Research Article

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Journal of Healthcare Communications

2021
Vol.6 No.S4:17

Analysing the Impact of Social Media for Extending Outreach of Hypertension Services in a Northern State of India: A Computational Study on Twitter

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Citation: Goel S, Upadhyay K, Jaswal N, Malhotra G, Ghosh L, et al. (2021) Analysing the Impact of Social Media for Extending Outreach of Hypertension Services in a Northern State of India: A Computational Study on Twitter. J Health Commun Vol.6 No.S4:17.

Abstract

Introduction: Integrated communication media strategy has been used to extend outreach of preventive services for different diseases. Limited literature is available in addressing hypertension through such unified media strategy, especially using twitter as a social media tool. The present study aimed to document an integrated communication media strategy using twitter for extending reach of hypertension services on social media.

Methods: The study used an exploratory quantitative research design using an integrated model of media communication, developed through an extensive literature review and iterative delphi technique. The context specific messages *viz.* text, photographs, videos or infographics at specific time intervals (3-4 posts/day), targeting prevention of hypertension were developed and posted on twitter handle over a period of 9 months (December-August, 2020). For evaluation of the intervention, key indicators namely audience, applause, amplification, visibility were analyzed.

Results: The study showed that there has been an exponential growth in number of followers during implementation of intervention. An exponential growth in applause, impressions and engagements were recorded in the respective time span. The maximum visibility was recorded in the month of July with (User Profile Clicks= 38, URL clicks = 35, and Hashtag clicks= 4).

Conclusion: The integrated media intervention using twitter has been successful in extending outreach of hypertension prevention services. The model focused upon context-specific twitter messages highlighting hypertension to diverse stakeholders, which indicates potential of twitter in widespread dissemination of messages pertaining to hypertension for awareness and advocacy.

Keywords: Twitter; Social media; Communication models; Hypertension

Received: June 25, 2021; **Accepted:** July 09, 2021; **Published:** July 16, 2021

Introduction

Hypertension is one of the key public-health challenges worldwide because of its high morbidity and mortality due to non-communicable diseases [1]. It is a well-known risk factor of various heart, brain and kidney diseases which accounts for around 1.8 million premature deaths worldwide [2-5]. As per latest Global Burden of Disease (GBD) data, it is responsible for highest number of deaths for both sex combined, all ages, in year 2019 [6]. An estimated 1.13 billion people living in low and middle-income countries have hypertension globally. According to World Health Organization (WHO), 1 in 4 men and 1 in 5 women had reported hypertension [7]. It has been estimated that the total economic loss due to cardiovascular diseases (hypertension being primary risk factor) in low and middle income countries between 2011 and 2015 was around $3.7 trillion, representing 2% of Gross Domestic Product (GDP).

Hypertension adds a considerable public health burden in the healthcare systems in India, leading to 57% deaths by stroke and 24% by Coronary Heart Disease (CHD) [8,9]. India had suffered the highest loss in potentially productive years of life in people aged 35-64 years due to Cardio Vascular Diseases (CVDs) [10]. With the increasing prevalence of non-communicable diseases especially hypertension in limited low resource settings, low-cost approaches focusing on awareness and behaviour change have

been demonstrated to be effective in improving the health and well-being of the populations [11].

In recent times, social media has revolutionized people's lifestyle by creating awareness and inculcating behaviour change in various fields such as Non-profit organisations, physicians, urologist, dentist, dieticians and many more [11-15]. India boasts of second highest number of internet usage and the also caters among the largest population on Facebook, Google, YouTube [16,17]. With the comfort of cyberspace (internet) access, the number of active social media handlers in India mounted at 330 million in 2019 and is anticipated to reach 448 million by 2023 [18]. Social media handles such as Face book, Twitter, Linked are being widely used for searching health or medical related information latest news, conferences, online meetings, peer communication, education and medical advertising [11,19]. Also, health information searched online was found to influence future health care decisions [20].

