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SYSTEMATIC REVIEW

A Systematic Review about Educational Campaigns on Smoking Cessation

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Abstract:

Background:

Health campaigns have been shown effective in the prevention of smoking. These campaigns convey messages about specific behavior to the audience and have a high penetration rate.

Objective:

This systematic review was conducted to summarize the effect of educational campaigns on smoking.

Methods:

The PubMed, Web of Science, Scopus, Embase, Google Scholar databases were searched on 16 March, 2019 by using the keywords "Waterpipe, Hookah, Shisha, Cigarette, Smoking" and "Campaign, Antismoking Campaign, Health campaign".

Results:

A total of 15 articles related to smoking campaigns entered the review. Campaigns were divided into two broad categories: (1) Campaigns aimed at public education and social change; (2) Campaigns aimed at changing policy or attracting the attention of politicians. The largest campaign was conducted in England. All educational campaigns showed at least one positive effect on preventing and controlling smoking.

Conclusion:

Anti-smoking campaigns are important investments, and as part of comprehensive tobacco control programs, they can educate people about the harms of smoking, change smoking attitudes and beliefs, increase quitting intentions, promote quitting, and decrease smoking.

Keywords: Systematic review, Smoking, Health, Campaigns, Cigarette, Public education.

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1. INTRODUCTION

Tobacco is one of the most important causes of non-communicable diseases (NCD) and is responsible for premature deaths [1]. One in ten global deaths, and the second major cause of mortality in the world is tobacco use [2]. Smoking was uncommon in the 1900s, but smoking rates increased substantially in many countries during the first half of the 20th century, among men and later on among women as well [3].

Scientific literature indicates a prevalence between 12 to 57% of tobacco smoking in different world populations [4, 5].

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The risks of smoking in middle age are much greater for smokers who started in early adulthood than those who started later. This means that the ratio of mortality among smokers to people who have never smoked is much higher now than what it was half a century earlier when the epidemic of smoking-attributable deaths was at an earlier stage [6].

Tobacco smoke includes more than 4,000 different chemical substances, in which more than 40 of them are carcinogenic [7]. The high density of carbon monoxide, tar, nicotine, and heavy metals in tobacco smoke can cause cardiovascular disease, oral and lung cancer, decreased respiratory function, and reduced fertility [8].

Studies have shown a strong scientific and medical necessity for reducing tobacco use, and this can help improve

the health of millions of people and can stop the development of many diseases [9]. Intervention trials have been effective in the prevention of smoking [9], and have been reviewed in some previous articles [10].

One of the educational strategies for promoting public health is conducting health campaigns. The aim of a health campaign is to increase the quality, availability, and effectiveness of health programs [11]. These campaigns include a series of educational activities with coordinated information and communication, and by using a combination of multiple and diverse channels, they transmit information and specific messages to a population within a predetermined period, and in line with the objectives of the program. Health campaigns invite people and authorities for public participation and to focus on collective interests [12].

An important reason for designing health education campaigns is that health and quality of life not only depend on proper medical and health care but also on many social factors. These trainings can be done in four major settings: schools, workplaces, health centers, and community centers [13].

The tobacco industry spends millions of dollars each year to advertise and promote cigarettes in the world. However, public health advocates have found that anti-smoking campaigns are powerful and pervasive in promoting public health [14]. Over the past decade, several studies have examined the effect of mass media campaigns for delivering messages about smoking prevention [15]. This systematic review tried to identify and summarize the results of educational campaigns against smoking.

2. MATERIALS AND METHODS

2.1. Search Strategies

Articles related to tobacco campaigns were searched in the databases of PubMed, Web of Science, Scopus, Embase, and Google Scholar, on 16 March, 2019. The keywords used were "Campaign or anti-smoking campaign or health campaign" and "Tobacco, cigarettes, hookah, water pipe, or shisha." No time limit was applied for searching.

2.2. Inclusion and Exclusion Criteria

The included studies were campaign-based interventions, conducted only for tobacco prevention or control. Review articles and studies that did not include an educational campaign were excluded.

