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Accounting for sitting and moving: an analysis of sedentary behaviour in mass media campaigns

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Abstract

Background: Mass media campaigns are an important tool for promoting health-related physical activity. The relevance of sedentary behaviour to public health has propelled it to feature prominently in health campaigns across the world. This study explored the use of messages regarding sedentary behaviour in health campaigns within the context of current debates surrounding the association between sedentary behaviour and health, and messaging strategies to promote moderate-to-vigorous physical activity (MVPA). **Methods:** A web-based search of major campaigns in the UK, US, Canada and Australia was performed to identify the main campaign from each country. A directed content analysis was then conducted to analyse the inclusion of messages regarding sedentary behaviour in health campaigns and to elucidate key themes. Important areas for future research were illustrated. **Results:** Four key themes from the campaigns emerged: clinging to sedentary behaviour guidelines, advocating reducing sedentary behaviour as a first step on the activity continuum and the importance of light activity, confusing the promotion of MVPA and the demonization of sedentary behaviour. **Conclusions:** Strategies for managing sedentary behaviour as an additional complicating factor in health promotion are urgently required. Lessons learned from previous health communication campaigns should stimulate research to inform future messaging strategies.

Keywords: Health promotion, messages, physical activity

Introduction

Sedentary behaviour poses a health risk to adults which appears to be largely independent of the effects of moderate-to-vigorous physical activity (MVPA)^{1,2}, although findings for children are less clear³. Debate around what constitutes sedentary behaviour^{4,5} led the Sedentary Behaviour Research Network (SBRN) to define it as “any waking behaviour characterized by an energy expenditure ≤ 1.5 METs while in a sitting or reclining posture”⁶. This is distinct from being physically inactive which is defined as not meeting physical activity guidelines (or an equivalent agreed criterion). It is therefore possible for an individual to be both active and sedentary over time, although evidence suggests that those who are active are somewhat less likely to be sedentary⁷. With many individuals failing to meet physical activity guidelines for MVPA⁸ the problem of inactivity and the problem of a sedentary lifestyle inflict a potential ‘double blow’ to health⁷.

The proportion of the day spent being sedentary is increasing for many people^{9, 2}. Many urban environments contribute to this trend. For instance, city workplaces are office-based and school children sit at desks for most of the day. UK adults are spending increasingly more time on computers and less time actively commuting (teleworking increased by 46% between 2006 and 2011^{10,11}). Similar trends are seen in children. For example, between 2011 and 2012, children aged 12-15 spent an additional 2.2 hours per week on the computer and the number owning smartphones/tablets increased by more than eight percent¹². Active commuting amongst children has also decreased by 12% since 2005¹³. The threat of an increasingly sedentary and inactive lifestyle is a global problem^{14,15}. Mass media campaigns have been identified as a potentially useful strategy for promoting improved health behaviours¹⁶.

The proven inverse relationship between sedentary behaviour and health has generated growing media interest in recent years as the following newspaper headlines

demonstrate: “Sitting for long periods is ‘bad for your health’”¹⁷; “Exercise: How to keep fit at your desk”¹⁸. Evidence of distinct health benefits with reducing or breaking up sedentary time has provided health promoters with a cluster of new health behaviours to target¹⁹. Indeed, health promoters have begun to pick up on the sedentary message with an increasing number of initiatives targeting specific sedentary behaviours^{20,21,22}. Examples include, activity report cards to monitor children’s sitting behaviour²³ and standing meetings advised in books such as “Up the Organization”²⁴. It follows that reducing sedentary time should be another goal of health promotion campaigns and that existing mass media campaigns, which already promote physical activity and so benefit from having an existing infrastructure and brand profile, will take the lead. The aim of this paper was to conduct a detailed analysis of the content in current mass media campaigns to inform understanding around the use of messages regarding sedentary behaviour in health campaigns. This content was considered within the context of current debates surrounding the association between sedentary behaviour and health, and messaging strategies to promote MVPA.

Methods

This study employed a directed content analyses²⁵. First, an internet search of literature from the UK, US, Canada and Australia of existing mass media campaigns associated with physical activity and sedentary behaviour was conducted between January and February 2014. These four countries were selected because they were all identified to have released important government sponsored physical activity/and or sedentary behaviour documents since the global physical activity guidelines (with reference to sedentary behaviour) were disseminated and were therefore deemed likely to have conducted concerted promotional efforts in recent years^{8,26,27,28}. Non-English speaking countries were not included.

