30.1%), emphasising the benefits (15.2%. 20.4%) and providing cues to action (18.1%, 15.9%). These three techniques made up 63% of the total techniques observed within these two healthy eating programmes. In example, in

Table 2. Behaviour-change techniques observed in programmes 1 and 2.

Behaviour change technique	Programme 1: frequency (%)	Programme 2: frequency (%)	Observed examples
Providing general health motivation	29 (13)	34 (15.6)	Presenter highlighted amount of hidden sugar in a tablespoon of tomato sauce (programme 1)
Providing information on how to overcome barriers	18 (8.3)	11 (5.0)	Role model identified snacking on chocolate as a barrier to losing weight (programme 2)
Emphasising the benefits of changing behaviour	16 (7.3)	23 (10.6)	Role models identified going to the gym as helping them to lose weight and as increasing their self-esteem and confidence (programme 1)
Providing cues to action	19 (8.7)	18 (8.3)	Presenter displayed the role models weekly intake of unhealthy food on a table and described the heath consequences of eating bad diet (programme 1)
Encouraging formation of implementation intentions	7 (3.2)	10 (4.6)	Presenters drew up an exercise plan for the role model involving walking 10,000 steps every day (programme 2)
Use of role modelling	11 (5)	9 (4.1)	Presenter demonstrated to the role models how to cook healthy meals (programme 1)
Emphasising positive subjective norms	3 (1.4)	1 (0.5)	Role model identified husband and son as motivators for changing diet (programme 2)
Developing personal mastery	2 (0.9)	7 (3.2)	Presenter demonstrated how the male role model could quickly make a healthy breakfast (programme 1)

programme 1, the providing general health motivation technique (defined in the observational schedule as ''general information about behavioural risk, perceived susceptibility/severity to poor health outcomes or mortality risk in relation to the behaviour'') was observed when the presenter highlighted the amount of hidden sugar found in a tablespoon of tomato sauce. In programme 2, for example, the technique of emphasising the benefits (defined in the observational schedule as ''benefits of performing the behaviour and material rewards that are explicitly linked to achieving the specified behaviour'') was observed when the presenters compared the ''before'' and ''after'' photos of the role model and her health problems which showed a significant improvement.

Phase 2 – interview

Four themes emerged from the interviews. These were: (1) Perceived resource and social demands act as barriers to healthy eating, (2) Positive incentives needed to eat

a healthy diet, (3) Getting the balance right: providing specific *versus* general information and (4) Identifying with the role model. The first two themes are concerned with the participants' own experiences of healthy eating, whilst the last two themes are concerned with specific feedback on the television programmes that the participants had watched.

Theme 1: perceived resource and social demands act as barriers to healthy eating

Throughout the interviews the participants identified several specific barriers which they considered would prevent them from eating healthily, exercising and from following the information provided in the programme that they had watched. Liz identified the amount of time that it takes to prepare healthy food as a difficulty for her:

> I just find it hard work sometimes ... trying to cook something healthy especially because a lot of it is about ... it's the preparation time that it takes whereas if you just get something out of the freezer you stick it in the oven and it takes 20 minutes. Whereas if you do something from scratch it might take 20 minutes to cook but it is also going to take 20 minutes preparation time.

For Emma and Anne, the cost of eating healthily and taking regular exercise were considered to be barriers to adopting a healthier lifestyle:

> Well I can't afford to go to the gym, like gym memberships and stuff are so much! (Emma)

> It is getting all the fresh veg as well ... sometimes it seems a bit expensive when you buy all that veg (Anne)

Social influences were also identified by participants as a barrier to eating healthily, as illustrated by Sam first, then Emma:

> He came in with great big ... Swiss things, round and with custard in ... He came in with a big tray of them and he is saying, 'Go on! Have one, have one, no, you must have one!' you know and you're saying 'No! I'm on a diet' and people look at you as if to say, 'Well it'll not hurt you just one'. So, I succumbed and I had one but all day I had this guilt trip, you know that I shouldn't have eaten that and I shouldn't have eaten it! (Sam)

