

# Promoting Health Behavior in Young People in India: Learning for use of Social Media

Paridhi Gupta<sup>1</sup> (MPH), Neetu Purohit<sup>2</sup>, (PhD)

1. PHFI-Indian Institute of Public Health Gandhinagar, Gujarat, India
2. Department of Psychology, IIMR University Jaipur, Rajasthan, India

**Submitted:** 17 September 2020

**Accepted:** 21 October 2020

Int J Behav Sci. 2020; 14(3): 122-130

## Corresponding Author:

Paridhi Gupta,  
Senior Research Fellow,  
PHFI-Indian Institute of Public Health  
Gandhinagar,  
Gujarat,  
India  
E-mail: drparidhigupta@gmail.com

## Abstract

**Introduction:** In today's world, social media plays a major role in young people's lives. Social media has the potential to reach and deliver information far and wide, including information on health behavior and lifestyle which could benefit in long term. The objective of this paper was to examine the use, reach and effectiveness of social media in health promotion and behavior change of young people.

**Method:** In order to carry out this study, a review of secondary literature was done. PubMed, Cochrane Library and reference lists of relevant articles from 2012-2018 were searched to identify social media interventions. Studies included in the review had used social media interventions for health behavior change.

**Results:** Nine studies were identified as relevant to the study objective. Studies mainly used Facebook (n=6) as a social media platform to carry out behavior change interventions. Findings suggest that social media interventions are not only feasible but acceptable in the young community. The principle of engagement and peer or social support emerged as an important construct associated with behavior change.

**Conclusion:** Social media platform provides advantages like easy accessibility and acceptability. However, its mere availability and increasing use do not ensure its effectiveness. The lessons which this review gives are that while social media is an accepted platform for youth, it will not be effective as a behavior change tool if it is used just for information-sharing. Thus, behavior change theories and social support ensuring engagement are a few recommended approaches for social media interventions to facilitate behavior change.

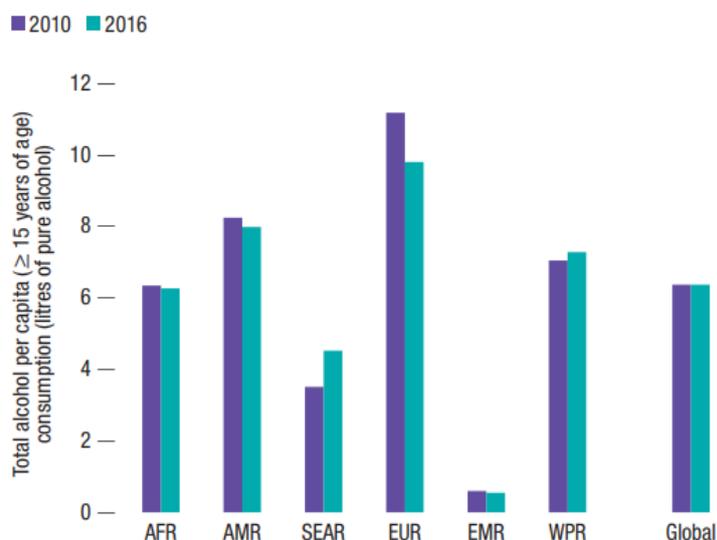
**Keywords:** Health Behavior Promotion, Internet, Intervention, Social Media, Youth

## Introduction

Adolescents, young people, and youths in the age group of 10-29 years are valuable human resources for any country as they bring societal and economic benefits through greater productivity [1],[2]. The age period spanning 10-29 years is also a period of major physical, physiological, psychological and behavioral challenges and changes. The orientation, experiences and guidance one receives during this age sets the stage for healthy and productive adulthood and determines the probability of health-related problems in later years [3].

Despite the awareness, many adolescents and young people fall prey to behavioral risk factors like tobacco and alcohol use, physical inactivity, unprotected sex, mental health, violence, injury, and others [4]. Globally, 1 in 10 adolescents aged 13 to 15 years use tobacco; 10-19 years of age group contributes to mental health conditions accounting for 16 percent of the global burden of disease [4].