A surge in the use of social media has been observed after the arrival of COVID-19 pandemic be it the world's general population, celebrities, world leaders, or professionals. Social media channels have been used to spread information, find humor and distraction from the pandemic, *via* Internet memes [21,22]. In addition to being a global threat, COVID-19 is referred to as an infodemic. The direct access to content through platforms such as Twitter and YouTube leave users susceptible to rumours and questionable information [23]. This information can strongly influence individual behaviours, and limit the group cohesion.

Various studies have shown that social media is being effectively used in communicating hypertension related information to general public by means of creating groups and pages related to hypertension [24-27]. There is ample evidence that the community programs help in reducing the hypertension and improving cardiovascular health [27]. Partnering with patients using social media has been used as an effective strategy in the management of hypertension [26]. Twitter is considered as an important source for sharing information and has been an effective and efficient means of disseminating health related news and public health concerns such as Ebola, H1N1, etc [28,29]. Despite its popularity and frequent use in recent times, there are lack of studies documenting its use and effectiveness in hypertension. Most literature on effectiveness of twitter in disseminating information on hypertension is limited to western countries. The objective of this study is to document an integrated communication media strategy using twitter for extending reach of hypertension services on social media.

Methods and Design

Study setting

A project on strengthening hypertension services in the state of Punjab was implemented by Post Graduate Institute of Medical Education and Research, Chandigarh, an autonomous institute of excellence under Act of Parliament, Government of India in conjugation with Strategic Institute for Public Health Education and Research (SIPHER), and an advocacy focused civil society and Global Health Advocacy Incubator (GHAI), USA [30]. Punjab is an agrarian state in the northwest region of India endowed with rich tradition and culture. The total population of the state is 28 million with 100% lines in rural area. It is also a state with high literacy level and amongst highest GDP [31]. As per National Family Health Survey-4 (2015-16) and District Level Health Survey-4 (2012-13), Punjab is one of the high burden states in India having an unadjusted high prevalence of hypertension to be 35.7% (Men-41%, women-25.4%) against the prevalence in India as 25.3% [32]. Further, the state-wise DALY for high blood pressure was amongst the highest at 4000 per 100,000 as reported in Global Burden of Disease report, 2016.As per Telecom Regulatory Authority of India (TRAI) data, over 70% of population (22.4 million) in the Punjab state use internet on phone, making it the second ranked state in terms of internet subscribers on mobile, after Delhi [33]. Also, the use of social media in all age groups has grown substantially over the past decade [34].

Study design

This descriptive quantitative study was designed using STROBE checklist and conducted in between December, 2019 to August 2020. Target group included the experts working in the field of hypertension, politico-administrative jobs and public health. Appropriate hastags were used to facilitate a search for a specified topic of interest.

Media intervention strategy

For the purpose of this study, an integrated model of media communication (based on 3 models of communication *viz.* Communication campaign model, PESO model, and Staircase model) was used to frame the media strategy for management and prevention of hypertension in the state of Punjab [35]. The Communication campaign model was used to design the structure of the strategy; PESO model was used to select the tools of media strategy and social staircase model was used for the implementation of the strategy **(Figure 1)** [36,37].

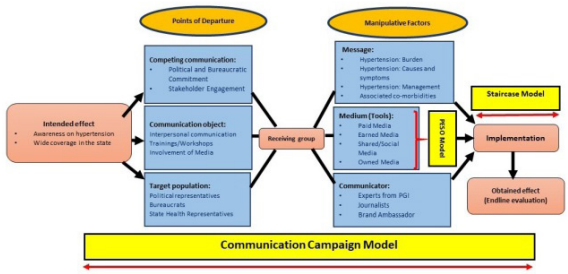

Figure 1: Integrated Model of Communication.

Under the 'intended effect' section of integrated communication model, the objective was to increase the awareness of hypertension to a large scale of population of Punjab through twitter handle. The 'points of departure' section described three components: competing communication, communication object, and target population. Under 'competing communication' we ensured to indulge people in higher positions like bureaucrats, senior officials and other key stakeholder (target population) for successful implementation of the intervention. In this, we hash tagged key stakeholders and organizations besides posting of messages from their handles (communication object) to extend the reach of intended message.

