

Effectiveness of Mass Media Campaigns in Reducing the Consumption of Smokeless Tobacco in India: A systematic review

Abstract

Background: Smokeless tobacco consumption is a particularly significant problem in India with one of the highest prevalence of smokeless tobacco users in the world. Several anti-tobacco mass media campaigns have been launched that have aimed at raising awareness and informing people about the adverse health effects of consuming smokeless tobacco.

Aim: The objective of this study was to conduct a systematic review of research articles that quantified the number of people in India who intended, attempted, and took serious steps to reduce or quit consumption of smokeless tobacco products after being influenced by mass media campaigns.

Methods: Original research articles that described the rates of people who intended to quit consumption and who discontinued consumption of smokeless tobacco products after viewing mass media campaigns were extracted from PubMed and Science Direct databases for the years 2010 to 2020. Risk of bias was assessed for the selected articles and data pertaining to the research question was extracted from the studies.

Results: A total of 7 studies met the inclusion criteria. On average 50% of study participants expressed a strong desire to give up smokeless tobacco consumption. Additionally, media channels such as television, public transport, and public places were more influential in encouraging people to quit smokeless tobacco consumption.

Conclusion: Anti-tobacco mass media campaigns in India have a considerable influence on smokeless tobacco users by raising their awareness, instilling negative attitudes, and encouraging discontinuation of smokeless tobacco consumption.

Background

Tobacco consumption, in some form or other, is considered the second leading cause of death in the world, with a person dying from a tobacco-related disease every 6.5 seconds (Etu et al., 2017). Smokeless tobacco consumption is a form of tobacco consumption that does not involve burning; rather, it is done through sniffing, sucking, and chewing (Klus et al., 2009). Smokeless tobacco products are widely divided into orally and nasally used products with several subtypes based on their toxicity levels and carcinogenic potential. Due to extreme variations in the properties of various products available, smokeless tobacco is widely regarded as a heterogeneous material, making it difficult to treat or manage addiction (Klus et al., 2009). In contrast to smoking cigarettes, consumption of smokeless tobacco results in direct absorption of nicotine through the mucous membranes of the nose and mouth. Thus, the amount of nicotine absorbed by smokeless tobacco products is much higher compared to the amount of nicotine consumed through smoking cigarettes (Etu et al., 2017). Apart from its adverse health effects, smokeless tobacco presents a global economic health burden as it increases the health costs of smokeless tobacco users resulting in poverty (Etu et al., 2017). Every year, around 4.9 million deaths occur due to tobacco consumption and this number is expected to rise to 8.3 million by 2030 (Etu et al., 2017). Currently, there are around 300 million users of smokeless tobacco products worldwide (Etu et al., 2017). Some of the common diseases caused by excessive tobacco consumption include oral, lung, and nasopharyngeal cancers (Etu et al., 2017). Apart from cancers, smokeless tobacco consumption may lead to oral mucosal lesions or oral leukoplakias, gingival recession, cardiovascular and peripheral vascular disease, fetal mortality, hypertension, and peptic ulcers. The specific health effects in people vary based on the properties of the specific product being consumed (Critchley and Unal, 2003).

Among the developing countries, India is a major part of the international tobacco industry (Joshi, 2006). It is currently the third largest tobacco producer and eighth largest tobacco exporter in the world (Joshi, 2006). It accounts for around 6% of the tobacco world trade with its production increasing every year (Joshi, 2006). It has been estimated that smokeless tobacco products are consumed by around 21.4% of the Indian population (Mohan et al., 2018). This accounts for the largest number of users of smokeless tobacco products among 120 countries in the world where these products are used. Out of 346 million people consuming smokeless tobacco products worldwide, 80.8 million alone are found in India

(Mohan et al., 2018). This presents a very large health and economic burden for the country which is estimated at 22.4 billion US dollars annually (Mohan et al., 2018).