Figure 1 shows worldwide alcohol consumption among 15 years and older worldwide and in the WHO South-East Asia Region (SEAR) since 2010 [4], with an increase of 2.2 liters consumption in India alone [5].



**Figure 1.** Alcohol Consumption among 15 Years and Older, WHO Health Statistics, 2018

According to a global status report, the prevalence of heavy episodic drinking in 2016 was found to be almost 51 percent in the age group of 15-19 years which is an issue of great concern for India [6].

Recent trends have shown that the use of social media has increased. Adolescents and youths have the highest rates of social media use of any age group [7]. A study in 2017 found that 56 percent of Indian users in the age group of (14-25) spend at least an hour daily on social media [8]. The use of internet/social media is often viewed as leading to a sedentary life, which reduces physical activity, productivity and physical interactions among people [9], and could be a threatening factor for young people [10, 11]. Hence, its time social media is assessed in a different light, - as a facilitator or promoter of health behaviors among young people.

There has been an increase in social media interventions in the public health field to improve health outcomes and health behaviors (for example smoking cessation, diet practices, physical activity, and body image). Behavior change interventions ought to be using appropriate theories which could bring about the desired change. A number of theories of behavior change have been postulated with varying focus on personal, behavioral and environmental factors as determinants of change. Some theories focus primarily on the individuals (e.g. Health Belief Model) [12] while other theories move away from the individual to focus either on behavior itself (e.g. Diffusion of Innovation) [13], or relationships between behavior, individuals and the social and physical environments (e.g. Behavioral theories of conditioning, Social Cognitive theories) in which they occur [14], [15]. In this context, the effort is made to review how social media has been used in public health and the manner in which the designed interventions have operationalized the theoretical concepts to ensure the reach and effectiveness of health promotion among young people.

In this context, it is important to explore how social media has been used in public health and examine their

use, reach, and effectiveness in health promotion for young people.

### Method

A review of secondary literature was carried out to identify the social media interventions for health promotion in young people.

All available literature from two electronic databases including PubMed and Cochrane Library were used to search for "use, reach and effectiveness of social media in young people's health behavior" in January 2019. Studies published in the English language from 2012 to 2018 were included in this review. The reference list of included studies was also searched to identify relevant studies. The important search terms were young people, young adults, youth, adolescents, health behavior, health communication, health promotion, combined with social media, social media platforms and interventions. Each term was entered as a keyword to search for relevant articles. These terms were then combined with "AND" and a star truncation (\*) was used where multiple endings of terms were possible.

Studies that reported adolescents, youth, and young people were selected. This study population is considered to be at significant physical, psychological, and social transformation during 15-30 years of age. This age period not only carry a risk of adopting unhealthy habits but also provides opportunities to positively influence and restore the health of the young community.

The primary outcomes were knowledge, attitude, self-efficacy, and motivation to achieve positive health behavior for improving physical and mental health via online interventions using social media either completely or in part. Interventions other than social media platforms were not included. Online surveys, mobile health applications, and other technology-based interventions were excluded. Systematic reviews, reports, case study, study protocols, working paper, and thesis/dissertation/capstone work were also excluded from this review.

### Results

A total of 64 studies were identified for abstract review. Among these, nine studies were found to be relevant for the use, reach and effectiveness of social media interventions. The remaining 52 studies did not meet the inclusion criteria (no intervention (n)- 12; reviews (n)- 7, editorial (n)- 3, conference/working/thesis paper/debate (n)- 6, reports (n)- 5, policy (n)- 1, protocol (n)- 4, surveys (n)- 14). Furthermore, three studies were excluded as they did not have social media content.

### Use of Social Media for Health Promotion

Social media is increasingly being used for health purposes. The reviewed studies were using social media platforms for providing disease-related information, encouraging physical activity, smoking cessation, diet/nutrition and also information and hand-holding on sensitive and stigmatized health topics such as sexual health and substance abuse for facilitating behavior change. Based on health issues, the below section presents a brief description of the social media interventions categorized into smoking cessation, physical activity, and sensitive and stigmatized interventions. Table 1 shows the way the nine campaigns/interventions used social media and how it affected coverage and effectiveness.

