Original Article

Role of Social Media Marketing in Cigarette Smoking Cessation- A Systematic Review

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Abstract

Background : As digital media connects global populations in unparalleled ways, social media platforms like WhatsApp, Facebook, Twitter, and Instagram are emerging as potent tools for health promotion. With India witnessing an alarming rise in tobacco consumption, the reach and accessibility of social media offer novel avenues to promote smoking cessation. This systematic review examines the role of social media marketing in cigarette smoking cessation, mapping its evolution, challenges, and potential as an intervention tool.

Methods : Following the PRISMA guidelines, a search was conducted on databases including PubMed, Trip-database, and Google Scholar from January 2001 to January 2021. The methodological quality of selected studies was evaluated using the Jonna Briggs institution critical appraisal checklist -2020 and Grading of Recommendations, Assessment, Development and Evaluations (GRADE) system.

Results : Out of 1043 identified articles, 10 met the inclusion criteria. Findings suggested platforms like WhatsApp and WeChat offer unique advantages for smoking cessation. Facebook, given its global popularity, has emerged as a potent tool for behavioral health interventions. Moreover, there's evidence of increased engagement and success rate of cessation campaigns when delivered via social media as opposed to traditional methods. While promising, the use of social media in health interventions isn't devoid of challenges. The digital divide, privacy concerns, misinformation, and quality of interaction remain barriers to harnessing the full potential of such platforms.

Conclusion : Social media presents a powerful adjunct tool for traditional smoking cessation programs. Its global reach and accessibility offer unique advantages, although challenges remain. With the right strategies, social media can play a pivotal role in global health campaigns against tobacco consumption.

Key words : Social media, smoking, cessation, marketing

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INTRODUCTION

Any form of media that uses electronic devices for distribution is said to be digital media and presently it facilitates connecting people in a way that were never possible before. Digital media uses both online and offline platforms to deliver information. Digital media marketing refers to information or advertisement delivered through digital channels such as search engines, email, websites, virtual reality, social media and mobile apps (1). Marketing strategies using interactive social media which is a part of digital media had rapid evolution since 21st century. The India digital statistic January 2021 reports currently there were 62.4 crores internet users, and 44.8 crores of the Indian population of the country (32.3% of the population) are social media users (2). Social media is found to be a promising platform to reach young adults, adolescence and elderly people also and according to the reports 2/3rd of the social media users in India are between 12-29years of age. Nowadays social media platforms such as, WhatsApp, Facebook, Twitter, Instagram, WeChat, YouTube Linked In, etc., have been used for promoting health and supporting the efforts of public health. There are numerous benefits of using social media in healthcare. It can be utilised to successfully engage with the public, improve the overall patient experience, and, most importantly, increase access to care. There will be some problems along with the benefits.

As the technology continues to explore and expand, Telehealth & mHealth was introduced in 2001 where Telehealth refers to all instances of healthcare delivered using modern technology, whereas mHealth refers to the concept of self-care consumer technologies in mobile phones that allow consumers to collect and evaluate their own health data without the assistance or interpretation of a doctor (3). Practo, DocsApp, Lybrate, Medlife, MediBuddy are popular and currently operating App services used in India with over a million downloads and these Doctors consultation related services are done either through online /offline mode. The use of social media is rapidly changing; different age groups and segments of the population have preferences for various social media platforms, for example, significantly more than older people, youngsters are more likely to use Instagram, YouTube, and Twitter, and it is difficult to predict how the most widely used platform of today will change in the future. Considering this, scientists ought to be careful with regards to leading investigations that are translatable to other different platforms and assist with enlightening fundamental standards of tobacco treatment intercession viability via social media. Social media have been utilized for wellbeing advancement and wellbeing instruction and for conveying a wellbeing treatment by offering social support or influence to promote smoking cessation and restraint.

As, Social media technologies have tremendous advantages, and their pervasiveness opens up new avenues for providing geographically distant users with cost-effective, personalised health content, as well as easily available and social network-based support (4). Social media users might potentially increase the number of collaborations and interactions, and as a result, they are provided with more accessible, shared, and data-fitted information. As individuals develop and share medical information on social media, more health information becomes available. The ability of social media to give crucial peer, social, and emotional support for the general population is an important aspect of using it for health communication. The medical field is increasingly interested in using social media for delivering health intervention through social media platforms. About 53 crores people use WhatsApp, 44.8 crores people use Facebook, 21crores people use Instagram and 1.5 crores people use Twitter. These group activities were also encouraged in which all members can simultaneously see and reply to the post (5).