2.3. Quality Assessment

The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) was used, which is an evidence-based minimum set of items for reporting in systematic reviews and meta-analyses [16]. The PRISMA checklist contains 27 items related to the content of studies, including abstracts, methods, results, discussions, and financial resources [17].

2.4. Extracting Data

Two authors (RS and SM) reviewed the articles and abstracts retrieved from the electronic literature search. Full-text articles of potentially relevant references were scanned and independently assessed for eligibility as well. In case of disagreement between authors, a third arbitration was used.

Data were extracted from selected papers according to a standard form. This form included the names of the authors, the year of study, the location of the study, population characteristics, the purpose of the study, the description of the intervention, media channels, and the most important findings.

3. RESULTS

After searching the electronic databases, 3645 related articles were retrieved. Almost 2634 articles were duplicates and hence were deleted. From the remaining 1011 articles, 895 were excluded because they were reviews or did not include an educational campaign. 101 studies were excluded because they had low PRISMA scores (less than 15), or they aimed to prevent several risk factors such as smoking, alcohol, and illicit drugs simultaneously. Eventually, 15 studies were selected for the review (Fig. **1**).

The studies included in this systematic review are summarized in Table **1**. In this table, the characteristics of 15 articles, including the first author, year, place of study, population, the purpose of the study, intervention method and media channels, and results can be seen.

Eight campaigns were conducted in the USA, two in Australia, five in Europe, and one in Iran. The biggest population enrolled was in England, in which 1,227,189 people were enrolled [32], and the smallest number of participants was 235, enrolled in a study in Texas, US [20].

All studies showed at least one significant effect of the campaigns in reducing smoking rates and improving anti-smoking attitudes, beliefs, or behaviors. Mass media was used in all campaigns, except one [25], which used an educational package that consisted of different folders for the students, parents, and teachers.

4. DISCUSSION

Tobacco consumption has increased dramatically over recent years and has become a normal behavior in some societies [8]. However, the powerful impact of health campaigns can still be used to prevent and control smoking [33].

The campaigns evaluated in this review can be divided into two broad categories: (1) campaigns aimed at public education and social change; (2) studies aimed at altering policies or attracting the attention of politicians. In the first category of campaigns, preventing smoking and promoting quitting are important goals for comprehensive tobacco control programs that try to educate people about the harms of smoking, set the agenda for discussion, change smoking attitudes and beliefs, and increase quitting intentions and quit attempts [23, 27]. Educational campaigns should aim for big populations, and consistent exposure over a long timeframe, with a preference towards delivering messages that inform people about the adverse health effects of smoking [20]. In the second category, campaigns have attempted to decrease smoking rates by changing policies, influencing policymakers, and implementing

new tax initiatives or clean indoor air laws [34, 35]. The success of campaigns depends on the proper combination of these two categories, which means, along with educating the community, appropriate laws and policies should be set.