#### Social Media Intervention for Smoking Cessation

1. "What Should We Call Quitting (WSWCQ)" is a Tumblr blog, operated by a health research group, contains FDA-approved cessation aids and evidence-based cessation resources [16]. The blog generates relevant content which is based on the experiences, feelings, and challenges of young smokers who failed to quit in their initial attempt. Secondly, The WSWCQ administrators encourage users to share their personal experiences and recommendations for quitting through personal testimony (e.g. what worked for them in quitting). Jacobs et al. [16] found that users provided feedback about benefits; maintained abstinence and encouraged others to quit.
2. The Twitter-based intervention combined with a daily "auto-message" (to encourage an evidence-based cessation-related group discussion) and individual "autofeedback" (to encourage engagement on past 24-hour tweeting). Within 14 days of initiation of intervention, the participants were also provided with nicotine patches and instructions to decide a quit date [17]. Pechmann et al. [17] noticed that content in the tweets (Tweet2Quit) included participants smoking histories, barriers to quitting and social support related to abstinence.
3. In "picture me smoke free" intervention on Facebook, a visual method "Photovoice" was adapted to facilitate user-driven peer support and interaction within an online community [18]. This method was used to engage users to "critically reflect about their health behaviors" through discussion between them and researchers. This quitting information was liked by the participants as it provided the required reinforcement for cessation.

Further, freedom in posting the pictures, support from peers; and obtaining the suggestions from participants also worked towards the improvement of intervention.

4. Similarly, Facebook intervention "crush the crave" posts encouraged cessation; promoted social support; provided suggestions about managing cravings; provided health information; exhibited positive social outcomes of smoke-free life and exposed tactics of the tobacco industry [19].

#### Social Media Intervention for Physical Activity

5. An 8-week beginner running program "UniSA Run Free" based on social cognitive theory, was delivered on Facebook [20]. The creators were health professionals and fitness experts. The running sessions were posted per week; including warm-up, main activity and cool down. The participants were asked to post photos, motivational quotes, opinion polls or informative links to interact with the facilitator and others. After two months of the program, there was a significant increase in weekly moderate to vigorous physical activity (140 min/week).
6. "SHAPE-UP" a 13-week exercise program was designed for university students to create an exercise routine [21]. The website was created for users to enroll in exercise classes. Classes were scheduled in an online calendar; where participants could read the messages and register for it. After completion of the program, it was found that promotional messages and social influence increased engagement and encouraged behavior change.
7. A walking intervention was conducted to promote physical activity among female college students for 8 weeks [22]. The participants were randomized into intervention and control groups. Participants were provided with a pedometer, logbook, personalized goal of increasing steps/day from the previous week and encouraging educational posts on physical activity. The only difference in the intervention group was that the participants received social support on Facebook. Among both groups, results were statistically significant ( $P < .0004$ ) in the number of steps per week over time. Also, social support resulted in a greater increase in physical activity in the intervention group; suggesting an important component of online social media interventions.

#### Social Media Intervention for Sensitive Issues

8. "The Face Space Project" was designed to promote sexual health in young people [23]. The creators were public health researchers, experts and some organizations. The creators used fictional characters to post content (sexual health messages) and to interact with the participants on social networking sites (SNS-Twitter, Facebook, Youtube). Two young male and female characters and character narratives were developed in the workshops that had an account on SNS. At the end of the project, the videos total views were more than 5000 and interaction was

more on the Facebook page.

9. An Adelante intervention was designed to target risk factors like sexual risk and substance abuse [24]. It was developed in four phases. The first two phases were aimed to identify campaign goals, framework and study population. The third and fourth phase was based on the participant's language and social media preferences. The themes related to intervention were posted as posters, text messages, contests and videos on a social media platform and Adelante website. Campaign results showed a decrease in substance abuse and sexual risk and increase in personal youth development.