Under the 'manipulative factors', diverse messages highlighting the symptoms of hypertension, its management and co morbidities associated with hypertension were disseminated. In order to build credibility of the intervention, earned, shared, and owned media post were published on the twitter handle (*viz.* PESO model). At the end social staircase model was used for the implementation of the strategy in which a monthly social media calendar was designed for posting the regular social media feed on twitter handle of project. The well designed self-created posts were planned in the form of text, photographs, videos or info graphics at specific time intervals (3-4 posts/day).

Evaluation of intervention

For evaluation of the intervention key indicators namely audience, applause, amplification, visibility were analyzed. The 'audience' was analyzed through number of followers of the twitter handle; 'applause' by tweet, re-tweets (number of times the tweet is reposted) and likes; 'amplification' through impressions (number of times our digital content was served up to the audience) and 'engagements' (implies to the comments, likes, shares, clicks, or any other measurable interaction with the digital content); and visibility through user profile clicks (counts the click on the username, or profile photo), hashtag clicks (reckons the clicks on hashtags in the tweet) and the URL clicks (website address that a visitor goes when he/she clicks on the post).

Ethical approval

The study was ethically approved from the Institute's Ethical Committee, Postgraduate Institute of Medical Education and Research (PGIMER), Chandigarh (PGI/IEC/2019/002357).

Results

The study shows that there has been an exponential growth in number of followers during implementation of intervention. The months of February and June recorded the greatest number of followers. Further, the number of applause in terms of likes and retweets for particular post increased with time with month of July receiving maximum applause (Likes=275, Retweets=165). An exponential growth in both impressions and engagements was recorded in the respective time span. While the frequency of impression increased to 87712 till the month of August, 2020, the engagements rose to 2007 for the same month. The maximum visibility was recorded in the month of July with (User Profile Clicks=38, URL clicks=35, and Hash tag clicks=4) **(Figure 2)**.

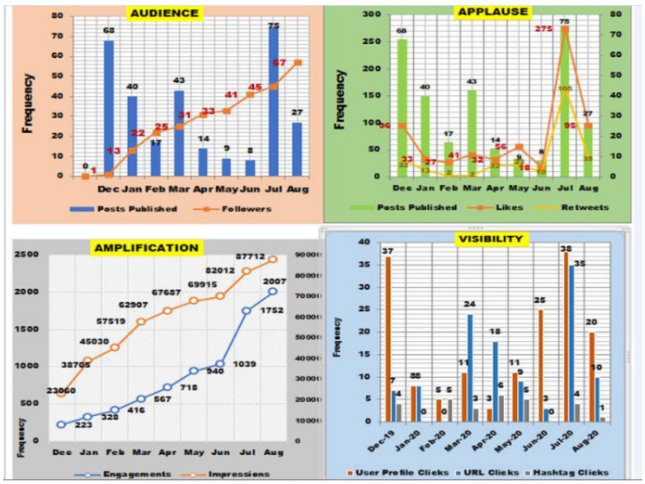

Figure 2: Implementation of social media twitter strategy on outreach of hypertension.

Discussion

Hypertension has been identified as one of the leading cause of cardiovascular disease and premature death worldwide. It is the third most important attributable risk factor for burden of disease in South Asia (2010) and contributes to 57% death due to stroke and 24% by Coronary Heart Disease (CHD) death in India [37]. This is first study to systematically analyse the effect of an integrated communication strategy related to hypertension through twitter platform for generating advocacy among diverse stakeholders in the state of Punjab. The integrated communication model developed in the study harnessed the strength of three scientific models (Campaign Model, PESO Model and Social Staircase Model) for effectively framing structure, tools and implementation of the media strategy [37,39]. The existing studies used different mass media strategies on awareness generation, regarding various diseases and its risk factors including salt reduction for preventing hypertension [40-42]. Further, limited evidence exists on the development and use of a conceptual framework for twitter in undertaking advocacy and increasing awareness on a public health issue like hypertension.