The search terms used were; “physical activity campaign/promotion/messages”, “sedentary behaviour campaign/promotion/messages”, “health campaign/promotion/messages” and their related words. It was an objective of this paper to explore the most highly visible mass media campaigns, thus we opted to explore those most likely to have public health influence from each selected country. Campaigns were selected based on the amount of media communications related to them which suggested they had received more publicity than other campaigns in their host nations and so were the most influential. Materials from the following campaigns were therefore analysed: United Kingdom (*Change4Life*), Canada (*ParticipACTION*), USA (*5210*) and Australia (Heart Foundation campaigns; *Be Active*, *Measure Up*, *Swap it Don't Stop It* and *Shape Up*). Table 1 provides a list of the campaigns and examples of the messages they have released.

5210 is a campaign that targets the behaviour of children, the Heart Foundation campaigns target adults, while *Change4Life* and *ParticipACTION* target both adults and children, thus the selected campaigns provided important perspectives for promotion to both adults and children. All media related to the campaign was considered including websites, television advertisements, newsletters and posters. Campaign messages were read and critically re-read in order to develop themes about the promotional techniques which are being utilised by physical activity promoters. The framing of sedentary behaviour in relation to other health behaviours was considered.

After a period of familiarisation with the materials of the selected campaigns, campaign messages with the aim of reducing sedentary behaviour were identified and communications were categorised thematically. Messages were tabulated alongside their respective campaigns and from this themes were identified. Messages were read and re-read with key words or phrases highlighted in order to develop themes. An independent researcher later examined the tabulated messages in order to establish agreement regarding the selected

themes. Some of the challenges faced by health promoters producing messages targeting the reduction of sedentary behaviour, and the partnering of messages on sedentary behaviour and messages on physical activity within comprehensive over-arching campaigns are discussed throughout. Therefore, rather than analysing the various campaigns individually, the campaigns were compiled and analysed collectively in order to develop key themes.

Results

Theme one: Clinging to guidelines

The content analysis identified a tendency for messages to rely on the sedentary behaviour guidelines to provide content on how much sedentary behaviour individuals should engage in. Health campaigns have adopted messages with directives which follow the exact wording of guidelines e.g. “engage in no more than two hours of recreational screen time” (5210 *Lets Go! Maine*)²⁹, “setting a limit of two hours max of screen time each day helps make sure kids are active” (*Change4Life*³⁰), and “limit that [screen time] to two hours a day” (*ParticipACTION*). Through its sub-campaign *Up & About*³¹, *Change4Life* expressly targets sedentary behaviour of children after school, the area of the day highlighted by guidelines, using messages such as “get up after eating” and “two hours [screen time] max”.

Theme two: Reducing sedentary behaviour as a gateway to more active lifestyles

The content analysis identified a predilection of campaigns towards combining sedentary behaviour messages with messages on physical activity. While MVPA is optimal for health, health benefits can also be obtained through light intensity activity³² and even at the low intensity range of standing³³. However, messages do not tend to focus on simply breaking up sedentary behaviour with light activity. The language and images used often suggest substituting sedentary behaviour with moderate-to-vigorous physical activity. For instance, *ParticipACTION* messages suggest “Limit that [screen time] to two hours a day and they’ll have more time for physical activity!”, “Turn off the screens. Turn up the play”, and

“unplug and play” (<http://www.participation.com/>). The Australian campaign *Swap it Don't Stop it* urges individuals to “swap sitting for moving” and have released a series of advertisements suggesting a number of swaps for sedentary behaviours e.g. “swap a close park [of your car] for a short walk”, “swap your stop and walk part of the way” and “swap a feed for a lead”³⁴. Similarly, 5210 published a series of advertisements all of which emphasised a variety of different forms of physical activity such as, running, jumping, skipping etc. (<https://www.facebook.com/5210nwfl>). Despite the sedentary message being inherent to the logo and to the campaign aim (<http://www.letsgo.org/>) moving from sitting to less intense activities such as standing, are not featured in any of the 5210 advertisements.

Light intensity activity is highly correlated with sedentary behaviour suggesting that adults are more likely to replace sedentary behaviour with light activity³⁵. In addition, light intensity activity constitutes a greater proportion of behaviour than MVPA. Some messages highlight that reducing sedentary behaviours offers a large proportion of the day to target. For instance, *ParticipACTION* posters present the messages “The average Canadian kid watches up to eight hours of screens every day. Ninety two percent would rather play. Unplug and go out for some good old fashioned fun” and “63% of Canadian kids free time after school and on weekends is spent being sedentary. We need to get our kids moving!” (<http://www.participation.com/get-moving/unplug-play/>). All of these messages suggest participation in MVPA, in favour of more attainable substitutions with light activities thereby neglecting a far greater slice of the ‘behavioural pie’.

