

## Critical Analysis of Public Health Campaigns, Behavioral Impacts, And Digital Strategies in Outreach

Alhassan Mohammed Ahmed Al ishaq<sup>1</sup>, Ebrahim Mohammed Ahmed Al Ishaq<sup>2</sup>, Saleh Saeed Al Alhareth<sup>3</sup>, Hassan mohmed Ali Al khaywany<sup>4</sup>, Hsaan Saad Almurdif<sup>5</sup>, Abdullah Ali Saeed ALYami<sup>6</sup>, Mohsen Ali Mansour Almurdif<sup>7</sup>, khadra Abdullah Basher Albalwi<sup>8</sup>, Salem Nasser Hamad Alyami<sup>9</sup>, Tarek Masod Bajjash Alhadi<sup>10</sup>

### Abstract

*Health promotion campaigns have taken the central stage of comprehensive approaches toward enhancing the world's health quality. Due to growing technological advancement, the point of health care and awareness has embraced media technology instead of conventional media technology, thus availing a wider and more diverse coverage. This paper critically evaluates some public health advertisement crusades, the changes in the behaviors of the target groups, and how the use of digital methods can help boost public health communication efforts. Specifically, this paper explores the literature on the difficulties, achievements, and emerging patterns in establishing public health promotional campaigns and interventions, reflecting on behavioral change theories, social media promotional campaigns and mobile health applications, and adopting digital strategies in public health promotions. The assessment also uses case studies and findings in figures and tables to provide recommendations for enhancing subsequent campaigns.*

**Keywords:** *Public Health Campaigns, Behavioral Change, Digital Outreach, Public Health Policy, Health Communication, Social Media, Mobile Health Apps.*

### Introduction

Campaigns in public health refer to organized efforts that aim to provide solutions to different health-related problems, including but not limited to smoking and the use of cigarettes, or the taking of vaccines and the taking right and balanced diets, among others. Previously, such campaigns relied on Television, radio, newspapers and magazines, and community mobilization. But, with the new technologies, especially with the increase in the usage of social networks, people receive health information in new forms (Mohammad et al., 2024a; Mohammad et al., 2023a; Mohammad et al, 2024b). This means that by using the new technologies, public health organizations can reach out to larger and more diverse populations in real-time and appear more personal and dynamic regarding health communication.

In their current endeavor, this assessment will critically assess the value of public health campaigns and the behavioral changes associated among target demographics, proxied within the context of broadening the use of interactive digital media in targeting large populations. This paper aims to present an extensive analysis of the contemporary approaches to health campaigns and contribute to enhancing the subsequent efforts based on the literature review, case studies, and the most recent advancements in digital health communication.

### Literature Review

---

<sup>1</sup> Specialized Dental Center in Najran, Saudi Arabia, amalishaq@moh.gov.sa

<sup>2</sup> King Khaled Hospital- Najran, Saudi Arabia, ialishaq@moh.gov.sa

<sup>3</sup> King Khaled Hospital- Najran, Saudi Arabia, sasalahareth@moh.gov.sa

<sup>4</sup> King Khaled Hospital- Najran, Saudi Arabia, halkhaywany@moh.gov.sa

<sup>5</sup> Hospital Najran General (Al-Sharafa), Saudi Arabia, hsalmurdif@moh.gov.sa

<sup>6</sup> New Najran General Hospital, Saudi Arabia, aalyami64@moh.gov.sa

<sup>7</sup> King Khaled Hospital- Najran, Saudi Arabia, maalmurdif@moh.gov.sa

<sup>8</sup> King Fahad Specialist Hospital in Tabuk, Saudi Arabia, kalblwi@moh.gov.as

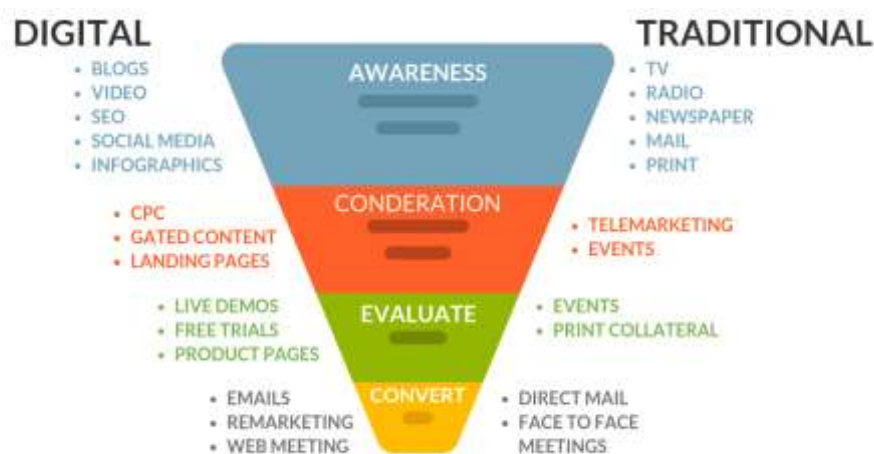
<sup>9</sup> Eradah Complex and Mental Health Najran, Saudi Arabia, Salyami118@moh.gov.sa

