The Effect of Positively Framed and Negatively Framed Messages on Televised Smoking Cessation Advertisement Success: A systematic review

Michelle H. James
Collaborative Evaluation Unit, School of Health, Federation University, P.O.Box 3191, Gippsl and Mail Centre, 3841, Churchill, Victoria, Australia

Joanne E. Porter
Collaborative Evaluation Unit, School of Health, Federation University, P.O.Box 3191, Gippsl and Mail Centre, 3841, Churchill, Victoria, Australia

Vaughan Reimers
Collaborative Evaluation Unit, School of Health, Federation University, P.O.Box 3191, Gippsl and Mail Centre, 3841, Churchill, Victoria, Australia

Valerie Prokopiv
Collaborative Evaluation Unit, School of Health, Federation University, P.O.Box 3191, Gippsl and Mail Centre, 3841, Churchill, Victoria, Australia

The Effect of Positively Framed and Negatively Framed Messages on Televised Smoking Cessation Advertisement Success: A Systematic Review

Michelle H. James*, Joanne E. Porter, Vaughan Reimers, Valerie Prokopiv

Collaborative Evaluation Unit, School of Health, Federation University, P.O. Box 3191, Gippsland Mail Centre, 3841, Churchill, Victoria, Australia

Abstract

Background: Smoking cessation campaigns aim to decrease the prevalence of smoking in the community. However, smoking cessation campaigns can be expensive to develop and implement, therefore is it essential that campaigns have high impact and broad reach to ensure the most efficient use of resources.

Method: A systematic review was conducted in October 2020 to assess the efficacy of positively framed and negatively framed messages used in televised smoking cessation advertisements. The search was restricted to quantitative primary research published between 2010 and 2020, yielding 4640 results. Study selection was performed using the PRISMA method. Population was inclusive of all ages and smoking status. A total of 15 articles met the criteria for review.

Results: Negative messages were found to increase the likelihood of a smoker intending to quit, attempting to quit, successfully quitting, or calling a quitline, while some studies found that positive messages increased confidence to quit and calls to quitline. Combination of negative and positive messages were found to complement one another and were more successful at influencing quit behaviour than using either message type alone. However, findings were not consistent across all studies.

Conclusion: The results of this review may be used to inform the development of future smoking cessation advertisements to ensure content is relevant, effective, and cost-efficient. Further exploration of the efficacy of positive and negative messages on target populations would be valuable to advise the design of cessation campaigns.

Keywords: Cessation, Negative messaging, Positive messaging, Smoking, Television advertisement

1. Introduction

According to the World Health Organisation (WHO), more than one billion people worldwide smoke cigarettes [1]. Higher rates of smoking are associated with poorer health conditions, heart disease, diabetes, stroke and cancer, among others, and increased risk of death [2]. The consequences of smoking can also lead to significant social, financial, and economic cost to both the individual and the community, with the risk of passive smoke inhalation harming non-smoking community members and smoking related illness leading to increased demand for health services. Worldwide, smoking accounts for more than 8 million deaths per year and has an estimated global economic cost of US $1.4 trillion [1].

Smoking cessation campaigns Smoking cessation campaigns aim to decrease the rate of smoking within a target population and prevent people from engaging in smoking behaviour in the future [3]. By decreasing the prevalence of smoking in the community, cessation campaigns also reduce the economic burden of smoking while significantly lowering the risk of preventable disease and improving health outcomes, even among long-term smokers [4]. However, smoking cessation campaigns can be expensive to develop and implement, therefore material with high impact and broad reach are sought to ensure the most efficient use of resources and reduce long term advertising costs [3].

Multiple advertising mediums exist which can be used to distribute smoking cessation campaigns, including video, radio, print media (i.e. newspaper,

magazines), billboards and social media. Among them, one of the most widely used advertisement mediums is video. This includes advertisements distributed via television, social media, and streaming services. When designing a smoking cessation media campaign, Durkin et al. [5] suggests that population exposure is a vital measure of advertisement success, and thus television is the primary method of campaign distribution to influence smokers. Televised advertisements are commonly utilised because they can reach a broad range of socio-economic, regional, and indigenous communities and can overcome geographical barriers [6—8].

Studies show that use of televised advertisements in smoking cessation campaigns can successfully motivate viewers to participate in quitting behaviour including thinking about, attempting to, and seeking help to quit, and can assist in maintaining abstinence [5]. Research also suggests that smoking cessation advertisements broadcast via television can have greater effect than other mediums such as radio or newspaper, but that television is a significantly more expensive form of advertisement [9], reiterating the importance of making advertisement content as efficacious as possible.

The content of televised cessation advertisements is commonly described as either negative or positive [10]. Negative content includes messages which emphasise the detrimental health effects of smoking, reduce the social acceptability of smoking, and elicit feelings of guilt or shame. Conversely, positive content utilises messages which encourage quit attempts, emphasise support services and empowers the viewer to quit. Caution is required when designing an advertisement so that the content chosen is most likely to reduce smoking rates to minimise the cost of repeated campaigns and ongoing health service use. However, the efficacy of negative messages versus positive messages has not yet been determined as there is a significant lack of research in this space and many existing studies were conducted prior to recent advancements in advertising technology.