We ensured use of twitter as an intervention because of its characteristic as a public relation tool and an advocacy instrument [43-45]. The platform is one of the most popular form of social media used by health professionals due to the simplicity and choice of developing connection along with information sharing and communication [46,47]. Majority of people are already using Twitter as an advocacy platform in exchanging the most current information needed to educate the general public [48]. Parallel to our study, various studies have used twitter analytics for analysing possible indicators related to cardiovascular disease, Human Papilloma Virus (HPV), eating disorders and common health conditions [49-52]. Further, the indicators used in the study such as tweet volume, re-tweet volume, impressions, and spread for selected hashtags were also used by various studies in the field of urology, oncology and liver diseases [53-57].Twitter as a platform has successfully gathered the international community

and has helped in raising awareness about the subject which are less explored. In addition it offers a unique opportunity to disseminate information in real time through its chat mechanism.

In this study, we witnessed a significant rise in retweet activity and a modest rise in the number of influential twitter accounts between the study periods. Although it is hard to ascertain the exact motives behind this improved activity through this analysis, the findings indicate the rising impact of the media strategy used in the project. Previous studies have also found that the frequency of hash tags, and tweets/retweets frequency increases over a period of time with such intervention [53-57]. Also, it was observed that the higher officials and organisations have actively tweeted from their personal twitter handles which might have influenced the reach of the tweets. The constituents and content of a tweet have a significant impact on the amplification of the posts. The current study used a combination of twitter post ranging from time links, polls, photos and video which also might has increased the impressions and engagements over period of time. In a recent study, the inclusion of a URL was recognised as the most critical component of successful tweeting, which could be analysed in the current study [58].

However, the results of current study are to be interpreted with caution considering few limitations. First, we took only twitter as social media platform to access the impact of the intervention. Further, the time duration of intervention was less which may undermine the effect of the intervention. In addition, the content obtained were too less for adequately powered analysis. The in-depth twitter analytics could not be examined for quantifying the number of individuals and their respective characteristics who watched the tweets. We have also not considered the posts retweeted by other handles and could not showcase the improved health outcomes.

Conclusion

The integrated media intervention in the study is first of its kind where twitter was used to extend outreach of hypertension services. The model focused upon context-specific twitter messages highlighting hypertension to diverse stakeholders. Online engagement and interactions have increased during the study period indicating potential of twitter in widespread dissemination of messages pertaining to hypertension and other public health issues for awareness and advocacy.

Acknowledgment

The authors would like to acknowledge and thank Global Health Advocacy Incubator (GHAI), USA for supporting the study and providing technical expertise in writing the manuscript.