One strategy that has been instrumental in both increasing and decreasing usage of smokeless tobacco products among consumers is mass media campaigns (Elizabeth, 2016). Some of the common types of mass media campaigns include consumer-oriented advertising, targeted promotion, and stakeholder-level marketing (Elizabeth, 2016). As the majority of smokeless tobacco products users belong to the younger age group, mass media is considered a very effective tool in convincing the youth about the dangerous health effects of consuming these products (Elizabeth, 2016). It is an important means by which the knowledge, behaviours, and attitudes of consumers can be directly influenced (Elizabeth, 2016). This medium has been used by several countries to launch comprehensive tobacco control programs to encourage the youth to give up using smokeless tobacco products (Elizabeth, 2016). Mass media campaigns have often been used in conjunction with policy changes, cessation treatment, educational programs, and grassroots activism (Elizabeth, 2016).

Due to the rampant usage of smokeless tobacco products in India, the Indian government has launched several mass media campaigns to reduce the consumption rates of these products in the country (Turk et al., 2012). The objectives of these campaigns have varied from increasing knowledge and awareness to enhancing risk perceptions among consumers (Turk et al., 2012). The media used for these campaigns included public service announcements on radio and television which included testimonials from surgeons working in cancer wards and patients affected with diseases related to smokeless tobacco products (Turk et al., 2012). Care has been taken to ensure that the channels used for communication were accessible to people living in rural areas, women, and people belonging to low-income families (Turk et al., 2012).

Another medium by which messages related to the dangers of using smokeless tobacco products has been communicated to consumers is social media (Murukutla et al., 2011). However, social media marketing campaigns have not been as successful in India as compared to developed countries, mainly due to lack of access to social media in rural and low-income groups of smokeless tobacco consumers (Murukutla et al., 2011). This is slowly changing in the past few decades due to a majority of the users falling in the adolescent age range and increased use of social media amongst adolescents (Murukutla et al., 2011).

The first ever mass media campaign conducted by the Indian Government against consumption of smokeless tobacco products took place in 2009 in conjunction with the World Lung Foundation (WLF) (Murukutla et al., 2011). This has been followed by several campaigns by the government to disseminate anti-tobacco messages in different forms to consumers (Murukutla et al., 2011). Several studies have shown that the use of mass media campaigns can lead to increased awareness about the dangers and risks of consuming smokeless tobacco products (Singhavi & Chaturvedi, 2019). However, the role and effectiveness of mass media campaigns in promoting reduced consumption of these products among consumers is not yet clear (Singhavi & Chaturvedi, 2019).

Objectives of the Study

This study aims to assess the effectiveness of mass media campaigns to reduce consumption of smokeless tobacco products in India. It aims to identify the change in attitudes and behaviours in the consumption of smokeless tobacco products and attempt to quantify the number of people who show a strong intention to quit or reduce consumption of smokeless tobacco products after viewing messages delivered through mass media campaigns.

Rationale of the Study

India has a very large consumer base of smokeless tobacco products and this presents an immense health and economic burden to the nation (Singhavi & Chaturvedi, 2019). Most smokeless tobacco product users fall in the younger age group comprising of children and adolescents (Singhavi & Chaturvedi, 2019). Consequentially, an increased usage of smokeless tobacco products in this age group affects their employability and productivity, having long-standing impacts on the development of the country. This is due to the myriad of health diseases including cancers that are associated with increased smokeless tobacco consumption. Hence, it is extremely important to understand the ways by which smokeless tobacco consumption can be reduced in the population and specifically understand the effectiveness of mass media campaigns in bringing about this reduction.

Methods

Study design

Search Strategy

PubMed and Science Direct databases were searched for relevant articles using the search terms: mass media campaigns, smokeless tobacco products, smokeless tobacco consumption,

and India. Eligibility criteria were peer-reviewed original research articles within the year of publication between 2010 and 2020. Inclusion criteria were articles that explicitly reported intention and attempts to quit using smokeless tobacco products and articles that studied the effects of anti-smokeless tobacco mass media campaigns specifically. The outcome measures used to determine the effectiveness of the articles were quantification of people who reduced or discontinued consumption of smokeless tobacco products following exposure to mass media campaigns. The exclusion criteria for the articles were articles that were not original research articles but were reviews of other articles, and articles that merely reported awareness levels in the public following mass media campaigns regarding consumption of smokeless tobacco products. Articles that studied the effects of pro-tobacco advertisements or general use of media were excluded from the review. The references of the selected articles were also scanned to find other relevant articles to include in the review.