The aim of this systematic review is to assess whether positive or negative messages used in smoking cessation advertisements are more effective at influencing smoking attitude, intention, and behaviour. The results of this review may be used to inform the development of future smoking cessation advertisements to ensure content is relevant, effective, and cost-efficient.

2. Method

The methodology of this systematic review aimed to identify and summarise research articles pertaining to the message content of televised smoking cessation advertisements. The systematic review was conducted using the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) method [11] to ensure the process was transparent and accurately reported. In addition to the PRISMA method, the Matrix method [12] was used to assist in the extraction, critique and summarisation of selected studies.

2.1. Data sources

The search was conducted in October 2020 using EBSCO, ERIC, Scopus, and Wiley databases. Search terms included "nicotine", "tobacco", "smoke*", "cigarette", "cessation", "stop", "quit", "advertis*", "ad", "commercial", "marketing", "campaign", "intervention", "TV", "television", "media", "audiovisual", "digital", and their variations, directed by a Boolean search strategy whereby search terms were separated by "and"/"or". The search strategy yielded 4640 results (Table 1).

2.2. Study selection

Study selection was performed using the PRISMA flow chart (Fig. 1). Search results were sequentially assessed via title and abstract. To be included in the review, research articles were required to satisfy the following inclusion criteria: 1) discuss and assess a televised smoking cessation advertisement, 2) provide sufficient detail of the advertisement to identify the message(s) as positive or negative, 3) be published as an original research article in a peer-reviewed journal, 4) be written in English, 5) present a quantitative analysis, and 6) be published within the last ten years (2010—2020).

Studies were excluded if they advertised, endorsed, or promoted the use or cessation of vaping, electronic cigarettes, or alternative tobacco

Table 1. Databases used to search for relevant literature.

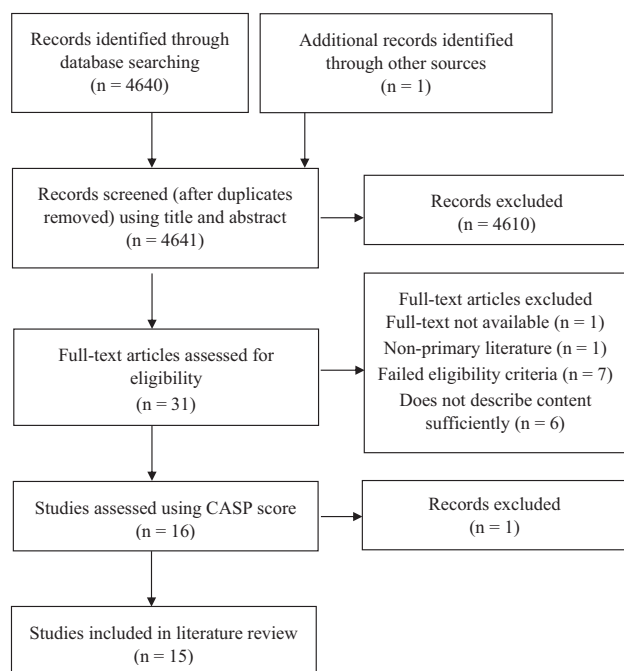| Database	Results
Academic search complete	774
APA PsychArticles	4
APA Psychinfo	461
CINAHL Complete	506
ERIC	26
Medline	850
PubMed	123
Scopus	1072
Taylor & Francis Online	405
Web of science	264
Wiley	155
Total number of articles	4640

Fig. 1. PRISMA flow chart of search strategy.

products such as nicotine gum, inhalers, lozenges, or nasal spray. Articles were also excluded if they primarily addressed forms of media other than television, such as social media, print, radio, or on-line advertisements. The remaining papers were then screened using the full-text and selected articles were cross-checked by all four authors to ensure consensus. Duplicates and papers which failed the eligibility criteria were removed. Lastly, the cite list and reference list of remaining and relevant articles were examined to ensure all pertinent papers had been identified. One additional article was identified and added to the PRISMA flow chart before being reviewed. Selected articles were critically examined to ensure scientific rigour, credibility and relevance using the Critical Appraisal Skills Programme (CASP) checklist [13]. They were rated as a percentage of compliance and scores less than 70% were excluded from the analysis. The study selection identified 15 papers for review.

2.3. Data extraction

The matrix method was then used to assist the summarisation and critique of selected studies. The author(s), year, country, design, participant demographic, number of participants, message, outcome measures and results are presented in Appendix 1 in order of author alphabetical order.

Where an article did not define content as negative and positive, the advertisement was categorised independently by two authors. This was achievable due to the inclusion criteria requiring a satisfactory definition of the advertisements to be included in the review. There was complete agreement between the authors on the classification of content as negative or positive.

3. Results

A total of 15 articles met the screening criteria for inclusion in this systematic review. The articles were conducted in or using data derived from participants in the USA (n = 11), Australia (n = 1), New Zealand (n = 1), the UK (n = 1) and Norway (n = 1). All studies used a quantitative method of analysis. Two studies used a Randomised Controlled Trial (RCT) and repeated measures, nine used existing or cohort survey data, and four used number of calls to quitlines to indicate advertisement effect. Within the studies, dependent variables included smoking attitude, beliefs, intention, behaviour, confidence quitting, and calls to quitline. Fourteen studies used participants aged 18 years and over, while one study assessed youth aged 11−17 years. Participants included both males and females, current smokers, past smokers, and non-smokers. The definition of a 'smoker' varied, including somebody who has smoked at least 100 cigarettes in their lifetime and now currently smokes some days or all days, people who have smoked at least once in the previous month, daily smokers, people who smoke 'on rare occasions', or youth who have smoked at least one cigarette in the past 30 days. Four studies did not define the term smoker.