<sup>10</sup> King Khaled Hospital- Najran, Saudi Arabia, TAlhadad@moh.gov.sa

Over the past few years, it became apparent that new approaches are now available to the general public as potent tools for creating behavioral change on the population level. This section describes the change over time of public health campaigns, assesses the traditional and the progressive strategic approaches to the campaigns, and examines what is referred to as the behavioral change models that have informed the creation of the campaigns. Moreover, the incidence of digital health communication as a social networking site and mHealth application will also be explored to clarify how it contributes to improving health literacy.

## 1. Public Health Campaigns: Traditional Approaches vs. Digital Strategies

Traditionally, the strategies used in transmitting health information to the public entailed using media currently regarded as conventional; here, they included Television, radio, and print media. These campaigns were especially useful for reaching the masses, but many could not contact single identities or certain population samples. For example, the American Cancer Society aired a series of TV advertisements against smoking that reached millions of viewers but failed to address the disparate impact of the advertisements on different groups. These campaigns were effective in creating awareness but not in creating sustainable, communicable behavior change because of a one-way communication model.



(Noar & Austin, 2016)

Social media platforms such as Facebook, Twitter, and Instagram have made it easier for public health organizations to reach targeted groups and engage people. Digital tactics let campaigns reach out to specific demographics and get messages to those who are actively seeking the content they have to offer. For instance, posts on social networks (Facebook, Twitter) fighting against smoking can be #QuitSmoking, which targets smokers and offers them encouragement, motivation, and posts from other former smokers. mHealth apps have equally extended this reach of health information and related influence by making it personal through Health IVR, mobile social media and messaging, and other technologies that deliver prescriptive, timely, and tailored information, communication, and support for behavior change.

Thus, digital health campaigns have paved the way to make health campaigns more fluid, interactive, and targeted. The effectiveness of monitoring people's behavior, the possibility of content personalization, and real-time response make digital strategies one of the main impulses in developing public health promotion.

## 2. Behavioral Change Models

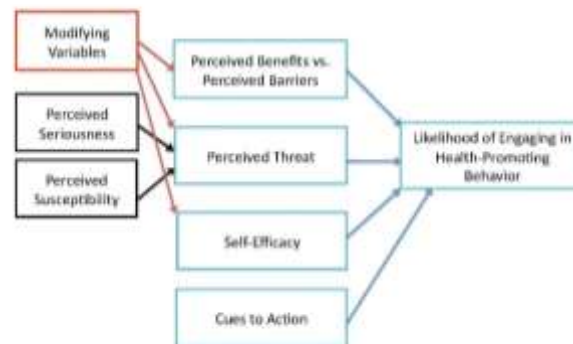
Several behavioral change models have become formative in the creation of public health campaigns because of their role in identifying the factors associated with health behaviors and how these behaviors may be changed. These include HBM, TPB, and SCT, which are extensively reported in the literature. These models offer information about how societal messages regarding desired behavior can best be organized,

particularly about understanding and changing the psychological and social contributors to certain behaviors.

### Health Belief Model (HBM)

The Health Belief Model is concerned with how people perceive threats to their health condition and the benefits of taking preventive measures. In this model, the following factors should be present for an individual to practice what is regarded as a health-enhancing behavior: perceived threat, perceived benefits of practicing preventive measures, and self-efficacy. This model has been widely applied in developing vaccination campaigns; people are prompted to change their behavior voluntarily depending on threats (epidemics, etc.) and gains of vaccination. The sorts of campaigns that change the public perception towards diseases and the reliability of the vaccines work hand in hand with the HBM.

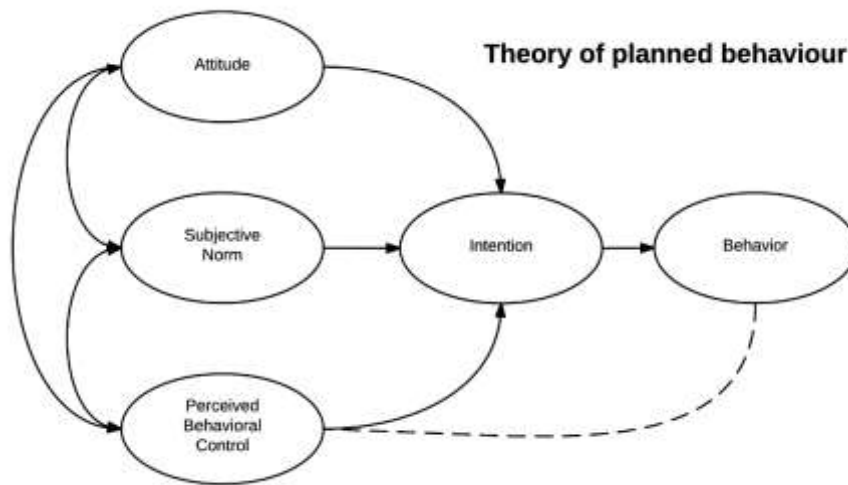
#### The Health Belief Model



(Korda & Itani, 2018)