Data Extraction

Each of the selected articles was read completely for details on the effectiveness of mass media campaigns in the reduction of smokeless tobacco products consumption. Details such as specific mass media campaigns that were investigated, areas that were considered, and population groups that were considered were noted. The data obtained in relation to reduction in consumption rates of smokeless tobacco products was classified according to the above mentioned categories into three groups: percentage of people who expressed an intention to quit smokeless tobacco consumption, percentage of people who reduced smokeless tobacco consumption, and percentage of people who discontinued smokeless tobacco consumption.

Risk of Bias Assessment

This review only utilised data from published studies and did not attempt to perform a more comprehensive data collection and analysis through private communication with authors and other stakeholders. Hence, only published data informed the results of this systematic review which may have resulted in reporting of positive findings only and may have eliminated statistically non-significant data from the review. Once the studies to be included for the review were finalised, the methods employed in each article in terms of sample selection, and assessment of reduced smokeless tobacco consumption in the form of self-reported surveys and duration of follow-up were analyzed to identify any selection bias in the studies. The funding source of the studies was also checked to see if it was the government, tobacco industry, or another key stakeholder.

Results

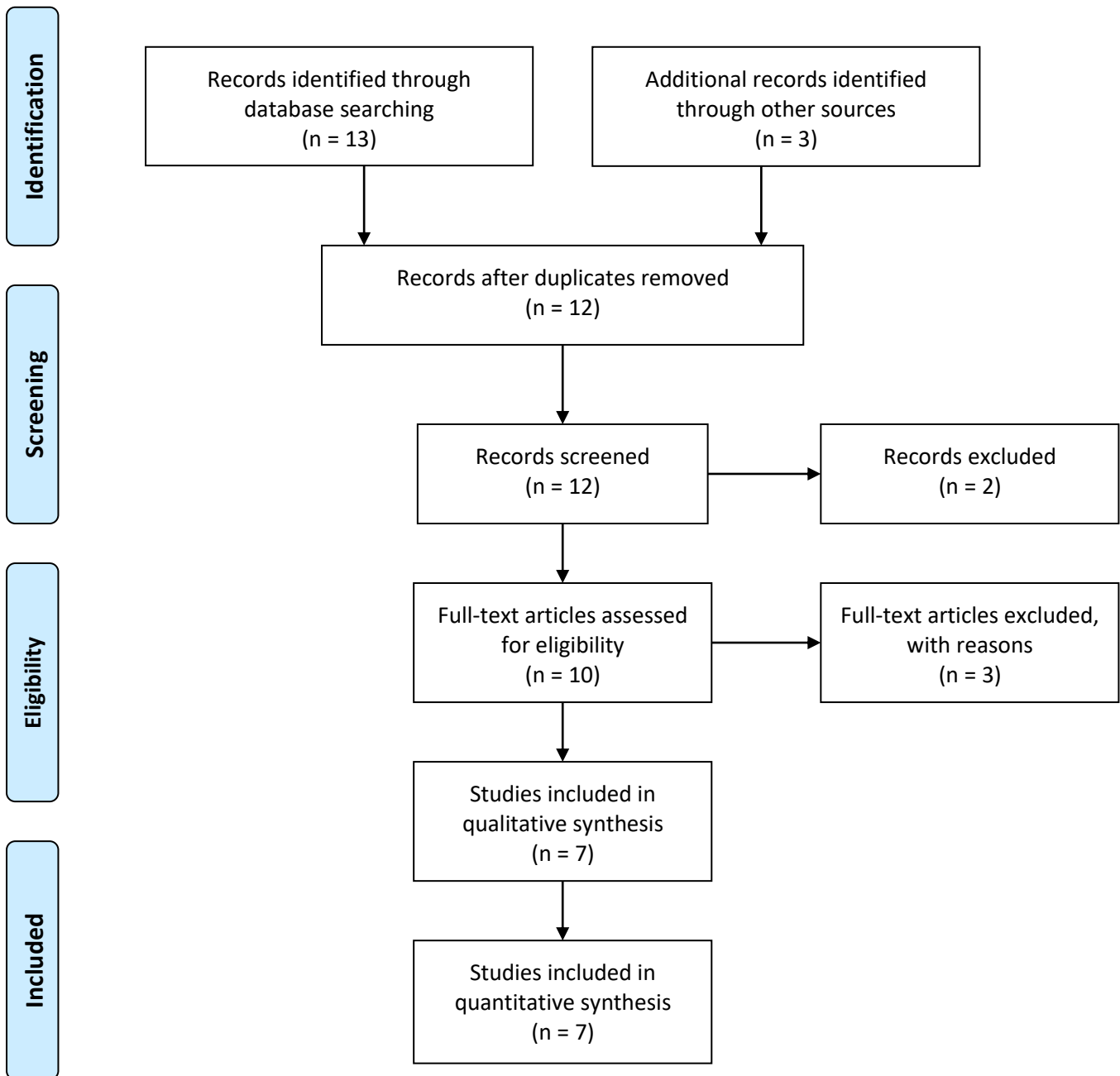


Figure 1: PRISMA flow diagram with details about the search strategy

Features of Studies Included in the Systematic Review

Out of the 16 studies that were identified initially, one study (Madewell and Kolaja, 2019) that analysed the results of two Global Adult Tobacco Surveys (GATS) with respect to reduction in smokeless tobacco consumption was also included in the review. Some of the

studies surveyed specific districts or population groups in the country while some used nationally representative samples for the survey. Studies that merely reported awareness levels regarding adverse health effects of smokeless tobacco consumption and media channels that were most effective in raising awareness were not included in the review. Studies that considered other factors such as understanding of specific graphics and phrases used in campaign messages were also removed. Finally, 7 studies remained (Table 1).