The advertisements came from existing smoking cessation campaigns such as the Tips from Former Smokers (Tips) campaign, the New York Tobacco Control Program, the Tobacco. Reality Unfiltered (TRU) Campaign, the Stop Before You Start campaign, the EX-campaign, and other state-wide or international advertisements. Seven studies compared the effects of positive and negative messages, seven assessed the effect of only negative messages, and one assessed the effect of only positive messages. A critique of the studies included in this review is presented below under the following headings: 1) Effect of negative advertisement messages, and 2) Effect of positive advertisement messages. Each section includes an analysis of study outcomes including change in smoking attitude, intention, and behaviour. Change in smoking attitude includes changes to cognitions and beliefs about smoking. Change in smoking intention

includes intention to change smoking behaviour or intention to quit. Calls to Quitline are also used as in indicator of smoking intention. Change in smoking behaviour includes increasing quit attempts and change to population smoking rates.

3.1. Effect of negative advertisement messages

Advertisements containing negative messages, also referred to as Why To Quit (WTQ) messages, included content such as emotional testimony, graphic imagery, messages eliciting fear, guilt or disgust and showing the detrimental health effects of smoking.

3.2. Change in smoking attitude

The review identified one RCT which assessed change in smoking attitude by assigning participants to conditions of random exposure and surveying their response to both negative and positive messages. This study found that negative messages resulted in significantly higher perceived effectives ($p < .001$) and higher negative emotional reaction ($p < .001$) than positive messages, which was indicative of increased negative feelings about smoking, confidence quitting, and belief that quitting would improve health [14].

Four cohort studies used a survey of participants to indicate the effect of negative messages on smoking attitude. Three of the cohort studies assessed the US *Tips* campaign which showed smokers providing graphic and emotional personal testimonials of their smoking-related diseases, before linking viewers to a state quitline [15−17]. All three studies surveyed participants before and after the campaign period. Negative messages were associated with significantly increased cognitions regarding smoking, including increased knowledge of associated smoking-related health conditions ($p < .05$) and worry about health risks ($p < .001$) [15]. Knowledge of lesser-known health risks increased significantly (33%−46% for amputation, $p < .001$; 11%−18% for blindness, $p < .001$) however knowledge of well-known risks did not (78%−77% for heart attack, $p < .94$) [16]. Huang et al. [16] hypothesise that this may be due to most smokers being already aware of the risk of heart attack, whereas the risk of amputation and blindness are lesser-known consequences of smoking.

The fourth cohort study evaluated the effect of the "Stop Before You Start" campaign was a negative message cessation campaign featuring a middle-aged man personified as a cigarette and designed to be unattractive. Li et al. [18] found that the campaign, described as "disturbing" and "creepy", was targeted towards young adults (aged 18−24 years) but was equally effective in changing smoking-related cognition and awareness in adults aged 25 years and over, indicating that the same advertisement could be effectively expanded to target multiple age groups.

3.3. Change in smoking intention

Four cohort studies used calls to quitlines to indicate the effect of negative messages on smoking intention. Periods of advertising in which negative messages were shown correlated with increased calls to quitlines in Australia [19], the UK [10] and the USA [20,21]. This finding was stronger for populations that resided in areas of high socio-economic status (SES) than those with low SES ($p < .001$) [19]. However, the effect of negative messages on low SES populations was increased when the advertisement included highly emotive content and a narrative format ($p = .001$) [19]. Negative messages were also associated with calls from people who were less ready to quit or had low confidence in quitting, indicating that the advertisements successfully changed smoking intention [21]. However, one study suggested that the effect of negative messages on calls to quitline were not as strong as the effect of positive messages or required a higher level of exposure to achieve the same effect [10].

Three cohort studies used surveys to indicate change in smoking intention. When surveyed, participants indicated that negative messages significantly increased awareness of cessation resources ($p < .020$) [16] and intention to quit ($p < .05$) [15], and the likelihood of initiating pre-cessation behaviour such as visiting a cessation website or calling a quitline increased but was not significant [16]. Another study used negative emotive content designed to elicit disgust to measure the response of both smokers and non-smokers and compared this to content containing humour [22]. This study found that disgust content was associated with greater motivation to quit than humour [22].

3.4. Change in smoking behaviour

One RCT assessed the effect of negative messages on smoking behaviour. Participants were allocated to conditions of repeated exposure to different cessation advertisements. The study found that exposure to negative messages increased the likelihood that a smoker would attempt to quit in the following four weeks ($p < .001$) [23]. Further, it was

found that at four-week follow-up, people assigned to view negative advertisements featuring emotional personal testimonial were less likely to be smokers (6.1% weighted non-smokers) than those who viewed graphic images (4.7% weighted non-smokers) [23], highlighting the variability of different types of negative content and effect on smoking behaviour.