References

1. WHO (2010) Global status report on noncommunicable diseases 2010. Organ 176.
2. Mills KT, Stefanescu A, He J (2020) The global epidemiology of hypertension. Nat Rev Nephrol 16: 223-237.
3. Hansen HH (1990). Epidemiology and Aetiology. Lung Cancer. 81: 15-22.
4. Princewel F, Cumber SN, Kimbi JA, Nkfusai CN, Keka EI, et al. (2019) Prevalence and risk factors associated with hypertension among adults in a rural setting: The case of Ombe, Cameroon. Pan Afr Med J 34.
5. Kearney PM, Whelton M, Reynolds K, Muntner P, Whelton PK, et al. (2005) Global burden of hypertension: Analysis of worldwide data. Lancet 365: 217-223.
6. Institute for Health Metrics and Evaluation (IHME) (2020) The Lancet: Latest global disease estimates reveal perfect storm of rising chronic diseases and public health failures fuelling COVID-19 pandemic.
7. World Health Organization (2020) Hypertension.
8. S. Harikrishnan (2014) The challenge of cardiovascular disease in developing economies.
9. (2005) Burden of chronic diseases: The rising tide.
10. Sharma M, Ganguly NK (2005) Premature coronary artery disease in Indians and its associated risk factors. Vasc Health Risk Manag 1: 217-225.
11. Long X, Qi L, Ou Z, Zu X, Cao Z, et al. (2017) Evolving use of social media among Chinese urologists: Opportunity or challenge? PloS One 12: e0181895.
12. Vedel I, Ramaprasad J, Lapointe L (2020) Social media strategies for health promotion by non-profit organizations: Multiple case study design. J Med Internet Res 22: e15586.
13. Campbell L, Evans Y, Pumper M, Moreno MA (2016) Social media use by physicians: A qualitative study of the new frontier of medicine. BMC Med Inform Decis Mak 16: 1-11.
14. Parmar N, Dong L, Eisingerich AB (2018) Connecting with your dentist on facebook: Patients' and dentists' attitudes towards social media usage in dentistry. J Med Internet Res 20: e10109.
15. Dumas AA, Lapointe A, Desroches S (2018) Users, uses, and effects of social media in dietetic practice: Scoping review of the quantitative and qualitative evidence. J Med Internet Res 20: e9230.
16. Kumar M, Mondal A (2018) A study on Internet addiction and its relation to psychopathology and self-esteem among college students. Ind Psychiatry J 27: 61.
17. (2020) Internet usage in India: Statistics and facts. Statista.
18. (2020) Digital Trends 2019 & Social Media Landscape in India. Sannam S4.
19. Al Mamun M, Ibrahim HM, Turin TC (2015) Social media in communicating health information: An analysis of facebook groups related to hypertension. Prev Chronic Dis 12.
20. Hawn C (2009) Take two aspirin and tweet me in the morning: How Twitter, Facebook, and other social media are reshaping health care. Health Affairs 28: 361-368.
21. Yasmin Ahmed (2020) Facebook struggles with high traffic as world sits at home and takes to social media because of Covid-19: Technology News. India Today.
22. Okwodu J (2020) 'We Need Joy to Survive': Naomi Shimada on How to Mindfully Use Social Media in the Age of Social Distancing. Vogue.
23. Cinelli M, Quattrociocchi W, Galeazzi A, Valensise CM, Brugnoli E, et

al. (2020) The COVID-19 social media infodemic. Sci Rep 10: 1-10.