> Since I started going out with David it's like, he eats loads ... he's like 'oh shall we get a takeaway?' ... or like if he makes the tea, he'll do like, the same portion size that he would eat, and then you find yourself like ... you know like, because he has made so much effort trying to make the tea ... I want to try and eat it ... But, yeah I think I have started eating a lot more ... spending a lot of time with David then I start to eat really badly (Emma)

Theme 2: positive incentives needed to eat a healthy diet

The participants identified several incentives which may motivate them to eat a healthy diet. For Sam, having a goal to aim for was an incentive for her to eat a healthy diet:

> Yeah, you've got to have; you've got to have the willpower and the desire to do that. Like, erm, if you think that you are going somewhere and you want a special outfit or you're going on holiday you've got a ... what's the word I'm looking for? You've got a ... A goal to aim for.

However, for Hazel an important incentive to eat a healthy diet is looking after yourself as you get older:

> As you are getting older, you need to be looking at … at looking after yourself more, I mean you need to look after yourself when you're younger but the older you get, you're more prone to certain things really, like heart disease and arthritis.

Theme 3: getting the balance right: providing specific versus general information

The participants identified two pieces of information from programme 1 as information that they would be likely to follow. The first piece of information that stood out to the participants was an emphasis on the importance of reading the labels on foodstuffs. For Daisy, reading labels was seen as important in order to discover whether foodstuffs have hidden sugar or fat:

> Yeah and I think that the lady that was saying about all the ready meals and stuff that have all the hidden, that don't always tell you about how much sugar and fat that is in them.

However, although the programme emphasised the importance of reading food labels it did not educate the viewer as to what information they should be looking for and food labels were felt to be confusing or misleading. Emma identified reading food labels as something that she would like to do but she also thought that she might struggle to understand the information on food labels:

> That woman said that she had started like, checking, erm … the labels on stuff … I think that is a good thing, if you can pick that up from it … But, I'd just look at it and I wouldn't have a clue!

The second piece of information that stood out to the participant's was the use of a table displaying the role models weekly food intake of unhealthy food. For Ann and Emma, this display would make them consider their own food intake:

> When she spreads all that stuff out on that table that is the biggest influence I think. Is to know exactly how much there is in a week, you don't realise … meal by meal it never ever adds up meal by meal, or even day by day. You have to do a full week to see exactly. (Ann)

> When she was like adding up all the stuff that he eats and doing that table of everything that he eats, I started thinking, like, God, I wonder like, what my table would look like, and if like she would be really disgusted by what I eat and stuff. (Emma)

Theme 4: Identifying with the role model

It was acknowledged by the participants that watching the healthy eating programmes could be useful for learning about healthy eating. However, it was also thought that the effects of the programmes would not last very long and that the advice provided would be forgotten about in the long term. One reason for the programmes not having long lasting affects could be the individual's perception of the relevance of the programme to them. Daisy felt that the role models provided in the programme had a really bad diet and she felt that this was not a true reflection of her diet or the problems that she personally faced when trying to eat a

healthy diet, whilst Emma emphasised the significance of identifying with the role models:

> I think it is quite specific maybe to those people in the programme and obviously their diet was really bad ... And I wouldn't consider my diet to be like theirs ... I try to eat quite healthily so I don't think that I would have to be as extreme. (Daisy)

> It is going to make you think a bit more about your diet and monitor more what you are eating and if it is like as bad as, like, those people in the programme, then you are going to start thinking about like, erm, changing your own diet. (Emma)

Discussion

This exploratory study observed the behaviour-change techniques employed in two current healthy eating television programmes, mapped these onto key theoretical frameworks, and asked participants who had watched the programmes for their feedback on which components of the programmes they perceived to be most and least effective. This study also explored whether there are any disjuncture's between participants' experiences of healthy eating and what the programmes focussed upon. This methodology is suggested as a simple and cost effective way of piloting mass media interventions in order to identify which components are likely to be most effective, and to identify any necessary refinements to them. Use of exploratory and qualitative methods has been recommended by the Medical Research Council (2000, 2008) prior to developing costly and more definitive trials of interventions, and the piloting of intervention materials has been recommended as part of the intervention mapping process (Bartholomew et al., 2006).