### **Reach and Effectiveness of Social Media for Health Promotion**

Reach, "the potential of exposure to health communication is an important aspect of the promotion of behavior change interventions on social media" [25]. Social media has been leveraged as a communication tool to promote health education and eHealth interventions to change health behaviors as it ensures reach to a large number of adolescents and young adults. Table 1 presents the information on the reach via different social media platforms like Face book, Twitter, and websites under different campaigns and interventions. Since the campaigns considered under the study included development trails, randomized trials, and pilot projects also, in a few of the interventions, the reach appeared to be low. The duration of social media interventions also varied from two months to 4-5 years.

As far as effectiveness is concerned, all nine interventions were found effective although in different measures. The strength of the campaign/intervention was primarily the availability of social media platform but the wise use of behavior change theories and constructs helped in enhancing the strengths and reaching the desired goals of the intervention.

The use of behavioral change theories is important in developing successful online health promotion activities, however, only a few reviewed interventions/campaigns explicitly mentioned them. Social cognitive theory and social modeling were reported by two interventions, others did not state about the theoretical foundations. However, other studies in which intervention was implemented helps in identifying many of the constructs of behavior change theories like social support, peer influence, reinforcement, feedback, and use of encouragers as important facilitators for behavior change.

### **Discussion**

The results of the review show that interventions and campaigns designed on the social media platforms can be quite effective for promoting healthy behavior among adolescents and young people. There are however certain prerequisites that could enhance the possibilities for achieving the desired expectations.

Social media is participatory, socially engaging, and reciprocal. As young people are at the developmental

stage and social media is already an accepted medium for them, its potential could be utilized to influence and promote responsible health attitudes and behavior among them.

This review found that while a few interventions consciously used theories of behavior change like social cognitive theory, social modeling, all other campaigns and interventions used the constructs of behavior change. The behaviorist principle of reinforcement involving auto messages and auto feedback to provide praises and encouragers was used for smoking and cessation behaviors. The behavior change was facilitated by promoting the preparation of quit plan, telephone-based help, the supply of nicotine patches and evidence-based information. Literature has already provided evidence that the ones who plan and prepare, get support and who reward themselves are more likely to quit undesirable behaviors (Trans-theoretical model) [26] and social media campaigns in the studies reviewed were found to be using it.

The Social Cognitive Theory including role modeling was used for behaviors involving physical activity. The campaign conveyed that resistance to physical activity can be curbed if encouragement via role models and social networks is ensured. The role of feedback for desired and achieved outcome was also reported in increasing physical activity. Worldwide, social influencers are having a large number of young followers. The young people could be primed to engage with the health-related content if shared by the social influencers. In using influencers to increase the impact causing social connection, a promoter of behavior change ensures young people would engage in the adoption of healthy behavior.

Another reason for the popularity of social media is that it provides valuable peer, social and emotional support. The last category of campaigns was behaviors related to sexual and substance abuse. This is the behavior which faces lots of stigma and taboo and people who want to correct their behavior, they too are often not able to seek services. Social media aids in health behavior change while communicating and discussing sensitive issues and complex health information with other online users [27]. The social media campaign of the reviewed studies focused on social-modeling and using fictional characters to share stories and convey messages to reduce risk behavior. Social media has an advantage over other mediums as it can ensure anonymity and therefore people don't hesitate to take their services. This is particularly true in the Indian society.

The biggest strength of social media is that it has the ability to engage its participants and it was found that this principle was effectively used. The interventions used novel ways to keep its participants engaged by providing new evidence-based information, encouraging participation by providing 'likes' and 'updates'. Literature shows that engagement involves "listen, share, create, act, respond, ask" to determine healthy change across online channels [25]. All these components were found to be widely used by all the included social media intervention studies.