24. Cornwell EY, Waite LJ (2012) Social network resources and management of hypertension. J Health Soc Behav 53: 215-231.
25. Petrella RJ, Speechley M, Kleinstiver PW, Ruddy T (2005) Impact of a social marketing media campaign on public awareness of hypertension. Am J Hypertens 18: 270-275.
26. Logan AG (2014) Community hypertension programs in the age of mobile technology and social media. Am J Hypertens 27: 1033-1035.
27. Kear T, Harrington M, Bhattacharya A (2015) Partnering with patients using social media to develop a hypertension management instrument. J Am Soc Hypertens 9: 725-734.
28. Liang H, Fung ICH, Tse ZTH, Yin J, Chan CH, et al. (2019) How did Ebola information spread on twitter: Broadcasting or viral spreading? BMC Public Health 19: 1-11.
29. Jain VK, Kumar S (2015) An effective approach to track levels of influenza-A (H1N1) pandemic in India using twitter. Procedia Comput Sci 70: 801-807.
30. (2020) Postgraduate Institute of Medical Education & Research (PGIMER), Chandigarh.
31. (2020) Indian states by GDP. Ministry of Statistics and Programme Implementation.
32. (2017) National Family Health Survey (NFHS-4) 2015-16 INDIA 2017.
33. (2021) In Punjab, over 70% people access internet on phone. The Tribune India.
34. Abbas S, Singh AK (2014) Media industry trends and dynamics: The social media boom. Procedia Soc Behav Sci 155: 147-152.
35. Goel S, Jaswal N, Sharma S, Gill SS, Gupta R, et al. (2021) Development of integrated model of communication for implementing media strategy to prevent hypertension in a northern state of India. J Hypertens 39: 1333-1340.
36. Denis McQuail (1983) McQuail's Mass Communication Theory. (6th edn) SAGE.
37. Xie Q, Neill MS, Schauster E (2018) Paid, earned, shared and owned media from the perspective of advertising and public relations agencies: Comparing China and the United States. Int J Strateg Commun 12: 160-179.
38. Tripathy JP, Thakur JS, Jeet G, Chawla S, Jain S (2017) Alarmingly high prevalence of hypertension and pre-hypertension in North India-results from a large cross-sectional STEPS survey. PloS One 12: e0188619.
39. Wolfs B, Hermans N, Peeters M, Megens C (2013) Social stairs: A case study for experiential design landscapes. Research Gate.
40. Wakefield MA, Loken B, Hornik RC (2010) Use of mass media campaigns to change health behaviour. Lancet 376: 1261-1271.
41. Nelson O (2011) Mass media strategies for creating awareness of breast cancer. Research Gate.
42. Wentzel-Viljoen E, Steyn K, Lombard C, De Villiers A, Charlton K, et al. (2017) Evaluation of a mass-media campaign to increase the awareness of the need to reduce discretionary salt use in the South African population. Nutrients 9: 1238.
43. Evans A, Twomey J, Talan S (2011) Twitter as a public relations tool. Research Gate.
44. Guo C, Saxton GD (2014) Tweeting social change: How social media are changing nonprofit advocacy. Nonprofit and voluntary sector quarterly 43: 57-79.
45. Frame A, Brachotte G (2015) Le tweet stratégique: Use of Twitter as a PR tool by French politicians. Public Relat Rev 41: 278-287.
46. Pershad Y, Hangge PT, Albadawi H, Oklu R (2018) Social medicine: Twitter in healthcare. J Clin Med 7: 121.
47. Ventola CL (2014) Social media and health care professionals: Benefits, risks, and best practices. Pharm Ther 39: 491.
48. Malik A, Heyman-Schrum C, Johri A (2019) Use of Twitter across educational settings: A review of the literature. Int J Educ Technol High Educ 16: 1-22.
49. Yang Q, Tufts C, Ungar L, Guntuku S, Merchant R (2018) To retweet or not to retweet: Understanding what features of cardiovascular tweets influence their retransmission. J Health Commun 23: 1026-1035.
50. Massey PM, Leader A, Yom-Tov E, Budenz A, Fisher K, et al. (2016) Applying multiple data collection tools to quantify human papillomavirus vaccine communication on Twitter. J Med Internet Res 18: e318.
51. Zhou S, Zhao Y, Rizvi R, Bian J, Haynos AF, et al. (2019) Analysis of Twitter to identify topics related to eating disorder symptoms. In 2019 IEEE International Conference on Healthcare Informatics (ICHI) 1-4.
52. Tufts C, Polsky D, Volpp KG, Groeneveld PW, Ungar L, et al. (2018) Characterizing tweet volume and content about common health conditions across Pennsylvania: Retrospective analysis. JMIR Public Health Surveill 4: e10834.
53. Mishori R, Singh L, Lin KW, Wei Y (2019) Diversity: Conversations on Twitter about women and Black men in medicine. J Am Board Fam Med 32: 28-36.
54. Leary M, McGovern S, Dainty KN, Doshi AA, Blewer AL, et al. (2018) Examining the use of a social media campaign to increase engagement for the American Heart Association 2017 Resuscitation Science Symposium. J Am Heart Assoc 7: e008710.
55. Sternberg KM, Loeb SL, Canes D, Donnelly L, Tsai MH (2018) The use of Twitter to facilitate sharing of clinical expertise in urology. J Am Med Inform Assoc 25: 183-186.
56. Conley CC, Goyal NG, Brown SA (2020) CardioOncology: Twitter chat as a mechanism for increasing awareness of heart health for cancer patients. Cardio-Oncology 6: 1-5.
57. Da BL, Surana P, Schueler SA, Jalaly NY, Kamal N, et al. (2019) Twitter as a noninvasive bio-marker for trends in liver disease. Hepatol Commun 3: 1271-1280.
58. Bruni L, Francalanci C, Giacomazzi P (2012) The role of multimedia content in determining the virality of social media information. Information 3: 278-289.