In phase 1 of the study, the two television programmes were found to be very similar with reference to the behaviour-change techniques that they employed. It was found that providing general health information, emphasising the benefits of adopting a healthier lifestyle and providing cues to action were the most commonly used techniques. This finding indicates that the TPB (Ajzen & Fishbein, 1980) and the HBM (Rosenstock, 1974) are the two theories most commonly underlying these two healthy eating programmes, and suggests a reliance on providing more general information about healthy eating to the audience. However, in phase 2 when participants discussed their own experiences of health eating, participants discussed specific barriers perceived as preventing them from healthy eating, notably perceived demands on time and money, as well as social influences, such as friends and family encouraging them to eat unhealthy foods. This indicates a possible disjuncture between the general health information provided in the programmes and the specific information required by the participants to overcome commonly perceived barriers to eating a healthy diet. Future mass media health campaigns could be made more effective by providing specific advice on how to address these commonly perceived barriers to eating healthy (TTM and TPB), and through trying to develop personal mastery (SCT) in the audience members to overcome these perceived barriers. Future mass media interventions could also emphasise positive subjective norms around healthy eating (TPB, HBM, TTM) to target the negative influences of friends and family. Techniques based on subjective norms and personal mastery in particular were rarely used in either of the two programmes.

When discussing the programmes, an influential aspect of one of the programmes was considered to be the displaying of the programme participants' weekly food intake on a table. The participants considered this to act as an incentive for

monitoring their own food intake, suggesting use of such incentives, for example, in the form of food diaries, to be a potentially effective strategy. However, it emerged from the interviews that the participants felt that they also need to set personal goals to act as an incentive for their healthier eating. This suggests that future mass media health campaigns should explore the potential of using behaviour-change strategies focussed on goal setting as an additional incentive for participants, particularly for those who lack motivation. Goal setting is a behaviour-change technique specified by control theory (Carver & Scheier, 1998) and features in SCT (Bandura, 1986) as a self-incentive, mediated by self-efficacy, that individuals set themselves.

Another behaviour-change strategy considered to be effective in one of the programmes was the value of reading of food labels to gain information regarding the nutritional value of food. However, whilst this was considered to be a helpful strategy, the participants also considered the reading of food labels to be quite difficult; knowing what is good and not good. This suggests that more detailed, specific information and advice on reading food labels would be beneficial in future mass media health campaigns, building on the recommendation for more specific advice regarding how to overcome perceived barriers to eating healthier. A further aspect that participants felt could be improved was the need for a wider range of people taking part in the programmes. It emerged from the interviews that the participants typically did not identify with the programme participants, perceived their diets and lifestyles to be considerably less healthy than their own, and this was felt to reduce the programmes impact. Role modelling is a behaviour-change technique proposed in SCT (Bandura, 1986) to enhance an individual's perception of their self-efficacy over performing a given behaviour. Role modelling operates through the process of vicarious learning, whereby an individual observes another individual successfully performing the behaviour. However, for role modelling to work, participants need to identify with the role model. Therefore, future mass media campaigns should consider using a wider range of participants, rather than using only extreme examples of people who are, for example, considerably overweight.

This study is presented as an exploratory study to demonstrate a simple methodology for piloting and evaluating a mass media intervention. It is acknowledged that the television programmes selected may have a different aim to the more formal mass media health campaigns, such as those developed by the Department of Health, focussed on entertainment and maintaining audience viewings. However, as current television programmes, these programmes represent a potentially persuasive source of external influence upon the audience. The observational schedule used in this study, whilst underpinned by key social cognitive theories, did not provide a broad coverage of behaviour-change techniques. Broader, more detailed taxonomies of behaviour-change techniques have recently been developed, notably the taxonomy 26 behaviour-change techniques by Abraham and Michie (2008). Future research should apply the methodology presented here, to more formal mass media health campaigns and using Abraham and Michie's taxonomy of behaviour-change techniques to pilot and evaluate mass media interventions.

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