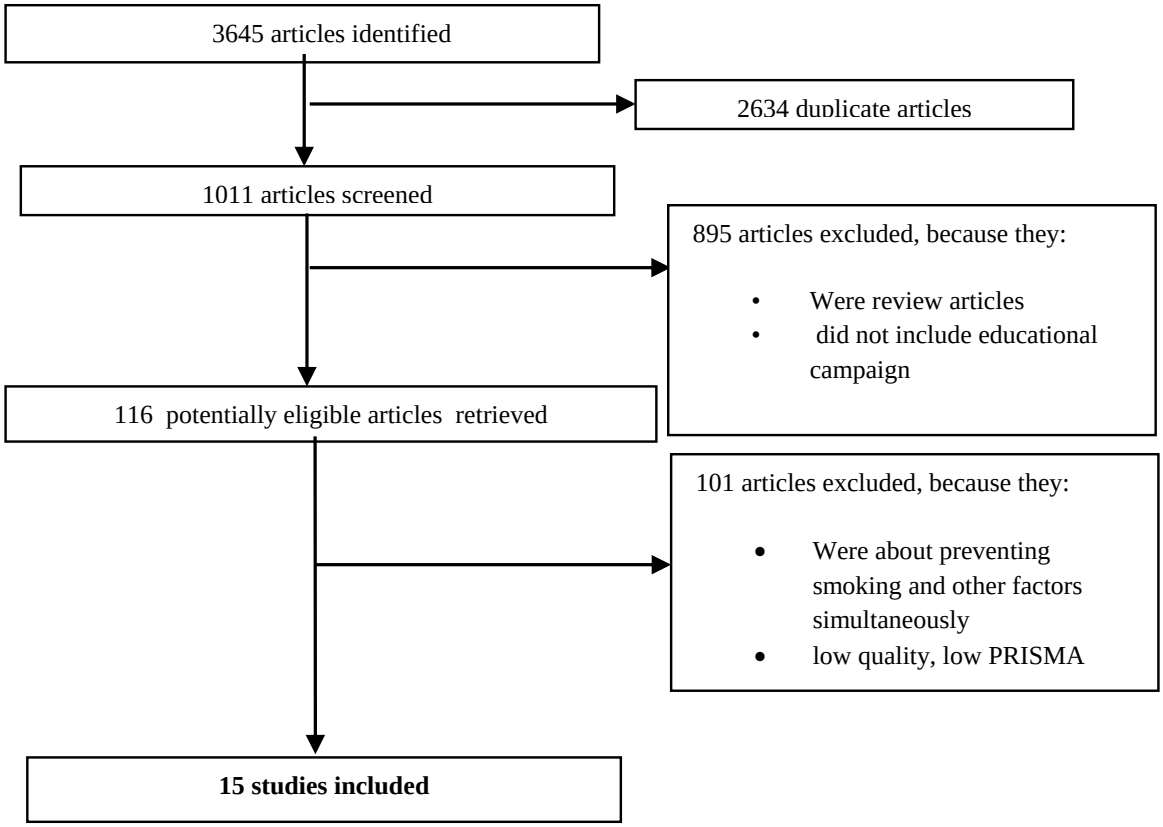

Fig. (1). Flowchart for selection of studies.

Table 1. Summary of articles included in this review.

Author / Publication year	Place/ Study Population	The Purpose of the Study	Intervention Method and Media Channels	Finding	PRISMA Score
Bauman, 1991 [18]	Metropolitan, USA; 2102 of adolescents and mothers	Evaluating the impact of mass media campaigns intended to prevent adolescent cigarette smoking.	Three mass media campaigns were performed. One used eight 30-second radio messages, that focused on 7 expected consequences of smoking. The second campaign included a 60-second radio message that invited people to enter the "I Won't Smoke Sweepstakes". The third campaign was similar to the second but included television broadcast of the sweepstakes offer and only 3 of the expected consequences messages.	The radio campaign had a modest influence on decreasing smoking and friend approval of smoking. The more expensive campaigns involving television were not more effective than those with radio alone. Between pretest and posttest, smoking decreased significantly (p= .014).	20

(Table 1) contd.....