Four cohort studies used a survey of participants to find that negative messages increased quit attempts [3,7,16,17]. McAfee et al. [17] found that quit attempts increased from 31.1% to 34.8% ($p = .02$) over the campaign period, while Huang et al. [16] found that quit attempts increased from 39% to 44%, but this result was not statistically significant when adjusted to a larger sample. Negative messages were also more likely to be recalled by participants than positive messages [3]. This is significant as awareness of smoking cessation campaigns has been found to decrease the likelihood of current smoking or engaging in experimental smoking behaviour among high-sensation-seeking youth, and sensation seeking is associated with greater risk of smoking [24,25]. Two cohort studies found that the impact of negative messages on quit attempts was higher for people of low SES and an education level of high-school degree or less [7,17].

In another cohort study, the EX-campaign was assessed to compare positive and negative messages including the dangers of smoking and exposure to second-hand smoke versus encouragement and advice on quitting [7]. Smokers were surveyed and it was estimated that during the study period, each participant saw an average of three negative and three positive advertisements per month. Negative messages were associated with making a quit attempt in the past 12 months and being able to recall at least one negative advertisement increased the likelihood of making a quit attempt by 29% ($p < .05$) [7].

3.5. Effect of positive advertisement messages

Advertisements containing positive messages, also referred to as How To Quit (HTQ) messages, included content such as examples of smokers who have successfully quit, encouragement to quit, empowering smokers and contact information for support services.

3.6. Change in smoking attitude

Two repeated measures studies assessed the effect of positive messages on smoking attitude. Duke et al. [23] found that positive messages increased

participants confidence in quitting, and Davis et al. [14] found that positive messages resulted in significantly higher motivational reaction ($p < .001$) than negative messages [14].

One cohort study measured awareness of the EX-campaign, which includes encouragement and/or advice on quitting. This study found that the advertisement was positively associated with the cognitive measures "thinking about quitting" and "thinking about which cigarettes during the day would be hardest to give up" ($p < .01$). Additionally, 62% of participants surveyed were aware of the EX-campaign and 79% were able to report aided awareness [26].

3.7. Change in smoking intention

Three cohort studies which included an analysis of positive messages revealed that periods of advertising in which positive content is shown correlated with increased calls to quitlines [10,20,21]. Calls to quitlines were found to be 1.9 times higher when advertisements describing 'how to quit' − classified as positive messages - were aired compared to no cessation advertisements at all [21]. However, the effect of 'how to quit' advertisements was not as high as the effect of negative messages showing graphic imagery (2.1 times more calls) or emotive testimonial (2.6 times more calls) [21]. This is contrary to the findings of Richardson et al. [10] who found that positive messages had a greater effect on calls to quitlines than negative messages.

3.8. Change in smoking behaviour

One RCT study by Davis et al. [14] found that positive messages had no effect on quitting behaviour. The results of two cohort studies also did not support the use of positive advertisements for smoking cessation [7,26]. Use of the EX-advertisement was not associated with making a quit attempt in the past 12 months [7], and although Vallone et al. [26] reported increased awareness and smoking cognitions, awareness of the EX-campaign did not translate into behaviour change or making a quit attempt. The authors suggest that based on the multivariate model analysis, significant change in behaviour may have been detected if the study had used a larger sample [26].

4. Discussion

This review found mixed results for the efficacy of positive and negative messages in smoking cessation advertisements. Both positive and negative

messages correlated with changes in smoking related attitude, including increased negative feelings about smoking and increased knowledge and worry about the health risks associated with smoking [14–16]. Two studies found that positive messages were more effective than negative messages at increasing confidence in quitting [14,23], however, this finding was contradicted by Vallone et al. [26] who found no relationship between positive messages and increased confidence in quitting.

Both positive and negative messages resulted in changes in smoking intention measured using calls to quitlines [10,19,21]. One study suggested that the effect of positive messages on calls to quitline were greater than the effect of negative messages, or that negative messages required a higher level of exposure to achieve the same effect [10]. This was contradicted by Nonnemaker et al. [21] who found that the effect of positive messages on calls to quitlines was not as high as the effect of negative messages showing graphic imagery (2.1 times more calls) or emotive testimonial (2.6 times more calls). However, it should be noted that not all people who are encouraged by TV advertisements to make a change in smoking behaviour seek help to do so, with some preferring to quit on their own [27]. Therefore, the results of studies which use calls to quitlines to measure effect may have greatly underestimated advertisement efficacy.

In most studies where the success of positive and negative messages was compared, positive messages were not found to be as effective as negative messages to change smoking intention and behaviour. Negative messages increased the likelihood that a smoker would intend to quit, attempt to quit, or successfully quit [3,7,15–17,23], while positive messages were associated with less motivation to quit, were less often recalled, or had no effect on quit attempts compared to negative messages [3,7,14,22]. In support of these findings, the World Health Organisation promotes MPOWER tobacco control measures, which includes the key priority to "Warn about the dangers of tobacco" [1]. Negative messages are identified as an effective strategy to reduce smoking rates and to satisfy this measure.

