



Exploration of online hashtag drives related to non-communicable diseases in social media platforms

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ABSTRACT

Background

Social media is used extensively to disseminate major public health communications. Hashtags (#) are used in social media to share content and can enable content to reach millions. The health sector uses popular hashtags as a medium for promulgating health-related campaigns. As non-communicable diseases (NCDs) are increasing, this study analyzed the use of hashtags including #diabetes_mellitus, #hypertension and #Coronary_artery_disease in the dissemination of health communication messages, in order to assess hashtag campaigns related to non-communicable diseases in social media. The study compared three different campaigns across three different platforms: Twitter, Instagram and Facebook.

Methods

We used a cross-sectional study to analyze the contents of the three health campaigns across the three platforms. Publicly accessible posts were searched across the three platforms and assessed separately. The nature of the post, its authenticity, language, acceptance/reach, the intention behind the post and validation/substantiation of the post were assessed within each campaign and compared between the three.

Results

Out of 897 analyzed posts across all three platforms, 244 (27%) were related to NCDs and 653 (73%) were not related. Of the related posts, 88 (30%) were from Facebook and the same proportion from Instagram. Twitter had 68 (22%) related posts. On Twitter, 67 (98.5%) of the related posts were assessed as credible, as were 85 (96.5%) of the posts on Facebook, but the same was true of only 52 (59%) of the posts on Instagram.

Conclusion

Plain hashtag drives shared on Twitter and Facebook were mostly (>95%) credible, but the percentage on Instagram was lower (59%). A small majority of the posts were created for awareness purposes rather than advertising (54%:46%). Social media can be an excellent means of disseminating health-related information and of generating better health behaviour, but some platforms may be more effective and appropriate than others.

Keywords: Non-communicable diseases, social media, hashtag drives, health behaviour

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INTRODUCTION

Social Media has gained immense popularity in the past 10 years. By the start of 2022, monthly worldwide active users of just two major social media platforms, Facebook and Twitter, had reached 2.20 billion and 336 million, respectively. Studies have reported several uses of social media by healthcare providers, such as dissemination of health information, monitoring of disease pandemics, health promotion and social media-based health interventions.¹ Online health-seeking behaviour has increased immensely: one study, conducted in the UK, found that it increased from 18% in 2008 to 43% in 2013.² This trajectory has continued in the decade since.

A hashtag (#) is a social media feature that denotes a specific category or topic and helps in streamlining the wealth of information associated with that topic. The creation and adoption of disease-specific hashtags by healthcare stakeholders has led to a greater uniformity of medical discussions that can be retrieved and referenced at later time-points.³ Hashtags are used in the social media to share contents and to reach out to millions.

Many people contribute health-related information to social media, without necessarily considering the integrity of the information.⁴ This has led to a situation the World Health Organization has described as an “infodemic” in which there is so much information that it can be difficult to navigate, and may include false or misleading information in digital and physical environments during disease outbreaks, which can be hard for users to assess. There is growing concern that infodemics could result in the public taking up habits that could be harmful to their health.⁵

Using social media for health promotion, through targeted messages, including the ability to interact with the public, to target hard-to-reach groups, and to create snowballing of health-related messages amongst the public has become very common.⁶⁻¹⁰ Online social networks could have an important influence on health behaviours and outcomes. However, public health agencies have not yet harnessed the full potential of social media: often,

social media has been used only to disseminate information without much concern given to how those receiving the messages can assess their reliability and/or credibility. Information is often a one-way communication rather than an ongoing discussion in which doubts or anxiousness related to the campaigns can be discussed or messages elaborated on with further information.¹¹ Nonetheless, online campaigns such as the Australian ‘slip, slap slop’ for skin cancer have been known to reach large audiences and have seen success in the past.¹²

Resources and data regarding non-communicable diseases (NCDs) on social media platforms in middle- and low-income countries is scarce. Information regarding diabetes and hypertension, for example, is rare, and symptoms of these conditions are often neglected. Even though they are very common and easily manageable, many deaths are reported due to complications that could be avoided. Social media and hashtag campaigns on NCDs have a potential role in prevention and management of such conditions, including patient health education and information sharing, psychological support, self-management, public health campaigns and capacity-building for health professionals. People do take time to read health messages received through social media and some contemplate change based on these health messages. For this reason, it is vital for health messages to be credible and authentic.¹³

In many developing countries, NCDs and chronic diseases (diseases in which symptoms continue for longer than three months and may come and go) are rising rapidly. Hashtag campaigns have an extensive reach and the potential to influence target audiences towards healthy behavioural changes.¹⁴ Social media provides knowledge, social support and engagement for patients with chronic diseases and NCDs and can help patients in managing and coping with these conditions.¹⁵