Smoking or using Tobacco products are significant general problem and they are absolutely most preventable demise on the earth. In India consumption of tobacco is a huge public health issue that affects the smoker and also the bystander (passive smoker), tobacco kills more than 1 million people each year (6). Thus, there is a need for a combination of strategies which should aim to avoid initiation of tobacco use by the non-users and cessation of tobacco use among current users. Smoking prompts infection and incapacity and damages pretty much every organ of the body. World Health Organisation (WHO) and every national and international body

are finding various way to diminish the usage of tobacco, also educate and create awareness towards usage of tobacco, smoking and its harmful impact.

One of the most significant steps people may take to enhance their health is to quit smoking. This is true regardless of their age or length of smoking. It benefits people who have already been diagnosed with coronary heart disease or COPD by improving their health status and quality of life, as well as lowering their risk of premature death, adverse health effects such as poor reproductive health outcomes, cardiovascular diseases, chronic obstructive pulmonary disease (COPD), and cancer. benefits the health of pregnant women and their foetus and babies decrease the financial burden that smoking places on persons who smoke, healthcare institutions, and society.

To reduce the impact of tobacco usage various smoking cessation methods have been implemented, though smoking cessation campaigns through the media can play a major role in saving the smokers/ passive smokers from tobacco-related mortality and morbidity in the short run. As social media provides raising awareness of issues or intervention, the World Health Organisation's MPOWER measures include "offer help to quit, that there may be a misalignment between the needs of young people and the cessation method available to them. Most don't get to up close and personal or phone discontinuance benefits thus might be passing up the help they need to stop effectively. Quitting smoking may provide a distinct set of challenges for young people than for older adults. For example, they may be more concerned with how smoking affects their social demeanour than they are about their long-term health issues. As a result, more medicalized cessation options, such as consulting a healthcare professional or attempting nicotine replacement therapy (NRT), may be less significant and engaging. These typical cessation treatments may also be out of date and invisible to young people. As a result, it is critical to comprehend the role of more modernised communication channels, such as social media, in smoking cessation support. Web-based mobile phone intervention holds a promising encouragement in smoking cessation in young adults (7). Despite the availability of medications and counselling services, quit attempts usually have a relapse or smoking slips, the interactive text messages through mobile-phone or application-based interventions are potentially effective in supporting recent quitters to quit and also to prevent the relapse in smokers (8).

Social media is imbued in day-to-day existence, with high use and clear simplicity of commitment makes it as an appealing device for behavioural health interventions. In terms of target behaviour, social networking platforms utilised, and intervention characteristics, approaches have varied greatly. Social media intervention could build on the success of previous web-based smoking cessation campaigns. The expansion and penetration of online social networks into mainstream consciousness has been astonishing. Few evidence also suggests relapse occur or spread through family members, neighbours, spouse, companions. So, it is as important to educated them also, this can be achieved only when the awareness is given in a common social platform. This is undeniable and also less considered. Because of the advantages that digitally transmitted smoking cessation programmes offer over traditional interventions, they are expected to play an increasingly prominent role in the future. This new social contract has begun to allow us to observe individuals' psychological states and social milieus, frequently in real-time and across time. As a result, the purpose of this systematic review was to determine the effectiveness of social media marketing as an intervention in smoking cessation.

MATERIALS AND METHODS

The systematic review was done as per the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analysis) The protocol for systematic review was registered in PROSPERO (International prospective register of Systematic review). Register ID: CRD42021249896.

Eligibility criteria

The PIO analysis of the articles searched was done as shown below:

PIO Analysis:

Population: current smokers, former smokers.

Intervention: social media marketing

Outcome: smoking cessation rate/ smoking cessation percentage/ greater abstinence, reduction in relapse, increase in quit attempts.

Inclusion criteria:

1. Studies which included participant recruitment from social media.

2. Studies which included sample population age who were above 18years.

3. Studies which had evaluation and intervention through social media.

4. All the types of studies were included.

5. Studies written in the English language were included.

Exclusion criteria:

1. Publications with no abstract and those which are widely out of the scope of the study were eliminated.

Search strategy:

The literature search was performed in PubMed, Trip-database and Google Scholar host databases, between January 2001 to January 2021. The keywords used in the search were digital/social media, marketing, tobacco cessation, smoking cessation. The search was generated by combining the following term digital or social media, marketing, smoking cessation or tobacco cessation. The MeSH terms used in PubMed were social media and smoking cessation. To ensure additional relevant references a hand search article was conducted. but there were no relevant articles found. (Table 1)

When the abstracts of those articles met all of the inclusion criteria, full-text reading was performed. Full text articles are requested when a study meets the qualifying criteria but the information supplied in the abstract is insufficient. A literature search was also conducted using the references from the selected article.