There is support within this review that to be most effective, a combination of positive and negative messages should be incorporated into the same campaign [10,14]. This is premised by the finding that while negative messages are responded to most favourably by smokers, it is positive messages that inspire the greatest confidence and elicit the strongest motivation to make a quit attempt [14]. Therefore, the two message types complement one another and are more successful at influencing quit

behaviour in combination than using either message type alone. However, the findings of Davis et al. [14] and Duke et al. [23] do not support this theory. A combination of positive and negative messages did not significantly increase audience reaction, quit intentions or smoking behaviours compared to advertisements containing negative messages alone, and no effects were found when using positive messages only [14,23]. In some cases, combination of negative and positive messages appear to dilute audience reaction [14] and likelihood of making a quit attempt in the following four weeks [23]. This suggests that the inclusion of positive messages may not be beneficial. Conversely, evidence suggests that advertisements which try to elicit guilt or shame from a smoker can actually be counterproductive in discouraging smoking [28]. Therefore, when designing a cessation campaign, care should be taken to research the target population and consider the results of past campaigns.

While some studies have suggested that the effect of smoking cessation advertisements dissipate after 3-months [29] multiple studies in this review suggest a more longitudinal effect with sustained results for negative messages at 6 months [15] and both negative and positive messages up to 1-year post exposure [7]. These are encouraging results as longitudinal effects reduce the need to repeatedly promote campaign advertisements and reduce associated costs, while supporting the efficacy of positive and negative messages in promoting sustained behavioural and cognitive change.

4.1. Academic implications

The findings from this review shed further light on both Protection Motivation Theory (PMT) and the Health Belief Model (HBM). Both of these theories posit that people are motivated to protect themselves from harm as the result of a threat appraisal process reflecting an individual's perceptions of their vulnerability to a given risk, and the severity of that risk [30,31]. However, while these theories have both made significant contributions, the empirical evidence in support of the PMT [32] and the HBM [33] has been mixed. It is therefore significant that as per the findings from this study, it is those cessation advertisements that reflect the threats involved in smoking (negative messages) that are more likely to result in cessation-oriented attitudes and behaviour.

Self-efficacy Theory may be used to explain why some studies found that positive messages were more effective than negative messages at changing smoking related attitude and intention. Studies

show that self-efficacy is indicative of cognitive change among smokers before attempting to quit, and that higher self-efficacy is a predictor of quitting success [34]. While overall positive messages were not found to be as effective as negative messages, they do act as an important cessation tool that is highly effective for some people who smoke.

4.2. Future research

The content of advertising campaigns is often defined by the target audience. For example, women are more effected by negative messages that emphasise the health effects of smoking, while men are more motivated by positive messages that include empowering content [8]. Similarly, positive messages are more effective at encouraging current smokers to quit but negative messages are more likely to draw the attention of non-smokers and encourage them not to engage in smoking behaviour in the future [35]. This review found that negative messages had greater impact on call frequency to quitlines among low SES populations than high SES populations and were associated with calls from people who were less ready to quit or had low confidence in quitting [19,21]. However, it should also be noted that these target groups were not investigated for positive messages. The current review collates the results of multiple advertisements across three continents, giving a broad overview of the effect of positive and negatively themed messages and contributing a valuable perspective to the literature of health research and promotion. A review of the effect of positive and negative messages could be expanded in future to include multiple populations so that content can be customised to better target a specific audience when required. Future research should be used to inform policy makers and cessation focused agencies such as quitlines about the most effective advertisement strategy for the target population, to maximise the impact of future cessation campaigns.

It should be noted, also, that this study was conducted in the specific context of broadcast television, and therefore does not consider the impact of streaming media. For example, as of 2016, Netflix has essentially operated as a global Internet TV network with access to almost every country on the planet. While streaming media serves as an extension of the television experience, in many markets, it is not subject to the same regulatory control and censorship [36]. The significance of this stems from that fact that in some countries Netflix is now viewed more frequently than broadcast television [37] and that its programs have been found to

feature smoking imagery more often [38]. Hence, considering calls for greater regulation of streaming platforms [39], it is recommended that to complement the findings from this study, future research focus on measuring the impact of whatever interventions might be introduced to better regulate how and how often smoking imagery is featured via streaming media.

4.3. Limitations

This systematic review has several limitations. First, while the studies included in this review were published between 2010 and 2020, the data included in some articles dated as far back as 2002, and it was necessary on occasion to draw on additional studies preceding this period in order to provide a critical analysis of the studies being reviewed.

Second, the articles included in this review were restricted to English language only, resulting in the inclusion of sources primarily from Western and European countries. It must be acknowledged that articles published in other languages were not able to be captured in this review but may offer a different result regarding the effect of positive and negative messages. Additionally, the literature search resulted in a greater number of articles from the USA than other included countries, potentially giving greater weight to results derived from this population in comparison to advertisements from other locations.

Third, it is problematic to equate studies with differing methodologies and incomparable rigour in study design as this makes it difficult to compare the effect of independent variables. The studies included in this review used a multitude of research methods to assess the efficacy of selected advertisements including repeated measures, cohort surveys and calls to quitlines. Therefore, it is difficult to make direct comparisons of the results of these studies. The effectiveness of cessation advertisements was also measured using a variety of approaches, including reported quit attempts, thoughts about quitting and recall of cessation advertisements while others measured beliefs, knowledge, and cognitions about smoking. Without one comprehensive, validated metric for measuring advertisement effectiveness it is difficult to compare message efficacy.