**Table 1.** Use, Reach, and Effectiveness of Social Media

Purpose	Use		Reach			Effectiveness			Reported/ Inferred Behavior Change Theory
	Age Group in Years	Study Type/ Research	Medium	Coverage	Methods to Deliver Message on Social Media Platform	Duration of Intervention	Results	Strength/ Limitation/ Lessons Learnt	
Smoking cessation "What Should We Call Quitting" [16]	18-24	N/A	Blog	3315 Followers	Smoking Cessation Novel branded content, conducting proactive outreach to make smokers aware of the blog, fostering user engagement and support by liking, replying or commenting a post/ideas and asking a question to the WSWCQ administrator about quitting	3+y	5 new followers each day, a slow but steady growth of an online community, feedback from users, social encouragement	Successful to engage users but challenges related to download, export & saving of data for future analysis along with other technical and measurement challenges	Engagement; Encouragement
					To encourage discussions on evidence-based smoking cessation via twitter post Group 1 received daily auto-messages for the first 30 days followed by auto-messages 3x/week for 70 days Group 2 received one auto-message per day for the full 100 days" In addition, "Autofeedback" was used to -praise or encouraging engagement based on past 24-hour tweeting" And an 8 week supply of nicotine patches mailed to each participant		Group 1 vs Group 2 Abstinence rates post quit date At 7d- 50% vs 21 30d- 57% vs 61 60d- 42% vs 75 Total tweet volume 1125 vs 1742, p=.355		
Smoking Cessation "Tweet2 Quit" [17]	20+	Developmental trial	Twitter	40 Participants		100d			Engagement; Facilitation; Support
Smoking cessation "Picture Me Smokefree"[18]	19-24	Prospective, non-comparative study	FB	60 Participants	Photovoice-participant driven photography to engage themselves at an individual level about health behaviors and illness for health promotion	10m	Over the course of 12 weeks 10% reported quitting during participation, 51% reduced smoking, 24% reported no changes, and 5% stated relapsed, increased tobacco use, or already quit before the study.	User-driven, online intervention, to reflect critically about tobacco use; peer support for cessation	Facilitates quitting; Social support; User-driven

Smoking cessation intervention "crush the crave" [19]	19-29	Pilot study	FB	7282 Users	Daily posts about quitting plan, tracking of smoking habits and management of cravings, telephone-based help, notifications of money saved, virtual awards to praise performance, evidence-based information and social support	9m	Total reply to posts- 278, 214- smoking cessation, 64- marketing the intervention. 40.2% response to posts related to smoking cessation and 37.8% related to smoking-related experience	Original posts on Facebook page; maintained and continued through the responses by moderator; persons trying to quit while offering information;	Hand-holding for facilitation; Benefit-driven; Positive reinforcement; Communicating personal experiences
Physical Activity									
Physical activity "UniSA Run Free program" [20]	18+	Randomized controlled trial;	FB	89 Participants	IG: weekly post about running sessions, motivational quotes, and information with links, ask participants to post photos, posts prompting participants to answer questions, opinion polls CG: Self-directed running program only to follow without access to Facebook group	8wk	IG vs CG Self-reported MVPA overtime in both groups- p=0.004 Weekly MVPA- 140 vs 91 min/wk Improved social support- p=0.02 (time effect)	FB produced sizable and sustained changes in weekly MVPA, strong engagement, high compliance, and favorable feedback compared with self-administered format	Social cognitive theory
Exercise program "SHAPE UP" [21]	18+	Pilot study	Website	217 Participants	Participants randomly assigned to 3 groups G1: Control condition- online tools for enrolling in classes and recording their progress (basic website) G2: Media condition- two videos encouraging physical activity and one infographic with exercise instructions and motivational posts every week (basic website + promotional messages) G3: Social condition- a network of 4-6 anonymous "peers", composed of other participants of the Program(basic website + social network)	13wk	Overall class enrollment Social influence significantly increased overall enrollment than Control condition (p= 0.02); but Media condition was not significantly greater than the control condition (p=0.08) Effect on daily exercises Social group exercising moderately for an additional 1.6 days/wk than at the baseline,	Two key components- promotional messages and social influence for encouraging behavior change	Social support; Social influence