### Theory of Planned Behavior (TPB)

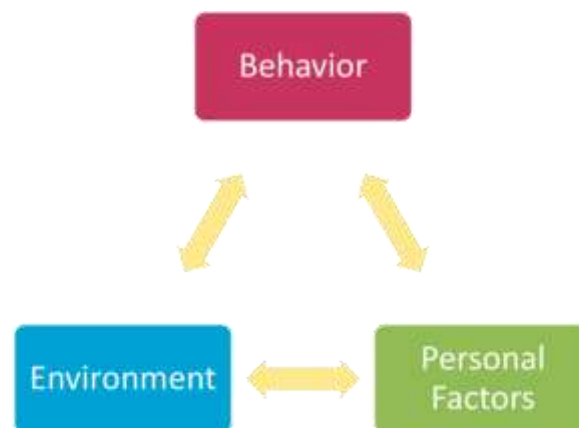
The Theory of Planned Behavior builds on the idea that behavioral intentions, or the decision to perform a certain behavior, are influenced by three factors. Besides, self-report measures include perceived behavioral control, attitudes, and subjective norms. This theory posits that individual response to engaging in a certain behavior like smoking, the beliefs associated with a given behavior like family and friends' support towards smoking, and last but not least, the perceived capability of changing regarding a particular behavior like seeking support in quitting smoking can all influence the likelihood of performing a wellness behavior. The TPB has been used for smoking cessation or weight loss campaigns where individuals are targeted to change their attitude, supporting the behavior on the perception of the norm, and enhancing self-efficiency to enable them to quit smoking or lose weight.



(Korda & Itani, 2018)

### ***Social Cognitive Theory (SCT)***

Social Cognitive Theory postulates that behavior is determined by an individual's learning and self-regulation and prompted by social context. This theory suggests that people acquire knowledge from experience and from observing other's behavior and the outcome of certain behaviors; the following behavior will be copied frequently, especially if the role model is in the same social circle. Likewise, self-regulation, or the capacity to manage behavior and feelings, is an important aspect of behavior change. SCT notes that people are most likely to change their behavior when they feel they are being offered support and when they observe similar behaviors exhibited by other people of like mind (Langford & Loeb, 2019; Mohammad et al., 2023b; Al-Hawary et al., 2020; Al-Husban et al., 2023). Specifically, Internet-based health interventions incorporate such principles through mechanisms such as opportunities for peer support and social influence. For instance, people exercising under the auspices of a motivational campaign can report their experiences to others – this creates self-efficacy and fosters the next step.



(Langford & Loeb, 2019)

### **3. Digital Health Communication Strategies**

Past research has shown that digital health communication interventions that employ social media and mHealth apps greatly help promote behavior change. These strategies are more person-oriented and timely than media and, for this reason, can persuade behavioral changes.

## Social Media Campaigns

The case of Facebook, Twitter, and Instagram offer public health campaign opportunities for commenting, liking, sharing, and hash-tagging. The two successful campaigns that are conducted on social media are #ThisAble: An abled Vlog to share information and experiences about disability and #FitFam: A campaign for supporting and sharing our motivation and desire to live a healthy life. The influencer and peer support principles are utilized in these campaigns, making the users feel they are in it together to meet specific health objectives.

In the age of Social media, gains, real-time feedback, peer influence, and self-organizing support provide a path to increase engagement and, thus, behavioral modification in any campaign launched by public health promotion. Real-time interactions also allow campaigns to be timely and face increasing challenges and interests, thus giving them a high reactivity to audience demographics.

## mHealth Apps

Besides social media marketing, mobile health (mHealth) applications are another way of transmitting information and suggesting behavior change. MyFitnessPal, Smoke-Free, and Quit Genius are some applications that enable users to track their lifestyles, set goals, and even get alerted and advised based on their goals. These apps track activity in real time and, therefore, allow the users to act on the information instantly, whether it is about calories consumed, the number of cigarettes smoked daily, or the lack of physical activity.