Wakefield, 2008 [19]	Melbourne, Australia; 343835of Australian residents, 14 years or older	Assessing the impact of several tobacco control policies and televised antismoking advertising on adult smoking prevalence	People were exposed to anti tobacco television advertising, and changes in 3 tobacco control policies including increase in cigarette costs and smoke free restaurant laws.	Increases in cigarette costs and exposure to tobacco control media campaigns significantly reduced smoking prevalence. A 0.3%point reduction in smoking prevalence was reported by either exposing the population to televised antismoking ads at an average of almost 4 times per month or by increasing the cost of a pack of cigarettes. Monthly sales of nicotine replacement therapy (NRT) and bupropion, exposure to NRT advertising, and smoke-free restaurant laws had no detectable impact on smoking prevalence.	22
Smith, 2003 [20]	Texas, USA; 235 high school students	Testing the effectiveness of short-term (cosmetic) versus long-term (health fear)appeals in preventing or reducing smoking	Students were exposed to anti-smoking and filler advertisements weekly, throughout the semester through television, in magazines and on the internet.	The primary results were that average smoking declined for subjects exposed to the anti-smoking fear appeal but not for the control group and short-term cosmetic fear appeals were more effective for males but long-term health fear appeals were more effective for females.	21
White, 2003 [21]	National Tobacco Campaign, Australia; 4068 adolescents aged14–17	Examining adolescents' awareness and response to an adult focused anti-smoking advertising campaign	Adolescents were exposed to messages and an advertising campaign via television, in school and on the internet.	Among the national evaluation sample, 85% of adolescent smokers thought the campaign was relevant to them. 53% indicated that the campaign had led some teenagers to at least try to quit and 85% thought it made smoking seem less cool and desirable. Among students who were established smokers the campaign encouraged quitting, with 27% cutting down the number of cigarettes they smoked and 26% having thought about quitting.	19
Hersey, 2003 [22]	USA; 6875 youths 12 to 24 years old	Identifying the pathways through which state-funded counter industry media campaigns influence beliefs and attitudes regarding tobacco industry practices and smoking status	Mass media campaigns via radio, TV and telephone message	Youth living in states with aggressive counter industry media campaigns had more negative beliefs about tobacco industry practices, which led to negative attitudes toward the industry and less progression along a continuum of smoking intentions and behavior.	19
Tessier,1989 [23]	14 European countries; 2742 students	Identifying the smoking habits and attitudes of medical students towards smoking and antismoking campaigns in fourteen European countries	Advertising via TV and radio, restricting smoking in public places, training by health professionals, tobacco price increase, prohibiting selling tobacco to children	60% of daily smokers and almost all others, thought that they would no longer be smoking in five years time. Knowledge of smoker improved but there remained many lacunae in the final year *e.g.* less than 3.0% were aware that smoking was a cause of coronary artery disease. Attitudes were greatly influenced by smoking; ex-smokers were similar to non-smokers; and occasional smokers were intermediate between these and daily smokers. Only 25% accepted a preventive and educative role in advising patients who had smoking-related diseases.	16

(Table 1) contd.....

Vallone,2011 [24]	USA; 4067 adult smokers	Examining the relation between confirmed awareness of a national, branded, mass media smoking cessation campaign and cessation outcomes	Television training and telephone calls lasted for a year, during which anti-smoking messages and advertisements were presented to the target group.	Respondents who demonstrated confirmed awareness of the campaign were significantly more likely to increase their level of agreement on a cessation related cognitions index from baseline to follow-up (odds ratio [OR]=1.6; P=.046). Individuals with confirmed campaign awareness had a 24% greater chance than those who were not aware of the campaign for making a quit attempt between baseline and follow-up (OR=1.24;P=.048).	22
Aarø, 1983 [25]	Norway; 229500 students aged 12-15	Examining the effect of anti-smoking campaigns	An educational package that consisted of three elements:(1) A folder to the pupils describing the immediate effects of smoking. (2) A folder to the parents informing them.(3) A guide to the teachers giving them brief instructions on how to engage the pupils actively in the campaign.	In three of four experimental groups, the reported short-term reduction of cigarettes smoked was statistically significant. If the pupils, and their parents were actively involved, the reported reduction of cigarettes smoked was 21 % compared to only 6% in a group with passive pupils and no involvement of the parents. In a second field experiment (1979-80), a long-term reduction was shown. During the first six months there was a marked decrease in the prevalence of smokers, and compared with a control group, the effect still remained after one year.	22
Langley, 2012 [26]	England and Wales; 500 smokers	Evaluating the effect of tobacco control media campaigns and pharmaceutical company-funded advertising for nicotine replacement therapy (NRT) on smoking cessation activity	Exposure to anti-tobacco mass media advertising and smoking cessation medication advertising.	A 1% increase in tobacco control television ratings (TVRs), was associated with a statistically significant 0.085% increase in calls to the stop smoking helpline in the same month(P = 0.007), but no statistically significant effect in subsequent months. Tobacco control TVRs were not associated with NRT sales or prescribed NRT. NRT advertising TVRs had a significant effect on NRT sales which became non-significant in the seasonally adjusted model, and there was no significant effect on prescribing or calls for NRT.	20
Korhonen,1999 [27]	Finland; 1765 Adult daily smokers	Evaluating Quit and Win campaigns repeated in North Karelia and the rest of Finland	Television series and a contests were performed. These events were nationally published through newspapers and printed material. The main components of the Quit and Win contest rules were: registration no later than the quit day, a contest period of two weeks in the years 1985–89 (four weeks in all contests since 1989), a draw of winners after the contest period, and an abstinence test for potential winners.	North Karelia's participation rates were significantly higher in each campaign compared with the rest of Finland. The abstinence rates in North Karelia were also higher, the difference being significant in 1986 and 1994($p<0.05$). In the target population in 1996 over 75% of smokers in North Karelia, compared with 40% of smokers surveyed elsewhere, reported awareness of the campaign ($p<0.001$). Approximately 9% of the smokers in North Karelia and 6% elsewhere intended to participate (p = NS). Over 2% in North Karelia, compared with less than 1% elsewhere, tried to quit($p<0.001$). Among the targeted group,0.3% of North Karelian smokers were complete abstainers throughout the 12 months of follow up, compared with an average of 0.1% in other areas ($p<0.001$).	20