									compared with an extra 0.8 days/wk than control (p=0.02). Media group exercising on average 0.9 days more each week than at baseline, and insignificant from the control (p=0.74)
Walking intervention[22]	18	Randomized trial	FB	63 Participants	Facebook Social Support Group (IG) vs Standard Walking (CG) IG- received feedback on average steps/day, a pedometer, 8 paper logs to record steps taken/day, and weekly personalized step goal of increasing steps/day by 10% from previous week; recommendation not to exceed 15,000 steps/day via personal FB message from intervention leader CG- same as IG except for social support through Facebook	8wk	IG vs CG Increase of steps/wk- Over the course of study P<.0004 Physical activity increased from baseline- IG-136% CG-80%	Creation of a social support group using FB	Social support; Feedback
Sensitive Information									
Sexual health promotion "The FaceSpaceProject" [23]	16-29	Pilot study	FB, Twitter, Flickr, YouTube	900 Followers	Use fictional characters in videos with sexual health promotion messages & online interaction via social networking sites	1y	Total views on YouTube-5300 5 FB pages- 900 fans	Create a multi-disciplinary team, resources needed to maintain sites, interest generation, engagement of participants	Engagement; Anonymity
Substance abuse, sexual risk and violence Adelante Intervention[24]	12-24	Formative research	FB, Twitter, Instagram, Website, YouTube	35 Participants	Video-based dramatizations, sharing of stories through blog & video, prevention messages weekly through an ad, entertaining GIF or link to a news story using positive youth development framework	4y	A reliable, supportive resource to help youth move forward, received text messages. Decreased risk behavior related to substance use, sexual risk or interpersonal violence.	Emphasized social media as an engagement portal. Youth-centered program and participatory approach	Social modelling

CG-Control Group, d-days, FB-Facebook, G-Group, IG-Intervention Group, m-month(s), MVPA-moderate to vigorous physical activity, Wk-week(s), y-year(s)

To bring change in health behavior, health communications need to be both influential and persistent; part of the rituals and environment which define the usual routine. Evidence suggests that online platform has a positive impact through learning, socializing, and creativity in addition to enhancement of social contact, independence, communication, and emotional support from peers [28], [29].

Social media presents an unusual opportunity to identify and deliver health behavior interventions as dissemination of health information is faster than any media [30]. However, the assumption that social media platform is available and people will be using it anyhow is erroneous. Even when there is an acceptance of social media, its success in health promotion depends on the involvement and engagement of people. Social media platforms need to go beyond providing just information, they need to take into account both personal and environmental factors so that behavior change could be facilitated, the way the reviewed campaigns considered.

The studies reviewed did not include any intervention or campaign in India as none could be selected as per the decided selection criteria. In view of the use and acceptability of social media among young people in India and also because almost all health programs and health departments in India have developed websites or social media platforms and other digital applications, it is important that lessons for using social media in India for health behavior promotion could be learnt and implemented. It was observed that most of the social media platforms in health rely more on information-giving and do not do much to engage or involve people on a continuous basis.

Finally, it should not be forgotten that the modest effects which were found in the reviewed studies were primarily due to lack of theoretical basis. If constructs used in social media campaigns are grounded in appropriate theory, the likelihood of effect increases manifold.

This review was conducted to provide knowledge on the positive side of social media to change behavior in young people which could benefit in the long term. It also provides an overview of advancing research in the public health field. However, there are some limitations such as vigorous literature search was not done; the search strategy did not include names of social media platform. Also, age groups varied in this review. Many studies concluded the negative effects of social media [8], [9], [31], [32], [33] whereas, the aim of this review was to have an insight on the positive effects of social media to promote healthy behavior change in young individuals. Further, studies on the social media campaigns in India could further help in identifying constructs that are more important to tailor effective behavior change interventions via social media for Indian youth.