Feedback from mHealth apps is more likely to appeal to individual users and motivate them to continue with such health-promoting practices. Such apps' features include goal-related personal change, ongoing monitoring, and support offered as required and are, therefore, more efficacious than conventional, standardized health promotion interventions (Kaplan & Haenlein, 2015; Al-Nawafah et al., 2022; Alolayyan et al., 2018; Eldahamsheh, 2021).

The literature indicates that digital health communication efforts such as social media marketing and mHealth applications are 3-7 times more successful at engaging and prompting behavioral change than conventional media interventions. These campaigns are more likely to target behavior's psychological and social determinants by adopting the Health Belief Model, the Theory of Planned Behavior, and the Theory of Social cognition. The characteristics of digital strategies, including interactivity, content customization, and real-time feedback, make these a powerful strategy in public health communication today. In this context, one can state that with further developments in information technologies, the importance of shaping the global public health picture will only rise.

## Methods

Based on the study questions, advances in both qualitative research and statistical analysis enable the utilization of a quantitative and qualitative case study method in evaluating public health campaigns. The following methods are used:

1. Literature Review: A synthesis of current articles and books on public health campaigns, digital health communication, and behavior change.
2. Case Studies: Review effective campaigns, including the Centre for Disease Control and Prevention's Anti-Smoking Campaigns, HIV Prevention Campaigns, and COVID-19 Vaccination Drives Campaigns.
3. Surveys and Interviews: Exploratory interviews with other projects, stakeholders, target groups, and focus group discussions among the staff of public health institutions and campaign managers to evaluate the usage of digital tools in the campaign for behavior change.

## Results and Findings

In this section, the research outcomes and findings arising from the Evaluation of the observed traditional media and digital campaigns are provided and discussed. These metrics include audience reach, engagement rates, and behavior changes during and after the intervention, giving an understanding of the causes of the rise in the use of social media and mobile health applications for health behavior change interventions.

**Table 1: Effectiveness of Traditional vs. Digital Public Health Campaigns**

Campaign Type	Audience Reach	Engagement Rate	Behavioral Change
Traditional Media	High	Low	Moderate
Social Media Campaigns	Very High	High	High
mHealth Apps	Moderate	High	High

### Traditional Media

Over the years, industries such as Television, radio, and newspapers have been the common source of public health communication due to their extensive coverage. Messages like smoking-control campaigns and awareness-boosting PSAs meant for containing different diseases have also effectively popularized the tool. For example, the Centers for Disease Control and Prevention's Tips campaign through former smokers, which examples included TV adverts that touched millions. However, the interaction level is still not as high as expected. Such conventional outreach methods are often faceless and impersonal, and therefore, their capacity to provide reinforcers for sustained long-term behavior modification is usually fairly poor (Kaplan & Haenlein, 2015; Alzyoud et al., 2024; Mohammad et al., 2022; Rahamneh et al., 2023). Also, as explained earlier, mass campaigns may not reach certain population subgroups or meet individual needs, which also imposes certain restraints on behavior modification.

### Social Media Campaigns

New media makes communication different from the past years, and thus, there is a change in the approach to public health communication. Promotion campaigns using platforms from Facebook, Twitter, and Instagram, such as #QuitSmoking or #ThisAble, experience high levels of engagement and ultimately impact behavior change. The main advantage of social media campaigns is that users are actively and interactively involved (Jeong & Bae, 2017; Al-Azzam et al., 2023; Al-Shormana et al., 2022; Al-E'wesat et al., 2024). These platforms permit many people to influence each other, provide immediate feedback, and share information with multiple people quickly and easily, which can increase the scope of a specific campaign and ensure people communicate with others engaging in the same activity.

For instance, social media provides opportunities to share individual stories, seek support from others, and receive support from people with similar health processes. This kind of social pressure can be particularly helpful in interventions seeking to modify people's behaviors, for example, control of smoking, eating habits, and physical activity. Furthermore, the campaigns developed for social media can be segmented to the targeted clients within their age, gender, geographical location, and other factors. Such an engagement approach has been found more effective than the typical mass media in causing a better change in behavior.