Data extraction

The data extraction for these ten articles was done in the order of Author name and year of publication, study design, Participant age group, intervention (which detailed about no. of groups including the control group, the models used and social media platform used) outcome (which gives information on follow-up period and results) and the inference (Table 2)

Table 1- Search strategy table for the systematic review

Database	Search pattern
PUBMED	(((digital) OR (social media)) AND (marketing)) AND (smoking cessation)) AND (tobacco cessation)
GOOGLE SCHOLAR	Digital/social media marketing smoking cessation
	(Digital social media and marketing in smoking cessation smoking OR cessation "social media marketing")
TRIPDATABASE	Digital/social media marketing smoking cessation

Table 2- Data Extraction table

Author / year	Study design	Participant age	Intervention	Outcome	Inference
Kim J.S. et al (4)	Interventional study	25-50years	Recruited 16 regular smokers who were motivated in quitting smoking at screening. Then promoted message exposure as well as engagement and social support systems throughout the intervention. For message exposure, posted pre-validated, anti-smoking messages (such as national anti-smoking campaigns) on smoking reduction and cessation Facebook group. For engagement and social support systems, and delivers a high degree of engagement and social support systems during the second and third week of the intervention and a low degree of engagement and social support systems during the first and fourth week.	The outcome was smoking reduction in the past 7 days measured at baseline and at the two-week follow-up. Compared with the baseline, participants reported smoking an average of 60.56 fewer cigarettes per week at the follow-up, and 4 participants out of 16 reported 7-day point prevalence smoking abstinence at the follow-up.	This study is Facebook mediated intervention research and it supports positive effects of Facebook mediated communicationfor smoking reduction and cessation.
PechmannC et al (5)	Randomized controlled trial	18-59 years	Tweet2Quit consists of automated tweets to encourage discussion about quitting smoking sent daily and individualized automated feedback text messages sent to participants' phones daily for 100 days. Combined with usual care consisting of nicotine patches, referral to smoke free.gov cessation website, and instructions to set a quit date within 7 days. Compared to usual care only control condition.	Sustained abstinence was greater among Tweet2Quit participants compared to control participants at 7 days (41.25% vs. 37.50%), 30 days (57.50% vs. 38.75%), and 60 days (55.00% vs. 41.25%). Among study completers at 60 days follow-up, Tweet2Quit showed greater sustained abstinence (40.0%, 26/65) compared to the control group (20.0%, 14/70; p=0.017). Greater tweet volume was associated with sustained abstinence.	Social network intervention "Tweet to Quit" doubled the odds of self reported sustained smoking abstinence to 60 days follow-up, when added to the usual care of nicotine patches and a quit-smoking website.
Bakersville B.N et al (7)	Quasi-experimental controlled trial	19-29years	The intervention was based on two groups. 1.Break-it-off 2. Smokers' helpline (SHL) Break-it-Off campaign which encourages young adults to end their bad relationship with tobacco.	Break-it-Off users had higher 7-day and 30-day quit rates compared to Smoker's Help line users. At 3-months, Break-It-Off participants were more likely than Smoker's helpline participants to have quit smoking for 30 days and Break-it-Off participants were more likely than SHL participants to have made a quit Attempt	Digital/SM platform can complement the traditional SHL cessation service for young adult smokers seeking help to quit.