Lastly, confounding variables such as length of exposure, frequency, relatability, and additional cessation strategies such as taxes and smoke-free air laws may also influence advertisement success [14,15,40]. The repeated measures studies included in this review used random allocation and

demographic distribution to minimise the effect of confounding variables and provide the most accurate measure of effect. However, repeated measures studies use an artificial form of exposure for study participants which does not replicate the likely lived experience of participants viewing advertisements from home. Conversely, cohort and survey studies - which made up the majority of studies included in this review (n = 13) - do not allow for random allocation of participants to minimise confounding variables. Survey and cohort studies also rely on self-report to measure exposure which can be subject to response bias [41]. However, these study designs report on a more authentic experience as participants were exposed to the subject matter naturally before participating in the study.

5. Conclusion

This systematic review adds to the growing body of evidence regarding the effectiveness of smoking cessation advertisements and the messages used to illicit a cognitive or behavioural change in current and prospective smokers. While the results of using negative messages in smoking cessation advertisements were mostly favourable, the results for using positive messages were mixed. There is some support for using a combination of both positive and negative messages although results for whether or not the addition of positive messages adds to the

efficacy of a campaign were inconsistent. Further, positive and negative messages are each effective at targeting a different form of cognitive or behavioural change, with negative messages increasing the likelihood of a smoker intending to quit, attempting to quit, or successfully quitting and positive messages increasing confidence in quitting and calls to quitline. This review is the first of its kind to systematically compare the efficacy of positive and negative messages. The results have major implications for future cessation campaigns, policy makers, and cessation focused agencies such as quitlines, which can be guided by this review to design their advertisement in accordance with their target audience to ensure content is relevant, effective, and cost-efficient. This also has the potential to prevent smoking-related illnesses and harms, and to reduce overall population smoking rates. Further exploration of the efficacy of positive and negative messages on target populations would be valuable to advise the design of future cessation campaigns.

Conflict of interest

The authors report no conflict of interest.

Appendix 1. Summary of the systematic review

Author(s)	Year	Country	Design	Participants	n	Message	Outcome measures	Results
Davis et al. [14]	2013	USA	Randomised controlled trial	Male/female adult smokers	3411	N/P	Smoking attitude, beliefs, intention, behaviour	Negative messages increase emotional reaction and perceived effectiveness. Positive messages increase motivation and confidence quitting.
Duke et al. [23]	2014	USA	Randomised controlled trial	Male/female adult smokers	3002	N/P	Smoking attitude, beliefs, intention, behaviour	Negative messages increase the likelihood of a smoker quitting in the following 4 weeks. Positive messages do not.
Duke et al. [15]	2015	USA	Cohort	Male/female adult smokers	4040	N	Smoking knowledge, beliefs, intention	Negative messages increase worry about health and smoking risks and intention to quit.
Durkin et al. [19]	2011	Australia	Cohort	Male/female smokers 18−39 y/o	33,719	N	Calls to quitline	Combination of high-emotion and narrative negative messages were associated with greatest increase in calls to quitline.
Farrelly et al. [7]	2012	USA	Cohort	Male/female adult smokers	8780	N/P	Quit attempts	Negative messages were associated with desire to quit and quit attempts. Positive messages had no effect.
Farrelly et al. [20]	2013	USA	Cohort	Male/female adult smokers	N/A	N	Calls to quitline	Messages highlighting the health consequences of smoking and second-hand smoke increase calls to quitline.

(continued on next page)

. (continued)

Author(s)	Year	Country	Design	Participants	n	Message	Outcome measures	Results
Halkjelsvik and Rise [22]	2015	Norway	Cohort	Male/female smokers and non-smokers 18—75 y/o in USA	603	N/P	Smoking attitude, intention	Positive messages containing humour were rated as less fearful, disgusting, and sad than negative messages and were associated with less motivation to quit.
Huang et al. [16]	2015	USA	Cohort	Male/female smokers 18—64 y/o	1401	N	Smoking knowledge, behaviour	Negative messages were associated with increased knowledge of amputation and blindness but not heart attack.
Kandra et al. [24]	2013	USA	Cohort	Male/female 11-17 y/o, English speaking	1157	N	Smoking status, experimentation	Negative messages decreased current smoking and experimentation among high-sensation-seeking youth.
Leas et al. [3]	2015	USA	Cohort	Male/female smokers 18—39 y/o	2596	N/P	Smoking behaviour	Negative messages correlated with a higher probability of making a quit attempt than positive messages.
Li et al. [18]	2016	New Zealand	Cohort	Male/female adult smokers and recent quitters	180	N	Smoking knowledge, attitude, beliefs, behaviour	Negative messages targeted toward young adults were also associated with smoking related cognitions and quit attempts among older adults.
Mcafee et al. [17]	2013	USA	Cohort	Male/female adult smokers and non-smokers	5273	N	Quit attempts and smoking discussion	Negative messages increase quit attempts. This effect was larger among light smokers.
Nonnemaker et al. [21]	2013	USA	Cohort	Male/female adult smokers	193,449	N/P	Calls to quitline	Negative messages were associated with calls from people who were less ready to quit or have low confidence in quitting.
Richardson et al. [10]	2014	UK	Cohort	Men and women in England.	1,227,189	N/P	Calls to quitline	Both positive and negative messages increased calls to quitline, negative messages required greater exposure.
Vallone et al. [26]	2010	USA	Cohort	Male/female adult smokers	212	P	Smoking cognitions, behaviour, confidence quitting	Awareness of positive messages increased smoking cognitions but not confidence quitting or quit attempts.