Table 1: Characteristic features of included studies

| Name of Study | Population Studied | Age (years) | Sample Size | Sampling Method | Data Collection Method |
|----------------------------|----------------------------------------------------------------------|--------------------|--------------------|----------------------------------------|--------------------------------------------|
| Begum et al., 2017 | Married women in low-income slum community in western area of Mumbai | 18 - 40 | 409 | Systematic random sampling | Structured questionnaire |
| Bhargava and Bhowate, 2017 | Rural and urban regions of Nagpur and Wardha districts | 16 - 75 | 1010 | Universal sampling | Face to face interviews |
| Bhat et al., 2018 | Urban areas in South Bangalore | 18 - 25 | 250 | Random sampling | Self-administered questionnaire |
| Gadiyar et al., 2018 | Pre-university students in Belgaum | 16 - 18 | 600 | Random sampling | Self-structured close-ended questionnaire |
| Madewell and Kolaja, 2019 | Participants of GATS-1 and GATS-2 surveys | 15 and above | 69,296; 74,037 | Multi-stage cluster sampling | Household surveys |
| Murukutla et al., 2011 | Nationally representative population | 16 - 50 | 2898 | Three-stage stratified random sampling | Nationally representative household survey |

| | | | | | |
|------------------------|--------------------------------------------------------------------|---------|------|--------------------|-----------------------------|
| Philip et al., 2013 | School children of government and aided schools in Kannur | 13 - 17 | 4144 | Random sampling | Structured questionnaire |
|------------------------|--------------------------------------------------------------------|---------|------|--------------------|-----------------------------|

All the 7 studies fell in the year range of 2011 to 2019, and explored the role of mass media campaigns in cessation of smokeless tobacco consumption. All were observational cross-sectional studies except one (Madewell and Kolaja, 2019) which was a secondary analysis of data from the GATS-1 and GATS-2 surveys. The sample sizes varied from as low as 250 and as high as 4,144. The sample sizes of the GATS-1 and GATS-2 surveys were 69,296 and 74,037 respectively as they were conducted on a large-scale national level.