Cheung. D.T.Y et al (8)	Randomized control trial	18 years and above	Participants who had completed 8 week of treatment and reported abstinence for at least 7 days were recruited through advertisement in two online social groups (Group A WhatsApp and Group B Facebook) received smoking cessation counselling and reminders "treatment for the recent quitter" whereas the control group receives only the self-help booklet.	Lower relapse in the WhatsApp group compared to control group at two months (17% vs 42.6%) and 6 months (52.5% vs 61.1%). No differences in relapse in the Facebook group compared to control at 2 months (30% vs 42.6%) and 6 months (52.2% vs 61.1%) Biochemical verification Biochemically verified abstinence did not differ between groups.	The study developed and provided the first preliminary evidence that the group discussion and reminders via WhatsApp social group were effective to reduce smoking relapse.
Cobb.K.N. et al (9)	Randomized control trial	18 years and above	Fractional factorial design to evaluate the impact of (t time, Z contacts, and β contagion) - The trail conducted within Facebook (study seed) through advertisement, all participants were registered users of Facebook. Randomized seed users to 1 of the 12 cells using an adaptive "biased – coin" strategy. "Based on US Public Health Service **5 As model**. Users interact with Dr. Youkwitz, a character who supports quitting and setting a quit date. App is also available for non-smoker supporters. Trial compared 3 app components: duration of use, content sharing and use by non-smoking supporters.	Diffusion of application through the Facebook was outcome. Combined strategies for sharing and increasing duration of use contributed to highest level of diffusion. Involving non-smoker supporters did not affect diffusion. Non – smoking related outcomes reported.	The study to show the intervention diffusion is a function specific application element. Findings confirmed that the viral spread is indeed to manipulate within an online application for health behaviour change.
Pechmann. C et al (10)	Interventional study	18-59years	Tweet2Quit which included closed groups on Twitter with 20 person quit-smoking group in 100days and were sent daily automated messages to encourage group discussion about evidence based smoking cessation topics, or to provide individualized feedback to participants about their interaction in the group. Automated Twitter intervention combined with evidence-based practices. This purely web-based trial examined two online quit-smoking groups with 20 members each.	In addition, abstinence was assessed at 7days, 30days, and 60days post quit date. On an average each member sent 72 tweet during the 100 day period. More frequent tweeting was not related to abstinence. Tweeting about smoking related topics such as setting a quit date or using nicotine patches, overcoming barriers to quitting smoking, and expressing confidence about quitting were related to abstinence	We have developed hybrid social media based smoking cessation intervention called tweet to quit, that combines traditional real time peer-peer social support with daily auto-messages and auto-feedback. Engagement was high and the auto messages helped to ensure that the peer-peer discussion were consistent for smoking cessation.
Ramo E.D. et al (11)	Randomized controlled trial	18-25 years	TSP (Tobacco Status Project) provided private Facebook groups tailored to stage of change to quit smoking, daily contacts, weekly live counselling sessions and for those ready to quit, six Cognitive Behavioural therapy counselling sessions. Some TSP groups were randomly assigned to receive a monetary incentive for engagement. Control provided referral to	Primary outcome: Biochemically-[verified] 7-day abstinence over 12-months. Secondary outcomes: Post-treatment (3 month) abstinence; Reported abstinence, quit attempt, reduction in smoking, readiness to quit smoking over 12 months. Verified 7-day abstinence was not significantly different for intervention	The social media intervention had significant effect on abstinence while the intervention was active. Once removed, the treatment effects were not sustained in follow-up assessments out to 1-year.

					compared with control over 1 year: month 3 (8.3% vs. 3.2%), 6 (6.2% vs. 6.0%), and 12 (5.9% vs. 10.0%); Retention=71%. There was an effect at 3-months. But there were no effects for 12 months treatment reported abstinence, reduction in smoking by 50% or more, likelihood of having made a quit attempt or stage of change over time. Participants in TSP engaged more and rated the intervention more favorably than those in the control condition	
Chen J. et al (12)	Randomized controlled trial	25-44 years	All data were collected via WeChat. The intervention group received access to the full-version SCAMPI program a Chinese-language smoking cessation program based on the Behavior Change Wheel framework and relevant cessation guidelines. Standardized tests for users to assess their levels of nicotine dependence and lung health, as well as a social platform to encourage social support between users. The control group had access to a static WeChat page of contacts for standard smoking cessation care.	The primary outcome was 30-day biochemically verified smoking abstinence at 6 weeks after randomization, with missing data treated as not quitting. The Secondary outcomes were other smoking status measures, reduction of cigarette consumption, study feasibility (recruitment and retention rate), and acceptability of and satisfaction with program; At 6 weeks complete self-reported data on their daily smoking status via WeChat. Biochemically verified smoking abstinence at 6 weeks was determined for 10 of 40 (25%) intervention participants and 2 of 40 (5%) control participants. In the intervention group, the calculator function, motivational messages, and health tests were underused (less than once per week per users).	The smoking cessation program underpinned by theoretical model and empirical evidence achieved significantly higher 30 day both (self reported and biochemically verified) Smoking abstinence at the 6-week follow-up as well as 7 day self-reported smoking abstinence (at the 4-week and 6-week follow ups) than those randomized to the control program.
Haines-Saah J.R et al (13)	Qualitative study	19-24years	Picture Me Smoke free" is a Facebook photography group. Participants are encouraged to post pictures with captions related to quitting smoking. Moderator posts photo-challenges, topics or contests.	Photo group appeared feasible and provided opportunity for young adults to access peer support for quitting smoking. Participants indicated preference for mixed gender groups. Challenges with attracting and retaining participants. More interactive features are necessary in future interventions	Tobacco intervention for youth and young adult should be embedded within the existing social networking platform. They access most frequently rather than stand alone online prevention or intervention source. "Picture Me Smoke free" suggests that for young adult who smoke an online context to provide awareness of smoking