(Table 1) contd.....

Jenkins, 1997 [28]	San Francisco, USA;1200Vietnamese men in San Francisco	This study evaluated an anti-tobacco campaign targeting Vietnamese men	Intervention included Vietnamese-language media, health education materials, and activities targeting physicians, youth, and businesses	At posttest, the odds of being a smoker were significantly lower (odds ratio [OR] = 0.82, 95% confidence interval [CI] = 0.68, 0.99), and the odds of being a quitter were significantly higher (OR = 1.65, 95% CI = 1.27, 2.15), in San Francisco than in a comparison community.	21
Davis,1999 2007 [29]	USA; 35,000; 12- to 17-year-olds	Effects of anti-smoking media campaigns on perceived peer smoking prevalence	Television advertisements and exposure to the truth campaign and the "Think. Don't Smoke" (TDS) campaign, which provided messages and information about the harms of smoking to the target group.	Findings indicated that exposure to the truth campaign was negatively and significantly associated with perceived smoking prevalence, whereas the "Think. Don't Smoke" (TDS) campaign was not associated with perceived smoking prevalence. These findings were consistent across several different measures of exposure to the campaigns.	22
Pechmann, 2000 [30]	Five US states, and Canada; 1128 seventh grade(age 12–13 years) and 10th grade (age15–16 years) students	Assisting in planning anti smoking advertising that targeted youth	Television advertisements, school program, educational reminders over the phone, anti-smoking messages, that incited youths to be active against the tobacco industry, and anti-smoking campaigns from 1985 to 1997.	The anti-smoking advertising campaign initiated by Vermont researchers was found to be the most cost effective, and significantly reduced adolescent smoking prevalence at a low per capita cost. Next in order of cost effectiveness were California, Massachusetts, and Florida because behavioral outcomes were inconsistent across time and/or grades. California was ranked higher than the other two because it spent less per capita. Minnesota and Canada were ineffective at reducing adolescent smoking prevalence.	22
Farrelly2005 [31]	USA; 50000 students	Studied the impact of the campaign on national smoking rates among US youths	TV, radio, newspapers, billboards and numerous educational sessions	Findings indicated that the campaign accounted for a significant portion of the recent decline in youth smoking prevalence. Researchers found that smoking prevalence among all students declined from 25.3% to 18.0% between 1999 and 2002 and the campaign accounted for approximately 22% of this decline.	23
Richardson, 2014 [32]	England; 1,227,189 smokers	Investigated the effects of different types of televised mass media campaign content on calls to the English NHS Stop Smoking helpline	Televised anti-smoking mass media. Film recordings of individual advertisements and full recordings were available for 51% of the individual advertisements and their variants, still images and monthly exposure measures were available for all advertisements.	There was non-linear associations between exposure to positive and negative emotive campaigns and quit line calls. The rate of calls increased more than 50% as exposure to positive campaigns increased from0 to 400Gross Ratings (rate ratio: 1.58, 95% CI: 1.25–2.01). An increase in calls in response to negative emotive campaigns was only apparent after monthly exposure exceeded 400 GRPs.	23
Sadeghi 2020 [33]	Sirjan, Iran; 280 male and female youth	Investigated the effect of the Hookah is the Enemy of Health Campaign (HEHC) based on the protection motivation theory to prevent hookah smoking among the youth	Training through interpersonal, group, organizational and community channels and mass media. Media and educational material including printed material in the health centers, educational books, manuals, pamphlets, brochures and websites of the Ministry of Health were reviewed and educational material including messages, educational teasers, brochures, posters, pamphlets and banners, were made and distributed about hookah.	There was a significant change in the mean scores of knowledge and perceived susceptibility, perceived severity, response efficiency, self-efficacy, rewards, fear and protection motivation after the HEHC ($p < 0.05$), but there was no significant difference in perceived cost ($p > 0.05$). Also, the prevalence of hookah smoking among the target group for those who had ever consumed, decreased from 8.9 to 4% and for those who used it occasionally decreased from 35 to 19.4%.	23