## Conclusion

With the exponential growth in web-based communication, social media has emerged as one of the

preferred or favored communication outlets. The evidence from the studies reveals that social networking sites can be effectively used to target audiences for HBCCI. However, its increasing use and its mere availability do not ensure effectiveness. The lessons which this review gives are that while social media is an accepted platform for youth, it will not be effective as a behavior change tool if it is used just for information-sharing. Thus, behavior change theories and social support ensuring engagement are a few recommended approaches for social media interventions to facilitate behavior change. These findings may guide the implementation of future health interventions for young people delivered via social media platforms in the Indian setting.

## Conflict of Interests

The authors declare no conflicts of interest.

## Ethical Approval

Not applicable.

## Acknowledgment

Not applicable.

## References

1. United Nations. Adolescent and Youth Demographics: A Brief Overview [Internet]. Available from: [https://www.unfpa.org/sites/default/files/resource-pdf/One\\_pager\\_on\\_youth\\_demographics\\_GF.pdf](https://www.unfpa.org/sites/default/files/resource-pdf/One_pager_on_youth_demographics_GF.pdf)
2. Ministry of Youth Affairs & Sports Government of India. National Youth Policy 2014 [Internet]. 2014. Available from: [https://www.youthpolicy.org/national/India\\_2014\\_National\\_Youth\\_Policy.pdf](https://www.youthpolicy.org/national/India_2014_National_Youth_Policy.pdf)
3. Sunitha S, Gururaj G. Health behaviours & problems among young people in india: Cause for concern & call for action. *Indian J Med Res.* 2014;140:185–208.
4. World Health Organization. Adolescents: health risks and solutions [Internet]. Available from: <https://www.who.int/news-room/fact-sheets/detail/adolescents-health-risks-and-solutions>
5. World Health Statistics 2018: Monitoring health for the SDGs [Internet]. World Health Organization. Available from: [https://www.who.int/gho/publications/world\\_health\\_statistics/2018/en/](https://www.who.int/gho/publications/world_health_statistics/2018/en/)
6. Global status report on alcohol and health 2018 [Internet]. Geneva: World Health Organization. Available from: [http://www.who.int/substance\\_abuse/publications/global\\_alcohol\\_report/msbgsruprofiles.pdf?0Ahttp://www.ncbi.nlm.nih.gov/pubmed/29355346](http://www.who.int/substance_abuse/publications/global_alcohol_report/msbgsruprofiles.pdf?0Ahttp://www.ncbi.nlm.nih.gov/pubmed/29355346)
7. Jonathan S. Hausmann, Currie Touloumtzis, White MT, Colbert JA, Gooding H. Adolescent and Young Adult Use of Social Media for Health and its Implications. *Physiol Behav.* 2017;176(3):139–48.
8. Rai G. Impact of Social Networking Sites (SNSs): Are Youth affected by its usage? *Issues Ideas Educ.* 2017;5(1):11–24.
9. Meena P, Mittal P, Solanki R. Problematic use of social networking sites among urban school going teenagers. *Ind Psychiatry J.* 2012;21(2):94.
10. Pashaei F, A.R.N. N, Tavakkol K. Young people experience of living with internet: A qualitative study. *Int J Behav Sci.* 2009;2(4):333–7.
11. Kuriala Kochuchakkalackal G, Eric Santos Reyes M. Development and Efficacy of Acceptance and Cognitive Restructuring Intervention Program on the Symptoms of Internet Gaming Disorder and Psychological Well-being of Adolescents: A Pilot Study. *Int J Behav Sci.* 2019;12(4):141–5.
12. Becker MH. "The Health Belief Model and Personal Health Behaviour." *Health Educ Monogr.* 1974;3:24–473.
13. Rogers E. *Diffusion of Innovations.* 5th ed. New York, Ny, Free Press, 2003.
14. Bandura A. *Social Foundations of Thought and Action.* Englewood Cliffs, NJ, Prentice-Hall, 1986.