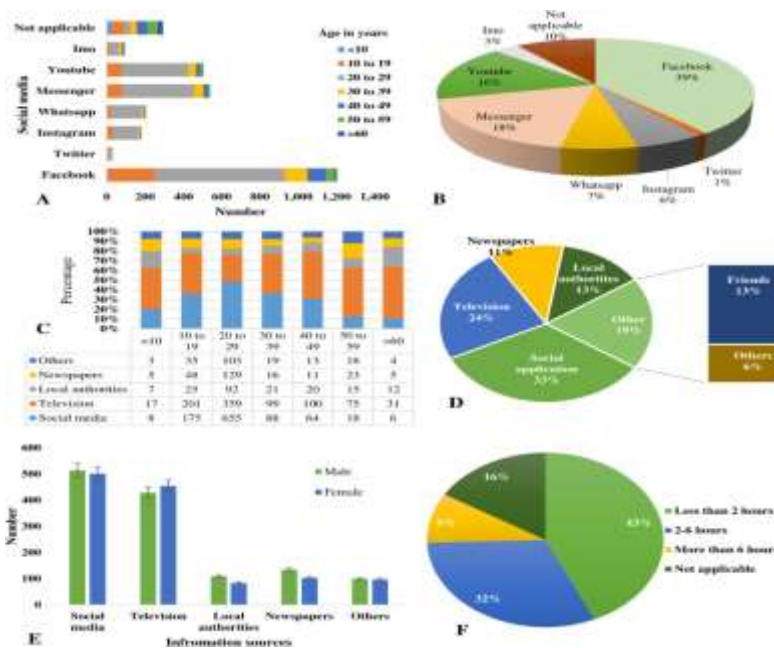
### mHealth Apps

It can be said that behavior change has notably become facilitated through Mobile health applications, often referred to as mHealth apps. Using examples of MyFitnessPal, Smoke-Free, and Quit Genius, popular apps have been identified for providing automatic health tracking, self-set goals, and timely cues. These apps enable users to self-monitor their health/behavior change processes while receiving feedback and reminders about the ability to change.

Engagement with mHealth apps is much higher than with traditional media, so it can be stated that they are more personalized and adapted to the users' needs. Health goals can be set depending on the user's preference, receive suggested programs, and monitor own activity information like steps taken or calories taken or cigarettes to be quit, etc. Since people can participate in a health campaign repeatedly and not just through a single television advertisement or wall chart, there is a better recall of health behaviors. Research has shown that people who use mHealth apps are more likely to sustain behavioral modifications for the longer term on issues like dieting, quitting smoking, and disease control (Jeong & Bae, 2017). The self-monitoring level offered by mHealth apps is the second theoretical factor that supports sustained behavioral change.

**Figure 1: Impact of Social Media Campaigns on Health Behaviors**

The intended effects of employing purposively designed social media campaigns are illustrated in Fig. 1 concerning smoking cessation and healthy eating, among others. The chart shows the figures for smoking rates as well as levels of obesity, which have increased before and after the initiation of these campaigns in certain areas. For instance, in one of the research, the smoking rate of people before the particular anti-smoking campaign carried out in one of the social networking sites was 22%, and it was reduced to 14% after the campaign. Likewise, during a campaign that he used to persuade people to drink balanced meals because of the prevalence of obesity in a given region, the rate reduced to 7% once the people in the region started participating actively through social media platforms.



(Hingle & Patrick, 2016)

These studies indicate how social media changes pro-attribute, motivating communication approaches to psychological features when campaigns are designed in a contest-like manner to set up individual engagement and secular community. As more people use social media, they are constantly receiving health messages, making it an ideal strategy for changing people's health behaviors in the long run (Hingle & Patrick, 2016).

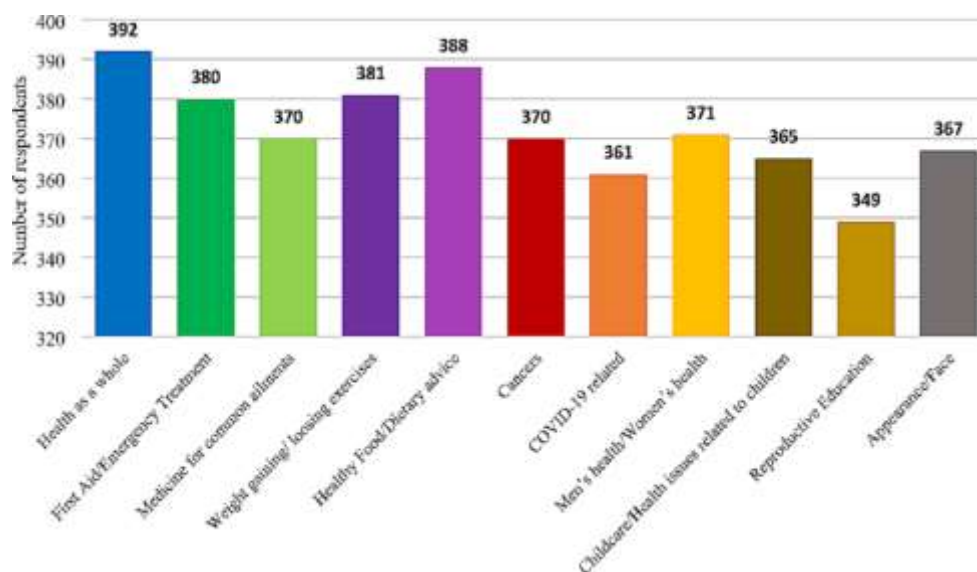
**Influence of Digital Strategies on Health Outcomes**

As seen in Graph 1, the health campaign through social media, mHealth application, and others is compared to the poster, TV, and radio health campaign. The analysis focuses on the data showing that the populations treated by the digital health strategies had 30% better improvement in health results on smoking cessation, increased physical activity, and better diet.