Theme three: Complicating the promotion of MVPA

As highlighted in theme two, a number of identified campaign messages intimate that replacing sedentary behaviour with other activities will accumulate guideline-fulfilling MVPA. In *Change4Life*’s hallmark television advertisement *Alfie*; Alfie suggests “[to] swap four wheels for my own two feet to get me going for 150 minutes a week”

(<http://www.youtube.com/watch?v=XYKltGcJDRY>). The advertisement shows Alfie substituting a common sedentary behaviour (in this case driving) for an active one, thereby becoming less sedentary and more active in the process. Further messages employed in the *Up & About* sub-campaign state “setting a limit of two hours max of screen time each day helps make sure kids are active”³⁰. Many of the campaigns frequently mention activities such as ‘taking the stairs’ or ‘parking further away’ as ways of achieving physical activity guidelines. For instance, *LiveLighter*, a *Be Active* campaign states “if you work in an office make your default printer the one furthest away from your desk and force yourself to walk that little bit further to collect your paperwork” (<https://livelighter.com.au/>).

Theme four: Demonization of sedentary behaviour

When advertisements of the campaigns portray sedentary behaviour the images are consistently negative. One *Change4Life* poster reads “Risk an early death just do nothing”. The word ‘death’ is bolded in black so as to stand out whilst the image on the poster is of a bored vacant-looking child sat holding a games controller. Another message in the *Change4Life* supporter’s guide reads “how to limit ‘vegging out’”³⁰. A *5210* television advert shows children kicking a computer screen (<https://www.youtube.com/watch?v=TluNJem6HAI>). The *ParticipACTION* advertisement “Crisis in Canada” contrasts a number of unenthused individuals on their computers, watching televisions and playing video games, with happy and engaged individuals engaged in physical activity (<http://www.youtube.com/watch?v=VNs0gqCn0bg>). Negative terms such as “Couch potato” are used. The Australian *Swap it, Don’t Stop it* campaign mascot Eric is a generally cheerful balloon man, except when he is sat in a sofa or car and his smile becomes a frown (<http://www.youtube.com/watch?v=AFWM97GelPc>).

Discussion

The content analysis identified four themes of messages promoting reduced sedentary behaviour within mass media campaigns: clinging to guidelines, reducing sedentary behaviour as a gateway to more active lifestyles, complicating the promotion of MVPA and demonization of sedentary behaviour.

Health promotion messages are largely shaped around the guidelines at the time. The first identified theme found this trend in messages regarding sedentary behaviour. Currently, prescriptive guidelines (i.e. guidelines stating a specific volume of sedentary behaviour) around sedentary behaviour exist only for children and so such messages were only identified for the campaigns which produce materials targeting children (*5210*, *ParticipACTION* and *Change4Life*). While guidelines regarding sedentary behaviour are available they lack the prescriptive detail found in guidelines for physical activity⁸, diet³⁶ and alcohol³⁷. UK and Australian guidelines for sedentary behaviour currently provide general advice to; “minimise the amount of time spent being sedentary for extended periods (except time spent sleeping)”⁸. Canadian guidelines for sedentary behaviour more specifically recommend that recreational screen time be limited to two hours per day³⁸. However, dose-response has yet to be identified³⁹. It is uncertain whether a longer total sedentary time that is broken up regularly (e.g. an adult or child who sits at a desk all day but gets up for five minutes every hour) is preferable to a shorter total sedentary time that is rarely broken up (e.g. an individual who is only sedentary in the evening but for four hours continuously). Sedentary behaviour guidelines do not prescribe a maximum duration of daily or weekly sedentary time or the specific types of behaviours to limit (e.g. television watching, passive commuting, restraining toddlers in a high chair, etc.) due to the lack of precise evidence to guide such parameters. Previous research by Knox and colleagues suggested that messages which cling closely to physical activity guidelines may be motivationally deleterious when the goal is to increase

engagement with MVPA⁴⁰. Unimaginative messages which dwell on underdeveloped sedentary behaviour guidelines are unlikely to provide the motivation to improve behaviour as they may be similarly unable to provide optimally-challenging attainable goals and lack specific information. Latimer-Cheung and colleagues recently called for a strategy to disseminate physical activity guidelines⁴¹. The emergence of the sedentary behaviour topic within physical activity campaigns suggests that a strategy to develop messages targeting sedentary behaviour is also required.