15. Ajzen I. The theory of planned behavior. *Organ Behav Hum Decis Process*. 1991 Dec 1;50(2):179–211.
16. Jacobs MA, Cha S, Villanti AC, Graham AL. Using Tumblr to reach and engage young adult smokers: A proof of concept in context. *Am J Health Behav*. 2016;40(1):48–54.
17. Pechmann C, Pan L, Delucchi K, Lakon CM, Prochaska JJ. Development of a Twitter-based intervention for smoking cessation that encourages high-quality social media interactions via automessages. *J Med Internet Res*. 2015;17(2).
18. Haines-Saah RJ, Kelly MT, Oliffe JL, Bottorff JL. Picture me smokefree: A qualitative study using social media and digital photography to engage young adults in tobacco reduction and cessation. *J Med Internet Res*. 2015;17(1):e27.
19. Struik LL, Baskerville NB. The role of facebook in crush the crave, a mobile-and social media-based smoking cessation intervention: Qualitative framework analysis of posts. *J Med Internet Res*. 2014;16(7).
20. Looyestyn J, Kernot J, Boshoff K, Maher C. A web-based, social networking beginners' running intervention for adults aged 18 to 50 years delivered via a facebook group: Randomized controlled trial. *J Med Internet Res*. 2018;20(2):1–13.
21. Zhang J, Brackbill D, Yang S, Centola D. Efficacy and causal mechanism of an online social media intervention to increase physical activity: Results of a randomized controlled trial. *Prev Med Reports*. 2015;2:651–7.
22. Rote AE, Klos LA, Brondino MJ, Harley AE, Swartz AM. The Efficacy of a Walking Intervention Using Social Media to Increase Physical Activity: A Randomized Trial. *J Phys Act Health*. 2015;12:S18–25.
23. Gold J, Pedrana AE, Stoove MA, Chang S, Howard S, Asselin J, et al. Developing health promotion interventions on social networking sites: recommendations from The FaceSpace Project. *J Med Internet Res*. 2012;14(1).
24. Andrade EL, Evans WD, Barrett ND, Cleary SD, Edberg MC, Alvayero RD, et al. Development of the place-based Adelante social marketing campaign for prevention of substance use, sexual risk and violence among Latino immigrant youth. *Health Educ Res*. 2018;33(2):125–44.
25. Mcgloin AF, Eslami S. Digital and social media opportunities for dietary behaviour change. *Proc Nutr Soc*. 2014;74(2):139–48.
26. Prochaska J, Diclemente C, Norcross J. RR96-33 Baumol 1996.pdf. *Am Psychol*. 1992;47(9):1102–14.
27. Heldman A, Schindelar J, Weaver JB. Social Media Engagement and Public Health Communication: Implications for Public Health Organizations Being Truly "Social." *Public Health Rev*. 2013;35(1):1–18.
28. Anand S, Gupta M, Kwatra S. Social Media and Effective Health Communication. *Int J Soc Sci*. 2013;2(8):39–46.
29. Badri M, Nuaimi A Al, Guang Y, Rashedi A Al. School performance, social networking effects, and learning of school children: Evidence of reciprocal relationships in Abu Dhabi. *Telemat Informatics*. 2017;34(8):1433–44.
30. Moller AC, Merchant G, Conroy DE, West R, Hekler EB, Kugler KC, et al. Applying and advancing behavior change theories and techniques in the context of a digital health revolution: Proposals for more effectively realizing untapped potential. *J Behav Med*. 2017;40(1):85–98.
31. Abdulahi A, Jalil B, Lumpur K, Samadi MB, Gharleghi B. A Study on the Negative Effects of Social Networking Sites Such as Facebook among Asia Pacific University Scholars in Malaysia. *Int J Bus Soc Sci*. 2014;5(10):133–45.
32. Singh MM, Amiri M, Sabbarwal S. Social Media Usage: Positive and Negative Effects on the Life Style of Indian Youth. *Iran J Soc Sci Humanit Res*. 2017;5(3):123–7.
33. Sunar S, Priya VV, Gayathri R. Effect of social networking site on academic performance. *Drug Invent Today*. 2018;10(9):1814–6.