Risk of bias assessment of included studies

With the exception of one study that used universal sampling method, all other studies used random sampling method for selection of participants for the surveys. Additionally, two studies used multi-stage random sampling methods for participant selection, thus eliminating selection bias in the studies. All studies reported having their prepared questionnaires validated by authoritative sources increasing the reliability of the data collection methods. Regarding outcome assessment, most studies used data from questionnaires given to the participants and this may have led to detection bias due to misinterpretation of questions, or misreporting of smokeless tobacco usage and reduction in consumption. The rates of usage of smokeless tobacco products were self-reported and no study reported smokeless tobacco consumption rates before and after exposure to mass media campaigns. As a result, the true usage and reduction rates may vary from the reported rates affecting study outcomes.

Effect of mass media campaigns on reduction of smokeless tobacco consumption

The results reported in the included studies were divided into three categories as shown in Table 2 – the percentage of people who reported an intention to quit smokeless tobacco consumption, the percentage of people who made attempts to quit or who reported a reduction in smokeless tobacco consumption, and the percentage of people who reported completely discontinuing smokeless tobacco consumption. The rates of people who expressed an intention to quit varied from 28% to 83.27%, with most studies reporting rates of about 50% of people expressing an intention to quit smokeless tobacco consumption. The lowest rate of 28% was reported among participants from the urban South Bangalore district

of Karnataka whereas the highest rate of 83.27% was reported among participants from the Nagpur and Wardha districts of Maharashtra. In the second category of people who made attempts to quit or reported a reduction in consumption of smokeless tobacco products, the rates varied from 23% to 32% distributed across three studies. Three studies reported percentages of people who gave up smokeless tobacco consumption after viewing mass media campaigns, with one study reporting 1.7% and two studies reporting 49% and 50%.

Table 2: Results of effects of mass media campaigns on intention to quit and quitting of smokeless tobacco consumption

| Name of Study | Percentage of people with intention to quit | Percentage of people who reduced or attempted to quit | Percentage of people who quit | Media channel(s) linked to intention to quit |
|----------------------------|----------------------------------------------------|--------------------------------------------------------------|--------------------------------------|-------------------------------------------------------------------------------------------------------|
| Begum et al., 2017 | 67 | | | Television |
| Bhargava and Bhowate, 2017 | 83.27 | | 1.7 | Public places, television, public transport, movie halls, camps |
| Bhat et al., 2018 | 28 | 23 | 49 | |
| Gadiyar et al., 2018 | 51.5 | | | |
| Madewell and Kolaja, 2019 | 49.5 | 32 | | Product packages, newspapers, magazines, billboards, cinema halls, vehicles, walls, television, radio |
| Murukutla et al., 2011 | 51 | 28 | | |
| Philip et al., 2013 | | | 50 | |

Mass media channels linked to quitting smokeless tobacco consumption

Two studies (Begum et al., 2017; Bhargawa and Bhowate, 2017) reported television to be the most important media for anti-smokeless tobacco campaigns that influence decisions to reduce or quit consumption, with one of the studies reporting television to be linked to intention to quit smokeless tobacco consumption in 71% of the participants. Other influential channels included advertisements in public places and public transport. Apart from these, newspapers and magazines, cinemas, billboards, public walls, radio, and camps were also influential in encouraging people to quit smokeless tobacco consumption.

Discussion

Our findings suggest that use of anti-tobacco mass media campaigns by government and other organizations has a reasonable effect in encouraging people to quit or reduce smokeless tobacco consumption. The reported rates are as high as 50% for intention to quit as well as discontinuing smokeless tobacco consumption. This is a reasonably high number of people who are influenced by mass media campaigns to change their smokeless tobacco consumption habits. Among the media channels, television and public places such as billboards on walls and advertisements on public transport were extremely influential in increasing people's awareness and influencing them to quit smokeless tobacco consumption.