					behaviour that serves as motivation for their beginning to contemplate quitting.[13]
Ramo E. D. et al (14)	Interventional study	18-25years	The intervention was based on US Public Health Service clinical practice guidelines and the trans theoretical model. Participants who used Facebook were recruited, and received the intervention were randomized to one of three monetary incentive groups tied to engagement (secret Facebook group-stages of quitting, pre-contemplation, contemplation, preparation). Assessments were completed at baseline 3, 6, 12 months follow-up. Analysis examined retention, smoking outcomes over 12 months, engagement, satisfaction with intervention.	At 12 months, Participants prepared to quit increased from 10(13%) to 36 (46%). 28 (35%) cigarette consumption by the participant were50% or greater; 52 (66%) made a 24-hour quit attempt during the study., then biochemically, 5%verified abstinence at 3-months, 8% at 6-months, and 8% at 12-months, concluded as self-reported7-day point prevalence of 9% at 3-months, 18% at 6-months, and 13% at 12-moths.	The study suggests that Facebook quit smoking intervention is attractive and feasible to deliver.

RESULTS

Search results

The search generated 1043 articles based on the title from 3 different database: PUBMED, TRIPDATABASE, and GOOGLE SCHOLAR. 143 articles were produced by PUBMED, 198 articles were produced by TRIPDATABASE, 702 articles were produced by Google Scholar. Among, due to duplication 405 articles were removed, after reading the abstract 76 articles were removed and 66 articles removed after full-text reading. At last, based on the inclusion and exclusion criteria, only 10 of the articles (4, 5, 7, 8, 9, 10, 11, 12, 13, 14) were selected to review (Figure- 1). The inter-examiner bias was eliminated. The first two authors (NK & AS) analysed the studies. The discrepancies between the first two authors were resolved by the consensus from the third author (MK). Good inter reliability (kappa value = 0.8) was obtained.

Qualitative assessment of the included studies

The methodological quality of the articles was assessed using JBI scale -Jonna Briggs institution critical appraisal checklist -2020 (15) which had independent proformas specific for Randomized Control Trial, Quasi-Experimental Trial, Qualitative studies. The interventional were also assessed along with the Randomized Control Trials. The Randomized Control Trial/ interventional studies, Quasi- Experimental studies and Qualitative studies were assessed against 13,9,10 questions in their respective scales. The response to their questions included Yes/ No/ Unclear/ Not applicable. (Table- 3a, 3b, 3c)

This systematic review has reported two high quality evidence, two moderate, four low and one very low quality of evidence study based on the "Risk of Bias, Inconsistency, Indirectness, Imprecision" criteria. The GRADE system (GRADE- Grading of Recommendations, Assessment, Development and Evaluations) rates the quality or certainty of the evidence, summary of findings table and presents the results (together with the GRADE rating) for the most important outcomes in the review (Table-4). The quality of evidence are degraded by "very serious issue (-2 point), serious issue (-1point) and not a serious issue (no points are reduced) after the assessment the included studies are reported as "High ⊕ ⊕ ⊕ ⊕, Moderate ⊕ ⊕ ⊕ ○, low ⊕ ⊕ ○ ○ and very low ⊕ ○ ○ ○ evidences. Higher the evidences, better the quality of study.

To determine risk of bias cross these studies Review Manager Software 5.4 was used and the risk of bias was categorized as low risk, unclear risk and high risk.

Table- 3a Randomized control trial - Jonna briggs institute (15) - JBI critical appraisal checklist-2020

	Cheung et al 2015	Cobb et al 2016	Pechmann et al 2017	Ramo et al 2018	Chen et al 2020	Pechmann et al 2015	Ramo et al 2015	Kim et al 2017
Was true randomization used for assignment of participants to treatment groups?	Yes	Yes	Yes	Yes	Yes	No	No	Yes
Was allocation to treatment groups concealed?	Yes	Yes	Yes	Yes	Yes	unclear	Yes	Unclear
Were treatment groups similar at the baseline?	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes
Were participants blind to treatment assignment?	Yes	Not applicable	No	Yes	No	No	Yes	No
Were those delivering treatment blind to treatment assignment?	Yes	Not applicable	No	Yes	No	Unclear	Yes	No
Were outcomes assessors blind to treatment assignment?	Yes	No	Yes	Yes	Unclear	Yes	Unclear	No
Were treatment groups treated identically other than the intervention of interest?	Yes	Not Applicable	Yes	Yes	Yes	Not applicable	Yes	yes
Was follow up complete and if not, were differences between groups in terms of their follow up adequately described and analysed?	Yes	No	Yes	Yes	Yes	Yes	Yes	yes
Were participants analysed in the groups to which they were randomized?	Yes	Not applicable	Yes	Yes	Yes	Yes	Yes	Unclear
Were outcomes measured in the same way for treatment groups?	Yes	Not applicable	Yes	Yes	Yes	Yes	Yes	Yes
Were outcomes measured in a reliable way?	Yes	Yes	Unclear	Yes	Yes	Unclear	Yes	Unclear
Was appropriate statistical analysis used?	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes
Was the trial design appropriate for the topic and any deviations from the standard RCT design accounted for in the conduct and analysis of the trial?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table- 3b Quasi experimental trial study – Jonna Briggs Institute (15) - JBI critical appraisal checklist -2020.