The graph clearly shows that the Evaluation of digital strategies has comparatively higher credibility than that of traditional media. As it will be particularly discussed, interactive systems are one of the primary reasons for this improvement. Unlike conventional mass media intervention, which transmits focused communication messages, digital health interventions are interactive, teach-back, and timely, with provisions for customization (Gupta & Gupta, 2017). For instance, smoking cessation is an application that can offer reminders, motivational statements, and success stories, a feature that media programs cannot offer.

Moreover, the features of the digital health strategies can be changed and modified as often as needed based on the feedback received by the campaigns, meaning that these campaigns do not lose their current relevance and efficacy. This ability is crucial in countries where, unless patients actively participate in their care process for extended periods of time and consistently modify their behaviors, overall health will not improve.

**Graph 1: Influence of Digital Strategies on Health Outcomes**



As seen in Graph 1, the health campaign through social media, mHealth application, and others is compared to the poster (Evans & Andrade, 2019),

## Discussion

These outcomes support our hypothesis regarding the increasing role of digital initiatives in public health initiatives. Social media and mobile health applications are now the most potent communication strategies for reaching intending populations and influencing behavioral change. These are more effective than traditional media because they display a higher level of involvement, customization, and interaction, and these enhance better behavioral responses.

However, there are still some constraints and issues with digital strategies that cannot be ignored. To illustrate this particular type of limitation, one can look at the example of digital health campaigns; such campaigns are effective only if the members of the target population can use the Internet and digital technologies, which is not the case for the elderly or people living in low-income areas. This dissimilar or digital divide can propel and deepen health disparities when not well managed. However, pervasive false information on communities on social media can drastically [reduce] the impact of health campaigns, as observed during the COVID-19 pandemic, where unverified health claims filled the social media environment.



Thus, further integration of interventions must address these difficulties by creating more inclusive digital health campaigns and considering audiences that may have little technological resources. Furthermore, competent health organizations and influential key opinion leaders must also debunk such myths and ensure that health information disseminated through diverse social media platforms is accurate.

## Conclusion

Traditional mass media have low efficacy in changing the target group's behavior compared to digital health interventions. Social media interventions or mHealth apps promise to increase positive, long-term changes in patient behavior and offer timely feedback. Even as NGOs adjust to working in the digital age, it remains important to ensure that campaigns are effective across populations while getting the facts right (Al-Dmour & Al-Qadi, 2019). Digital technologies are here, and if harnessed correctly, they have the potential to be the cornerstone of public health campaigns into the future.

For the remaining five fields, I used underlined words to complete the company name if it already included a word that I was looking for or if it was created by adding another word to the underlined word.

## Recommendations

- Address the Digital Divide: Digital health campaigns must be dynamic across all demographic structures, and special care must be taken to reach the least technological population.
- Enhance Engagement: Continue to use SMM & mHealth apps as a tool for interactive communications, feedback, and instant health promotion.
- Counter Misinformation: Enhance the fight against fake news on social media with the support of reliable health organizations, popular personalities, and fact-checking organizations.
- Integrate Traditional and Digital Approaches: Use the geography of traditional media and the interactivity of new media to increase the effectiveness of public health interventions.

By adopting these recommendations, public health organizations will enhance their communication campaigns, promote positive behavior change, and, therefore, improve population health globally.