The promotion of sedentary behaviour offers a gateway to more active lifestyles but current messages are not capitalising on the full activity spectrum. Theme two shows a persistent focus on swapping sedentary behaviour for physical activities instead of less intense activities such as standing. Consequently, a lack of awareness regarding the independent benefits of limiting sitting time could make it more difficult to convince the general population that swapping sedentary behaviours for activity that is only marginally more active (i.e. sitting for standing) and does not constitute MVPA, holds value^{9,33,42}. Anecdotal evidence from internet discussions and public responses to news items regarding sedentary behaviour suggests that portions of the general public are aware that too much sitting is bad for their health but do not recognise that modifications as small as standing during the commercial break of a television programme can improve health (e.g. “It's not that these scientific edicts aren't correct it's the whole 'state the bleeding obviousness' of it I can live without”; “There's nothing that we can do other than installing treadmills behind every school and office desk” [comments posted in response to the BBC News article “Sitting for long periods is ‘bad for your health’”¹⁷]). Further, individuals are sedentary for around six hours a day⁷. Intuitively, it seems unlikely that individuals will be persuaded to change all of this behaviour into physical activity such as running, bicycling etc. Such ambitious messages could be motivationally deleterious for the majority of adults who are currently engaging in

almost no physical activity^{43,44}. Messaging campaigns targeting large (or entire) populations may benefit from being realistic rather than idealistic. As discussed by Hamilton and colleagues the proportion of the day taken up with ‘nonexercise’ activity (NEAT) far exceeds that taken up by exercise (i.e. MVPA)⁴⁵. By neglecting low intensity behaviours such as standing, a large ‘window of opportunity’ is being lost in terms of accumulating health benefits over the course of an entire day. Offering greater flexibility in the time of day at which lifestyle changes can occur and encouraging smaller steps towards an active lifestyle may be more realistic and therefore effective in motivating positive behavioural change^{46,39}. Positively-framed messages around sedentary behaviour offer more achievable small steps towards generally more active lifestyles. Reducing sedentary behaviour may be seen as a first step on the physical activity continuum and presents a more attainable option for most individuals⁴⁷. Messages which encourage reduced sedentary behaviour may resultantly have the potential for greater population health gains than messages which only promote MVPA due to a greater likelihood of compliance⁴⁸.

The failure of campaigns to promote light intensity activity and instead tie sedentary behaviour messages to those on MVPA leads us to another theme. The third identified theme is the possibility that messages regarding sedentary behaviour could confuse perceptions around MVPA and even detract from its perceived importance. Reducing sedentary behaviour requires increased engagement with active alternatives but it does not necessarily follow that these alternatives will result in the accumulation of more MVPA. Some research suggests it is more likely that sedentary time will be replaced with light forms of physical activity rather than guideline-fulfilling MVPA⁴⁹. Many advertisements recommend substituting sedentary behaviours with activities such as taking the stairs instead of the lift and walking from the car to the supermarket, and suggest such adjustments will contribute towards individuals meeting MVPA guidelines. However, these activities were never

intended to be promoted as guideline-fulfilling MVPA but to be reinforced as part of the regular ‘active lifestyle’ routine³³. These messages could contribute to misperceptions regarding MVPA engagement in adults and lead to a devaluation of engaging in true MVPA^{50,51,52,53,54,55,56}. While reducing sedentary behaviour in itself can result in some health gains¹⁹, it is important that this is not seen as an alternative to increasing MVPA. Indeed, engaging in more intense forms of physical activity is still likely to provide the greatest health returns⁵⁷, notwithstanding the difficulty (perceived and/or actual) of achieving such levels. In addition, the 150 minute a week MVPA guideline is based on the assumption that people already engage in regular lifestyle activity. Those who engage in little lifestyle activity may need to do more MVPA for good health, while those with very active daily lives can probably do less. Health promotion experts need to account for an increasingly heterogeneous range of behaviours outside of an ‘active-sedentary’ dichotomy. It is important that the current media interest in sedentary behaviour does not result in messages regarding MVPA being lost.

The fourth identified theme is the demonization of sedentary behaviour. A recent campaign launched in the UK entitled *Move1hour* carries a logo which depicts a chair with a skull as the back-rest, alongside the slogan “Sitting is the new enemy”. (<https://www.facebook.com/MOVE1HOUR>). The messages examined in the present study were similarly negative with regards to sedentary behaviours, although perhaps less extreme. Such aggressive messaging approaches seem unwise in light of the lack of evidence to support their efficacy, especially considering findings that fear appeals and negative framing may not be motivational^{58,59,60}. Some sedentary behaviour is essential and even valuable. Cars enable individuals to travel longer distances, family meal times are spent sat at the table and for many computers are a necessary part of the working day. The *Change4Life* poster “Risk an early death, just do nothing”, inflamed some individuals and societal groups to the extent

that an alternative poster was independently printed carrying the same message but alongside a picture of a child sat reading. Clearly, a more thorough consideration of the contribution of sedentary behaviour and its place in society is needed before messages castigating it are disseminated.