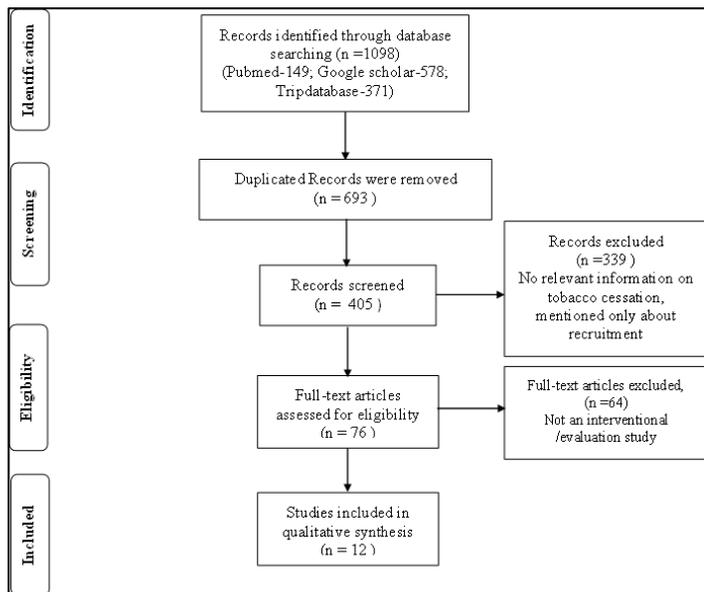|		Yes	No	Unclear	Not applicable
1.	Is it clear in the study what is the 'cause' and what is the 'effect' (i.e. there is no confusion about which variable comes first)?	✓	☐	☐	☐
2.	Were the participants included in any comparisons similar?	✓	☐	☐	☐
3.	Were the participants included in any comparisons receiving similar treatment/care, other than the exposure or intervention of interest?	✓	☐	☐	☐
4.	Was there a control group?	☐	✓	☐	☐
5.	Were there multiple measurements of the outcome both pre and post the intervention/exposure?	☐	☐	✓	☐
6.	Was follow up complete and if not, were differences between groups in terms of their follow up adequately described and analyzed?	✓	☐	☐	☐
7.	Were the outcomes of participants included in any comparisons measured in the same way?	✓	☐	☐	☐
8.	Were outcomes measured in a reliable way?	✓	☐	☐	☐
9.	Was appropriate statistical analysis used?	☐	✓	☐	☐

Table – 3c Qualitative study- Jonna Briggs Institute (9)- JBI critical appraisal checklist-2020

		Yes	No	Unclear	Not applicable
1.	Is there congruity between the stated philosophical perspective and the research methodology?	✓	☐	☐	☐
2.	Is there congruity between the research methodology and the research question or objectives?	✓	☐	☐	☐
3.	Is there congruity between the research methodology and the methods used to collect data?	✓	☐	☐	☐
4.	Is there congruity between the research methodology and the representation and analysis of data?	✓	☐	☐	☐
5.	Is there congruity between the research methodology and the interpretation of results?	✓	☐	☐	☐
6.	Is there a statement locating the researcher culturally or theoretically?	✓	☐	☐	☐
7.	Is the influence of the researcher on the research, and vice- versa, addressed?	✓	☐	☐	☐
8.	Are participants, and their voices, adequately represented?	✓	☐	☐	☐
9.	Is the research ethical according to current criteria or, for recent studies, and is there evidence of ethical approval by an appropriate body?	✓	☐	☐	☐
10.	Do the conclusions drawn in the research report flow from the analysis, or interpretation, of the data?	✓	☐	☐	☐

TABLE –4 Quality of evidence (Ryan R, Hill S (2016) How to GRADE the quality of the evidence, Cochrane Consumers and Communication Group) (16)