Note: N = negative, P = positive, y/o = year old, n = number of participants, USA = United States of America, UK = United Kingdom.
Note: Participants includes gender, age, and smoking status, where specified by the artic.

References

[1] World Health Organisation [WHO]. WHO report on the global tobacco epidemic 2021: addressing new and emerging products. Geneva: WHO; 2021.
[2] Australian Bureau of Statistics [ABS]. Causes of death, Australia [updated 2018; cited 2021 Jun]. Available from: https://www.abs.gov.au/ausstats/abs@.nsf/mf/3303.0.
[3] Leas EC, Myers MG, Strong DR, Hofstetter CR, Al-Delaimy WK. Recall of anti-tobacco advertisements and effects on quitting behavior: results from the California smokers cohort. Am J Publ Health 2015;105(2):e90—7. https://doi.org/10.2105/AJPH.2014.302249.
[4] Doll R, Peto R, Boreham J, Sutherland I. Mortality in relation to smoking: 50 years' observations on male British doctors. BMJ 2004;328(7455):1519. https://doi.org/10.1136/bmj.38142.554479.AE.
[5] Durkin S, Brennan E, Wakefield M. Mass media campaigns to promote smoking cessation among adults: an integrative review. Tobac Contr 2012;21(2):127—38. https://doi.org/10.1136/tobaccocontrol-2011-050345.

[6] Cowling DW, Modayil MV, Stevens C. Assessing the relationship between ad volume and awareness of a tobacco education media campaign. Tobac Contr 2010;19(Suppl 1):i37—42. https://doi.org/10.1136/tc.2009.030692.
[7] Farrelly MC, Duke JC, Davis KC, Nonnemaker JM, Kamyab K, Willett JG, et al. Promotion of smoking cessation with emotional and/or graphic antismoking advertising. Am J Prev Med 2012;43(5):475—82. https://doi.org/10.1016/j.amepre.2012.07.023.
[8] Yom-Tov E, Muennig P, El-Sayed AM. Web-based anti-smoking advertising to promote smoking cessation: a randomized controlled trial. J Med Internet Res 2016;18(11):e306. https://doi.org/10.2196/jmir.6563.
[9] Farrelly MC, Hussin A, Bauer UE. Effectiveness and cost effectiveness of television, radio and print advertisements in promoting the New York smokers' quitline. Tobac Contr 2007;16(Suppl 1):i21—3. https://doi.org/10.1136/tc.2007.019984.
[10] Richardson S, Langley T, Szatkowski L, Sims M, Gilmore A, McNeill A, et al. How does the emotive content of televised anti-smoking mass media campaigns influence monthly calls to the NHS Stop Smoking helpline in England? Prev

Med 2014;69:43−8. https://doi.org/10.1016/j.ypmed.2014.08.030.

[11] Liberati A, Altman DG, Tetzlaff J, Mulrow C, Gotzsche PC, Ioannidis JP, et al. The PRISMA statement for reporting systematic reviews and meta-analyses of studies that evaluate health care interventions: explanation and elaboration. J Clin Epidemiol 2009;62(10):e1−34. https://doi.org/10.1016/j.jclinepi.2009.06.006.

[12] Goldman KD, Schmalz KJ. The Matrix Method of literature reviews. Health Promot Pract 2004;5(1):5−7. https://doi.org/10.1177/1524839903258885.

[13] Critical Appraisal Skills Programme [CASP]. 10 Questions to help you make sense of qualitative research. Oxford: CASP; 2010.

[14] Davis KC, Nonnemaker J, Duke J, Farrelly MC. Perceived effectiveness of cessation advertisements: the importance of audience reactions and practical implications for media campaign planning. Health Commun 2013;28(5):461−72. https://doi.org/10.1080/10410236.2012.696535.

[15] Duke JC, Davis KC, Alexander RL, MacMonegle AJ, Fraze JL, Rodes RM, et al. Impact of a U.S. antismoking national media campaign on beliefs, cognitions and quit intentions. Health Educ Res 2015;30(3):466−83. https://doi.org/10.1093/her/cyv017.

[16] Huang LL, Thrasher JF, Abad EN, Cummings KM, Bansal-Travers M, Brown A, et al. The U.S. National Tips from Former Smokers antismoking campaign: promoting awareness of smoking-related risks, cessation resources, and cessation behaviors. Health Educ Behav 2015;42(4):480−6. https://doi.org/10.1177/1090198114564503.

[17] McAfee T, Davis KC, Alexander Jr RL, Pechacek TF, Bunnell R. Effect of the first federally funded US antismoking national media campaign. Lancet 2013;382(9909):2003−11. https://doi.org/10.1016/s0140-6736(13)61686-4.

[18] Li J, Guiney H, Walton D. Evidence for a young adult-targeted tobacco control campaign stimulating cessation-related responses among adult smokers and recent quitters. N Z Med J 2016;129(1430):51−62.

[19] Durkin SJ, Wakefield MA, Spittal MJ. Which types of televised anti-tobacco campaigns prompt more quitline calls from disadvantaged groups? Health Educ Res 2011;26(6):998−1009. https://doi.org/10.1093/her/cyr048.

[20] Farrelly M, Mann N, Watson K, Pechacek T. The influence of television advertisements on promoting calls to telephone quitlines. Health Educ Res 2013;28(1):15−22. https://doi.org/10.1093/her/cys113.