Future directions

We suggest three areas to focus future research. First, it is important to investigate whether messages on sedentary behaviour and physical activity can and should be presented together. Researchers need to consider the repercussions of presenting the two types of messages together on comprehension and motivation, and reflect on this when pilot-testing campaigns. This requires an investigation into the effects of one type of message on the other and vice versa. So far, research has only focused on the effect of physical activity messages on the understanding of physical activity behaviours^{61,62,59,60,63,64,65,66,58,67,68,69,70,71,72,73,74,75,76,77}. However, we posit that physical activity messages will influence understanding of sedentary behaviours and, in the same way, messages regarding sedentary behaviour will influence perceptions of physical activity. Research into the implications of this symbiotic relationship is needed to align these two important areas of research through messages which compliment rather than contradict. In addition, the contexts and populations in which each type of message is presented will be influential. For instance, messages regarding sedentary behaviour are likely to have a very different influence on perceptions when presented in a workplace or school environment relative to a gym or a leisure centre.

Second, different strategies of combining messages should be explored. Health campaigns could emphasise the reduction of sedentary behaviour, as exemplified by the *5210* campaign which targets “two hours or less recreational screen time”, or the introduction of more light activity as seen in the tips section of the *Change4Life* website; “The furthest

parking space could be good for you”. These subtle differences may influence the way in which campaigns are perceived. Messages around changing lifestyle to improve both health behaviours should be a focus of future research. Brawley and Latimer have previously discussed the need for messages on MVPA guidelines to inform individuals how more MVPA may be engaged⁷⁸. We agree with these sentiments and suggest that such information should also be present in sedentary behaviour guidelines from the outset. Viable strategies for replacing sedentary behaviour with both light activity and MVPA should be investigated.

Finally, if theories typically used to understand physical activity behaviour such as the TPB⁷⁹ are also to be applied to understanding sedentary behaviour, work is required to see how appropriate they are and whether modifications are needed or new approaches should be adopted⁸⁰.

Conclusion

Wareham and Brage have called for caution when delivering public health messages and suggested changes should only be made when the evidence is robust⁸¹. Excessive sedentary time presents a major health threat^{82,83} causing some health campaigns to introduce sedentary messages despite lacking evidence to inform them. This analysis of major activity-related campaigns in four countries identified four themes associated with messaging sedentary behaviour: clinging to guidelines, sedentary behaviour as a first step on the physical activity continuum, complicating the promotion of MVPA and the demonization of sedentary behaviour. A consortium of academics, policy-makers and marketing experts from the realms of physical activity and sedentary behaviour should be brought together to synthesise existing research and stimulate new research to inform further development of guidelines, more expansive shaping of health campaigns and successful execution of activity-related messages.

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Table 1. Examples of messages from major campaigns in the UK, US, Canada and Australia promoting physical activity and reduced sedentary behaviour

Campaign	Example of a physical activity message for children	Example of a physical activity message for adults	Example of a sedentary message for children	Example of a sedentary message for adults	Empirical investigation of reach or effectiveness
Change4Life	60 active minutes (2009 Poster)	Walking is one free, fun and flexible way for adults to get going and build towards their weekly 150 active minutes (2011 Newsletter)	Setting a limit of two hours max of screen time each day helps make sure kids are active”	Swap four wheels for my own two feet	Large reach and high awareness in the population have been reported ^{1,2} . Inconsistencies in the campaign messages have also been highlighted ³ .
5-2-1-0	1 hour or more of physical activity (http://www.letsgo.org/)	X	2 hours or less recreational screen time (http://www.letsgo.org/)	X	Little empirical research. First year evaluation suggests reaching over 320,000 kids ⁴ .
ParticipACTION	...revive hide and seek, let’s give them 60 minutes a day of physical activity (2012 Bring Back Play television advert)	Get inspired. Get moving	Unplug and play	Park the car	Reports of large reach and high awareness of messages ⁵ . Credited as being the most successful campaign ever ⁶ .
Australian HF Campaigns	X	Walk yourself happy. Just 30 mins a day be active.	X	Swap sitting for moving	Little evaluation. Only aspects of the sub-campaign <i>Measure Up</i> has been evaluated. Awareness was high but was lowest amongst inactive adults ⁷ .

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