Author	Study design	Risk of bias	Inconsistency	Indirectness	Imprecision	Over all evidence
Cheung et al 2015	Randomized control trial	Not serious issue	Not serious issue	Not serious issue	Not serious issue	High ⊕⊕⊕⊕
Cobb et al 2016	Randomized control trial	Serious issue	Not serious issue	Not serious issue	serious issue	Low ⊕⊕OO
Pechmann et al 2017	Randomized control trial	Serious issue	Not a serious issue	Not a serious issue	Not a serious issue	Moderate ⊕⊕⊕O
Ramo et al 2018	Randomized control trial	Not a serious issue	Not a serious issue	Not a serious issue	Not a serious issue	High ⊕⊕⊕⊕
Chen et al 2020	Randomized control trial	serious issue	Not a serious issue	Not a serious issue	Not a serious issue	Moderate ⊕⊕⊕O
Pechmann et al 2015	Interventional study	Very Serious issue	serious issue	Not a serious issue	Not a serious issue	Low ⊕⊕OO
Ramo et al 2015	Interventional study	Very Serious issue	Not a Serious issue	Not a serious issue	Not a serious issue	Low ⊕⊕OO
Kim et al 2017	Interventional study	Very serious issue	serious issue	Not a serious issue	very a serious issue	Very Low ⊕OOO
Baskerville B.N-2016	Quasi experimental study	Very Serious issue	Not a serious issue	Not a serious issue	Not a serious issue	Low ⊕⊕OO

Figure 1: Flow chart- Role of digital media marketing in tobacco cessation

Identification
Records identified through database searching (n =1098)
(Pubmed-149; Google scholar-578; Tripdatabase-371)

Screening
Duplicated Records were removed (n =693)

Records screened (n = 405)

Records excluded (n =339)
No relevant information on tobacco cessation, mentioned only about recruitment

Eligibility
Full-text articles assessed for eligibility (n = 76)

Full-text articles excluded, (n =64)
Not an interventional /evaluation study

Included
Studies included in qualitative synthesis (n = 12)

The population included in this study were current smokers and former smokers who are above 18 years of age. The study included in this systematic review reported smoking-related outcomes like quit attempt, abstinence and relapse which were largely self-reported by the participants. Three of the studies (Cheung YTD et al-2015, Ramo DE et al 2018, Chen et al-2020) in this review were quantitatively assessed using the biochemical parameters. They also showed that social media platforms made participant recruitment easier and successful (8,11,12).

Social media platform used:

In 2015 Cheung YTD et al, stated that social media interventions were effective through WhatsApp when compared to Facebook and he also suggested that a longer intervention period might extend the period of relapse for smoking. Similarly, Chen J et al in 2020 conducted a study, where WeChat App was used and also found to be novel, effective, accessible and acceptable in smoking cessation among the participants (12).

Kim et al stated, that Facebook-mediated communication, engagement, social support had a positive effect on smoking cessation. Ramo DE et al and Baskerville NB et al in their study stated that Facebook-integrated smoking cessation was feasible to deliver to young adult smokers. It was found to be more attractive to deliver intervention through Facebook over the other traditional method; digital or the social media intervention's quitting success was high. Social media offered a promising opportunity to promote smoking cessation. Wherein Pechmann C et al in his study used Twitter for the smoking intervention as it connects the world more efficiently (4, 7, 11)

Based on the age and gender Haines –shah RJ et al in 2015 reported that young adults utilized intervention more than the elderly, gender-related influences for the intervention resulted in gender sensitivity rather than gender specificity due to mirrored social interaction (13). But in a study, Pechmann C et al stated that Male was significantly more likely to quit rather female (5).

DISCUSSION

Smoking cessation therapies offered digitally are expected to play a major role in the future. They are preferred over traditional interventions due to a number of advantages. Traditional print-based self-help tools for smoking cessation are far less expensive, yet they are ineffective. For bigger groups of individuals, interventions offered through digital/social media such as web pages, e-mails, and interactive voice recordings are available. Digital media appears to have considerable potential as a cost-effective self-help smoking cessation strategy (17).

Facebook is the world's most popular social media platform as it is available in more than a hundred languages. GAIN and LOSS framed messages about smoking behaviour on Facebook have commonly been used to promote cessation. Gain framework projects positive consequences of smoking cessation while Loss framework projects negative consequences (effects of smoking) of smoking. That can be effective at different stages of the smoking cessation programs and also for different age groups population (18). Further more youth are bombarded with anti-tobacco messaging and occasionally handed complimentary smokes. Such actions undermine the tobacco industry's professed responsibility to protect young people from smoking.