[21] Nonnemaker JM, Farrelly MC, Kamyab K, MacMonegle AJ. Do different styles of antismoking ads influence the types of smokers who call quitlines? Health Educ Res 2013;28(1):23−30. https://doi.org/10.1093/her/cys080.

[22] Halkjelsvik T, Rise J. Disgust in fear appeal anti-smoking advertisements: the effects on attitudes and abstinence motivation. Drugs (Abingdon Engl). 2015;22(4):362−9. https://doi.org/10.3109/09687637.2015.1015491.

[23] Duke JC, Nonnemaker JM, Davis KC, Watson KA, Farrelly MC. The impact of cessation media messages on cessation-related outcomes: results from a national experiment of smokers. Am J Health Promot 2014;28(4):242−50. https://doi.org/10.4278/ajhp.120920-QUAN-452.

[24] Kandra KL, McCullough A, Summerlin-Long S, Agans R, Ranney L, Goldstein AO. The evaluation of North Carolina's state-sponsored youth tobacco prevention media campaign. Health Educ Res 2013;28(1):1−14. https://doi.org/10.1093/her/cys085.

[25] Martin CA, Kelly TH, Rayens MK, Brogli BR, Brenzel A, Smith WJ, et al. Sensation seeking, puberty, and nicotine, alcohol, and marijuana use in adolescence. J Am Acad Child Adolesc Psychiatry 2002;41(12):1495−502. https://doi.org/10.1097/00004583-200212000-00022.

[26] Vallone DM, Duke JC, Mowery PD, McCausland KL, Xiao H, Costantino JC, et al. The impact of EX: results from a pilot smoking-cessation media campaign. Am J Prev Med 2010;38(3 Suppl):S312−8. https://doi.org/10.1016/j.amepre.2009.11.021.

[27] Anderson CM, Zhu SH. Tobacco quitlines: looking back and looking ahead. Tobac Contr 2007;16(Suppl 1):i81−6. https://doi.org/10.1136/tc.2007.020701.

[28] Farrelly MC, Healton CG, Davis KC, Messeri P, Hersey JC, Haviland ML. Getting to the truth: evaluating national tobacco countermarketing campaigns. Am J Publ Health 2002;92(6):901−7. https://doi.org/10.2105/ajph.92.6.901.

[29] Wakefield MA, Spittal MJ, Yong HH, Durkin SJ, Borland R. Effects of mass media campaign exposure intensity and durability on quit attempts in a population-based cohort study. Health Educ Res 2011;26(6):988−97. https://doi.org/10.1093/her/cyr054.

[30] Rosenstock IM. Historical origins of the health belief model. Health Educ Monogr 1974;2(4):328−35. https://doi.org/10.1177/109019817400200403.

[31] Rogers RW. Cognitive and physiological processes of fear appeals and attitude change: a revised theory of protection motivation. In: Cacioppo JT, Petty RE, editors. Social psychophysiology: a sourcebook. New York: Gilford Press; 1983. p. 153−76.

[32] Chung H, Ahn E, Kang S. Processing anti-smoking ads among college students: the role of emotional response and level of smoking. J Promot Manag 2016;22(3):370−85. https://doi.org/10.1080/10496491.2016.1154918.

[33] Orji R, Vassileva J, Mandryk R. Towards an effective health interventions design: an extension of the health belief model. Online J Publ Health Inform 2012;4(3). https://doi.org/10.5210/ojphi.v4i3.4321.

[34] Elshatarat RA, Yacoub MI, Khraim FM, Saleh ZT, Afaneh TR. Self-efficacy in treating tobacco use: a review article. Proc Singap Healthc 2016;25(4):243−8. https://doi.org/10.1177/2010105816667137.

[35] Yang DJ. Exploratory neural reactions to framed advertisement messages of smoking cessation. Soc Market Q 2018;24(3):216−32. https://doi.org/10.1177/1524500418788306.

[36] Lobato R. Streaming services and the changing global geography of television. In: Warf B, editor. Handbook on geographies of technology. Cheltenham, UK: Edward Elgar Publishing; 2017. p. 178−92.

[37] Spangler T. Netflix is no. 1 choice for tv viewing, beating broadcast, cable and youtube (study) [updated 2018 Jul 3; cited 2021 Jun]. Available from: https://variety.com/2018/tv/news/netflix-tv-survey-broadcast-cable-youtube-1202864459.

[38] Rath JM, Bennett M, Vallone D, Hair EC. Content analysis of tobacco in episodic programming popular among youth and young adults. Tobac Contr 2020;29(4):475−9. https://doi.org/10.1136/tobaccocontrol-2019-055010.

[39] Arora M, Nazar GP, Chugh A, Rawal T, Shrivastava S, Sinha P, et al. Tobacco imagery in on-demand streaming content popular among adolescents and young adults in India: implications for global tobacco control. Tobac Contr 2021;30(1):42−8. https://doi.org/10.1136/tobaccocontrol-2019-055360.

[40] Zawawi D, Dick CJ. Tak Nak (Say No) anti-smoking television advertisement: is it influential enough to stop smoking? Pertanika J Soc Sci Humanit 2013;21(Special):171−88.

[41] Donaldson SI, Grant-Vallone EJ. Understanding self-report bias in organizational behavior research. J Bus Psychol 2002;17(2):245−60. https://doi.org/10.1023/A:1019637632584.