Regarding the mass media campaigns, most of the studies used self-structured questionnaires that asked the participants to state specific campaigns, advertisements, and initiatives that influenced their decision to reduce or quit smokeless tobacco consumption. For example, Begum et al. (2017) specifically asked their participants what they understood by the image of the scorpion printed on smokeless tobacco products. They were also asked their source(s) of information regarding smokeless tobacco consumption, and about 36% reported television to be their primary source of information. Bhat et al. (2018) interviewed participants who had watched anti-tobacco advertisements promoted by the Indian Government and found that around 49% of the participants discontinued smokeless tobacco consumption after watching the advertisements. Gadiyar et al. (2018) reported a positive change in attitude towards reduction in smokeless tobacco consumption in up to 90% of the participants after watching advertisements and statutory warnings in cinema halls. Philip et al. (2013) designed an anti-tobacco mass media campaign specifically designed for school children that was delivered to them in the school setting. In contrast, Murukutla et al. (2011) studied the effects of a government-initiated mass media campaign that was aired on

television and radio for six weeks. Both these studies found that a considerable percentage of people were influenced by the information provided in these campaigns and decided to quit smokeless tobacco consumption.

Several studies have reported varying rates of the intention to quit consumption of smokeless tobacco products after viewing mass media campaigns. The results vary based on the specific population assessed, rural or urban area of location, age group, gender, and education and employment rates. Mass media campaigns initiated by the Indian government have been shown to be linked to an increase in negative attitudes towards smokeless tobacco and awareness about the adverse health effects of smokeless tobacco consumption (Singhavi and Chaturvedi, 2019). However, studies related to cessation of consumption of smokeless tobacco products among different population groups in different parts of India are lacking. So far, comprehensive analysis of smokeless tobacco users has only been conducted in Maharashtra (Begum et al., 2017; Bhargava and Bhowate, 2017), Karnataka (Bhat et al., 2018; Gadiyar et al., 2018), and Kerala (Philip et al., 2013).

The World Health Organization launched the GATS household surveys in different countries to assess the impacts of mass media campaigns on reduction and/or cessation of smokeless tobacco consumption. This survey used a nationally representative sample and household surveys to reach as many smokeless tobacco users as possible for the survey. As per this survey, around 49.5% of the participants expressed an intention to quit and around 32% made attempts to reduce or quit smokeless tobacco consumption (Madewell and Kolaja, 2019). This rate has been reported by other studies as well (Gadiyar et al., 2018; Murukutla et al., 2011) which confirms that approximately half the people who view anti-tobacco mass media campaigns end up reducing or quitting consumption of smokeless tobacco products.

Limitations of the review

Overall, this review is not nationally representative and is biased towards certain states and districts in India. This is because data from every state and district in India regarding influence of mass media campaigns in reducing consumption of smokeless tobacco products is lacking. Also, representation of different population groups is uneven, as only one study analyzes consumption habits of women, one study analyzes school children, and one study analyzes college students. Hence, the results of this review cannot be extrapolated to all population groups due to lack of evidence in the literature.

Implications for policy and practice

Despite gaps in the literature, this review has suggested around 50% cessation rates for the consumption of smokeless tobacco products after viewing mass media campaigns. This result is significant as it points towards the effectiveness of mass media campaigns in bringing about a change in people's mindsets. Hence, this is a strong indicator for government and non-government organizations to increase mass media campaigns targeted for both rural and urban populations, and for adolescents in schools and colleges. The media channels that have been reported to have the most influence on smokeless tobacco consumption habits in people include television, public transport, and public places, and these channels should be made use of to the maximum extent for mass media campaigns.

Conclusion

In conclusion, mass media campaigns have considerable influence in encouraging people to reduce or quit using smokeless tobacco products. Different studies have reported rates of around 50% of reduction and cessation of consumption of smokeless tobacco products. Additionally, mass media campaigns promoted using television, public transport, and public places have been shown to have more influence in changing people's behaviours as compared to other media channels. This review has served to address an important gap in the literature regarding the number of people who give up consumption of smokeless tobacco products after viewing mass media campaigns. Although the studies are not representative of all districts and population groups in India, the results are, nevertheless, significant as they point towards a positive effort in giving up smokeless tobacco consumption by people under the influence of mass media campaigns.

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