Smokers usually undergo one or more quit attempts during their intervention period, encouraging participants for smoking cessation through social media were prompted to make a large number of quit attempts. Social media interventions should take use of the social context to boost self-efficacy for quitting and increase cessation among individuals who are ready to quit smoking. "In the context of counselling, smoking cessation intervention through social media can also focus on improving or supporting the uptake of Nicotine Replacement Therapy (NRT) and other medication." Therefore, social media along with cessation programs will be more effective in smoking cessation (19, 20)

Social media is a new forum for sharing heartbreaking real-life experiences that help to portray their experience, emotion, and the life-limiting realities of smoking. The general population is willing to participate in a discussion about how smoking has harmed their families. People tag friends, share posts, and share their personal experiences about how their loved ones were affected. This calls into question some people's notions that social media must always be positive to compete for attention with commercial brands, and it undoubtedly gives potential to other tobacco control concerns. Sharing smoking cessation success stories on social media platforms/websites (particularly Facebook) where everyone can easily access them is encouraging because successful quitters are regarded as a valuable resource for others attempting to quit smoking as well as providing normative influence within the social network. Furthermore, abstinent smokers in the social network are positively reminded of their smoking cessation journey, which enhances their desire to remain smoke-free permanently. Furthermore, smokers who are attempting to quit smoking can gain motivation and support from reading the accounts of others who have successfully quit smoking (21).

To effectively reduce smoking prevalence in half, cessation treatments must reach millions of people in consumer-friendly ways. The convergence of strong evidence for the significance of social support in smoking cessation, the expansion and multiplication of online networks, and recent improvements in social network analytic techniques provide an opportunity for the development and dissemination of high-impact smoking therapies. The notion that online social networks offer a powerful and new method of cessation is backed by research from areas as diverse as tobacco control, social psychology, and social network science. There are two sides to everything on earth including social media interventions, the intervention through social media will only prove successful if it is done properly and effectively, when it is not abided the failure leads to a detrimental effect.

The use of social media in public health and health promotion has met with some success. There are numerous problems and complications associated with social media use that must be addressed in order to generate support structures and networks for effective health behaviour change. While it is simple to think of social media as a universal communication tool, especially for those who already use social media, the risk of using social media lies with those who are not "technologically connected" by reducing their health information access. Social media is unlikely to be a successful alternative for population segments such as the physically and intellectually challenged, the elderly, and people with inadequate text literacy. Despite the fact that social media was supposed to improve social connection, it has been discovered that persons who spend more time on social media every day felt lonely than those who checked their social media less frequently. However, rising health inequalities were also a worry due to issues with social media access, acceptability, and unmonitored quality.

 In general, smoking cessation is a slow process, with smokers making many stop attempts before successfully quitting. It is extremely likely that smokers at baseline who reported not smoking at follow-up are still trying to quit (22). People tend to select others with similar behaviour as their friends in social networks on health-related behaviours, which may explain to some extent why the change in behaviour of smoking cessation is essentially another quit attempt. It also supports the notion that smoking habits are contagious; however, the addictive nature of cigarette smoking, as well as consistent visual cues of smoking by social network members, may make it more difficult for smokers to quit and easier for a former smoker to relapse (19, 23)

Some evidence suggests that Participant involvement in social media Smoking cessation programmes can result in positive smoking cessation outcomes; participant involvement definitions and metrics vary across research and platforms. While standardising engagement across platforms may be difficult due to inherent differences in technology and user interfaces, we believe that some distinctions should be made between

passive (e.g., viewing intervention content) and active engagement (e.g., commenting, liking, sharing/ reposting). Furthermore, researchers must examine the level and quality of interaction.

On the whole, this systematic review showed that there is a high level of heterogeneity and a moderate level of bias in the studies included. The Systematic review of five randomized control trials, three interventional studies, one quasi-experimental study and one qualitative study showed social media intervention is a promising tool for smoking cessation in future.

CONCLUSION

This review analysed outcomes from ten studies on the use of social media for smoking cessation interventions. Based on the research we considered, we discovered that social media-based smoking cessation therapies were effective in enrolling smokers from all over the world to be evaluated on the same platform. Today, billions of individuals utilise social media, and this figure is growing. It would be beneficial to develop and refine new low-cost social media-based ways for smoking cessation programmes. Developing adequate analytic approaches and structuring research protocols will necessitate true collaboration across many domains and disciplines. Success could lead to therapies that can reach vast populations, supplement established therapy methods, and influence behaviour in unexpected ways. However, to achieve better results, criteria such as accomplishing cessation goals and compliance with quitting must be adequately monitored. Interventions that employ well-known social media platforms may have higher use and acceptability rates because they leverage existing social networks. These platforms should be assessed in future studies. Users of social media are frequently unaware of the dangers of sharing personal information online and communicating damaging or erroneous advice via social media.

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