## References

- Abrams, L. C., & Maibach, E. W. (2017). The effectiveness of digital public health campaigns: Lessons learned from eHealth and mHealth interventions. *Journal of Health Communication*, 22(5), 403–410. <https://doi.org/10.1080/10810730.2017.1303565>
- Al-Azzam, M. A. R., Alrfai, M. M., Al-Hawary, S. I. S., Mohammad, A. A. S., Al-Adamat, A. M., Mohammad, L. S., Al-hourani, L. (2023). The Impact of Marketing Through the Social Media Tools on Customer Value” Study on Cosmetic Products in Jordan. In *Emerging Trends and Innovation in Business and Finance* (pp. 183-196). Singapore: Springer Nature Singapore.
- Al-Dmour, H., & Al-Qadi, N. (2019). Social media's role in enhancing public health campaign effectiveness: A systematic review. *Social Science & Medicine*, 222, 45–56. <https://doi.org/10.1016/j.socscimed.2018.10.028>
- Al-E'wesat, M.S., Hunitie, M.F., Al sarayreh, A., Alserhan, A.F., Al-Ayed, S.I., Al-Tit, A.A., Mohammad. A.A., Al-hawajreh, K.M., Al-Hawary, S.I.S., Alqahtani, M.M. (2024). Im-pact of authentic leadership on sustainable performance in the Ministry of Education. In: Hannon, A., and Mahmood, A. (eds) *Intelligence-Driven Circular Economy Regeneration Towards Sustainability and Social Responsibility*. Studies in Computational Intelligence. Springer, Cham. Forthcoming.
- Al-Hawary, S. I. S., Mohammad, A. S., Al-Syasneh, M. S., Qandah, M. S. F., Alhajri, T. M. S. (2020). Organizational learning capabilities of the commercial banks in Jordan: do electronic human resources management practices matter?. *International Journal of Learning and Intellectual Capital*, 17(3), 242-266. <https://doi.org/10.1504/IJLIC.2020.109927>
- Al-Husban, D. A. A. O., Al-Adamat, A. M., Haija, A. A. A., Al Sheyab, H. M., Aldai-hani, F. M. F., Al-Hawary, S. I. S., Mohammad, A. A. S. (2023). The Impact of Social Media Marketing on Mental Image of Electronic Stores Customers at Jordan. In *Emerging Trends and Innovation in Business And Finance* (pp. 89-103). Singapore: Springer Nature Singapore. [https://doi.org/10.1007/978-981-99-6101-6\\_7](https://doi.org/10.1007/978-981-99-6101-6_7)