The literature review conducted in this study showed that the largest national campaign was in England [32], and the USA had led the second-largest campaigns [18, 28, 29]. The training ground for these campaigns should be provided by health education specialists. In the "Truth" Campaign, a sample of approximately 50000 students of grades 8, 10, and 12 were surveyed each spring from 1997 till 2002. This campaign was associated with a substantial decline in the prevalence of youth smoking [31].

The four primary communication channels used in campaigns include interpersonal channels (face to face communication), group (small group training), organizational, community-based, and mass media [36]. Campaigns frequently competed with factors such as pervasive product marketing, powerful social norms, and behaviors [37]. In most reviewed studies, mass media such as television advertisements were used [26, 29]. Mass media campaigns we widely used to expose a large number of people to messages through routine media, such as television, radio, and newspapers [37]. But in today's era of technology and information, modern media are very functional through the internet, smartphones, software, and social networks such as WhatsApp, Instagram, Telegram, and Facebook. It is easy to send messages to many recipients quickly and at a low cost. However, a campaign can combine all of these channels and transmit messages in huge volumes. For this reason, health care workers need to acquire the necessary skills for using these media for transferring health messages [38].

One of the requirements for any educational intervention, especially health campaigns, is to design messages tailored to the target group and in accordance with the characteristics of the target group. Compliance with these recommendations may increase the likelihood of consumer comprehension [39]. Some researchers think that people can be unconsciously persuaded by advertisements, without awareness or comprehension [40]. In Smith *et al.* study, special attention had been paid to provide the right material, and the results of this study indicated that the campaign was very successful [20].

However, some tobacco prevention campaigns have failed because of inadequate length, funding, or other factors. One of them was the Farrelly *et al.* campaign, which was excluded from this review because its PRISMA score was low [41]. Anti-smoking campaigns face an array of challenges during implementations [30]. Therefore, proper planning and attention to wards all the factors are needed for the success of these campaigns.

CONCLUSION

Anti-smoking campaigns are important investments in comprehensive tobacco control programs that try to educate people about the harms of smoking, change smoking attitudes and beliefs, increase quitting intentions and quit attempts, and promote quitting. These campaigns should target big at-risk populations and provide consistent exposure over time, with a preference for delivering messages about the adverse health effects of smoking.

LIST OF ABBREVIATIONS

NCD = Non-communicable Diseases

PRISMA = Preferred Reporting Items for Systematic Reviews and Meta-Analyses

AUTHORS' CONTRIBUTIONS

Study concept and design were given by RS and NK. Acquisition of data, analysis and interpretation of data, and drafting of the manuscript were done by MM and RS; critical revision of the manuscript and statistical analysis were done by NK and MM.

CONSENT FOR PUBLICATION

Not applicable.

STANDARDS OF REPORTING

PRISMA guidelines and methodology were followed.

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CONFLICT OF INTEREST

The authors declare no conflict of interest, financial or otherwise.

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