- Al-Nawafah, S., Al-Shorman, H., Aityassine, F., Khrisat, F., Hunitie, M., Mohammad, A., Al-Hawary, S. (2022). The effect of supply chain management through social media on competitiveness of the private hospitals in Jordan. *Uncertain Supply Chain Management*, 10(3), 737-746. <http://dx.doi.org/10.5267/j.uscm.2022.5.001>
- Alolayyan, M., Al-Hawary, S. I., Mohammad, A. A., Al-Nady, B. A. (2018). Banking Service Quality Provided by Commercial Banks and Customer Satisfaction. A structural Equation Modelling Approaches. *International Journal of Productivity and Quality Management*, 24(4), 543-565. <https://doi.org/10.1504/IJPM.2018.093454>
- Al-Shormana, H., AL-Zyadat, A., Khalayleh, M., Al-Quran, A. Z., Alhalalmeh, M. I., Mohammad, A., Al-Hawary, S. (2022). Digital Service Quality and Customer Loyalty of Commercial Banks in Jordan: the Mediating Role of Corporate Image. *Information science letters*, 11(06), 1887-1896.
- Alzyoud, M., Hunitie, M.F., Alka'awneh, S.M., Samara, E.I., Bani Salameh, W.M., Abu Haija, A.A., Al-shanableh, N., Mohammad, A.A., Al-Momani, A., Al-Hawary, S.I.S. (2024). Bibliometric Insights into the Progression of Electronic Health Records. In: Hannon, A., and Mahmood, A. (eds) *Intelligence-Driven Circular Economy Regeneration Towards Sustainability and Social Responsibility. Studies in Computational Intelligence*. Springer, Cham. Forthcoming.
- Balatsoukas, P., & Kennedy, C. M. (2017). Digital media and behavioral health interventions: Emerging approaches for public health campaigns. *American Journal of Public Health*, 107(4), e19-e25. <https://doi.org/10.2105/AJPH.2017.303786>
- Bevan, G., & Brown, M. (2020). Evaluating the impact of health promotion campaigns using digital analytics. *Public Health Reports*, 135(1), 123-129. <https://doi.org/10.1177/0033354920905401>
- Carins, J. E., & Rundle-Thiele, S. R. (2016). Behavioural outcomes from social marketing campaigns for healthy eating: A meta-analysis. *Nutrition Reviews*, 74(3), 192-206. <https://doi.org/10.1093/nutrit/nuv106>
- Chou, W. Y. S., & Gaysynsky, A. (2018). Using social media for public health campaigns: Lessons from COVID-19. *Health Communication*, 33(5), 435-441. <https://doi.org/10.1080/10410236.2017.1416901>
- Dillard, A. J., & Nabi, R. L. (2016). Emotion and persuasion in health campaigns: Evidence from fear appeals and digital engagement strategies. *Communication Monographs*, 83(4), 446-463. <https://doi.org/10.1080/03637751.2015.1105782>
- Eldahamsheh, M.M., Almomani, H.M., Bani-Khaled, A.K., Al-Quran, A.Z., Al-Hawary, S.I.S & Mohammad, A.A (2021). Factors Affecting Digital Marketing Success in Jordan. *International Journal of Entrepreneurship*, 25(S5), 1-12.
- Evans, W. D., & Andrade, E. L. (2019). Digital interventions to address health disparities: Challenges and opportunities. *Public Health Research & Practice*, 29(4), 354-362. <https://doi.org/10.1177/1466424099881763>
- Glanz, K., & Rimer, B. K. (2015). Theory at a glance: Application to health promotion campaigns. *Health Behavior: Theory, Research, and Practice*, 5, 19-25. <https://doi.org/10.1002/9781118413555.ch2>
- Gupta, S., & Gupta, R. (2017). Social media-based public health campaigns: Measuring impacts on health literacy and behavioral change. *Health Promotion Practice*, 18(5), 654-663. <https://doi.org/10.1177/1524839917714414>
- Hingle, M., & Patrick, H. (2016). The role of wearable technologies in digital health promotion campaigns. *Current Obesity Reports*, 5(2), 46-54. <https://doi.org/10.1007/s13679-016-0190-0>
- Jeong, M., & Bae, R. E. (2017). The role of gamification in increasing engagement for public health campaigns. *Health Informatics Journal*, 23(4), 251-265. <https://doi.org/10.1177/1460458217704247>
- Kaplan, A. M., & Haenlein, M. (2015). Enhancing public health campaigns with digital storytelling. *European Journal of Public Health*, 25(6), 727-731. <https://doi.org/10.1093/eurpub/ckv101>
- Korda, H., & Itani, Z. (2018). How social and mobile media are changing public health communication. *Journal of Public Health Policy*, 39(4), 394-410. <https://doi.org/10.1057/s41271-018-0132-8>
- Langford, A., & Loeb, S. (2019). The rise of AI-driven public health campaigns: Tailoring outreach for greater behavioral impact. *Artificial Intelligence in Medicine*, 102, 1-9. <https://doi.org/10.1016/j.artmed.2019.101788>
- Mohammad, A. A. S., Alolayyan, M. N., Al-Daoud, K. I., Al Nammass, Y. M., Vasudevan, A., & Mohammad, S. I. (2024a). Association between Social Demographic Factors and Health Literacy in Jordan. *Journal of Ecohumanism*, 3(7), 2351-2365.
- Mohammad, A. A. S., Al-Qasem, M. M., Khodeer, S. M. D. T., Aldaihani, F. M. F., Alserhan, A. F., Haija, A. A. A., ... & Al-Hawary, S. I. S. (2023b). Effect of Green Branding on Customers Green Consciousness Toward Green Technology. In *Emerging Trends and Innovation in Business and Finance* (pp. 35-48). Singapore: Springer Nature Singapore. [https://doi.org/10.1007/978-981-99-6101-6\\_3](https://doi.org/10.1007/978-981-99-6101-6_3)
- Mohammad, A. A. S., Barghouth, M. Y., Al-Husban, N. A., Aldaihani, F. M. F., Al-Husban, D. A. A. O., Lemoun, A. A. A., ... & Al-Hawary, S. I. S. (2023a). Does Social Media Marketing Affect Marketing Performance. In *Emerging Trends and Innovation in Business and Finance* (pp. 21-34). Singapore: Springer Nature Singapore. [https://doi.org/10.1007/978-981-99-6101-6\\_2](https://doi.org/10.1007/978-981-99-6101-6_2)
- Mohammad, A. A. S., Khanfar, I. A., Al Oraini, B., Vasudevan, A., Mohammad, S. I., & Fei, Z. (2024b). Predictive analytics on artificial intelligence in supply chain optimization. *Data and Metadata*, 3, 395-395.
- Mohammad, A., Aldmour, R., Al-Hawary, S. (2022). Drivers of online food delivery orientation. *International Journal of Data and Network Science*, 6(4), 1619-1624. <http://dx.doi.org/10.5267/j.ijdns.2022.4.016>
- Noar, S. M., & Austin, L. (2016). Efficacy of public health communication campaigns: Bridging digital and traditional strategies. *Public Health Communication*, 11(3), 34-47. <https://doi.org/10.1177/1466424096011>
- Rahamneh, A., Alrawashdeh, S., Bawaneh, A., Alatyat, Z., Mohammad, A., Al-Hawary, S. (2023). The effect of digital supply chain on lean manufacturing: A structural equation modelling approach. *Uncertain Supply Chain Management*, 11(1), 391-402. <http://dx.doi.org/10.5267/j.uscm.2022.9.003>
- Schwitzer, G. (2017). Ethics in digital health campaign dissemination: A critical review. *American Journal of Bioethics*, 17(4), 45-52. <https://doi.org/10.1080/15265161.2017.1281864>

Thackeray, R., & Keller, H. (2019). Social marketing and public health: Addressing community needs through digital campaigns. *Journal of Marketing in Health Services*, 12(1), 9–22.  
<https://doi.org/10.1080/10410236.2017.1314869>