At the Third United Nations General Assembly High-level Meeting, held in the late September 2018, the hashtag #beatNCDs (Non-Communicable Diseases,

such as cancer, diabetes, and cardiovascular disease) was claimed for NCDs control and prevention,¹⁶ as evidence had shown that several hashtag campaigns have been a success including, #hereforyou (for removing stigma regarding mental health), #loveyourcervix (to point out importance of cervical screening),¹⁷ #letstalk (for World Health Day 2017), Hands Up for #HIV prevention, and #notobacco (for World Tobacco Day 2017).⁴

This study aimed to analyze the characteristics of messages linked to three hashtags for NCDs: #diabetes_mellitus, #hypertension and #Coronary_artery_disease in three social media platforms: Instagram, Twitter and Facebook, and to compare the quality of information between three different platforms.

METHODS AND MATERIALS

We conducted a cross-sectional study for one month, from April to May 2019. We identified 300 posts from three hashtag drives, with a minimum of 100 posts from each platform (Facebook, Twitter, and Instagram), targeting 900 samples.

Using the hashtags #diabetes_mellitus, #hypertension and #Coronary_artery_disease, recent

posts were searched in Instagram, Twitter and Facebook and were assessed for the following:

- 1) Nature of the post: image or video, and whether the content was shared by an individual or an organization;
- 2) Authenticity: whether the information aligned with information provided in a standard textbook, journal article or scientifically verified source;
- 3) Language: English or Tamil;
- 4) Popularity: a post was assessed as popular if it had received more than 50 likes;⁴
- 5) Credibility: whether the information in the post was considered to be true;⁴
- 6) Background of the post: whether the main purpose was deemed to be advertisement or awareness; and
- 7) Validation/substantiation of the post: did the post originate from a verified source, assessed by identifying the blue tick mark at the end of the source name.

Data were entered into Microsoft Excel and analyzed using Epi info for frequencies and percentages.

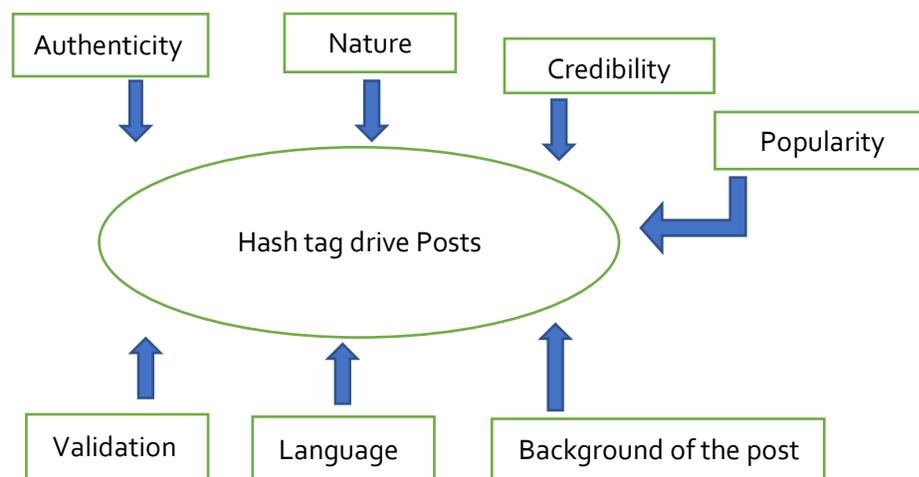


Fig 1: Characteristics of the posts analyzed

RESULTS

We aimed to collect 100 posts from each platform (Facebook, Twitter, and Instagram) for each of the three campaigns (diabetes, hypertension and coronary artery disease) and managed to collect 897 samples: 101 posts for all 3 hashtags in Twitter and 99 posts for Instagram and Facebook (Fig 2) of which 244 (27%) were related to the campaigns and 653 (73%) were not related (Fig 3). Of the 244 related posts, 88 (36%) were from Facebook, 88 (36%) were from Instagram and 68 were (28%) from Twitter.

Of the 88 related posts from Facebook, 52 (59%) were photographs and 35 (40%) were video posts; 87 (99%) were in English and 1 (1%) was in Tamil; 85 (97%) posts were credible and 50 (57%) posts were popular; 58 (66%) posts were from a verified source. Just over half of the posts, 50 (57%), were created for awareness while 38 (43%) were created for advertisement purposes. (Table 1, following page).

Of the 88 related posts from Instagram, 50 (57%) were photographs and 87 (99%) were in English; 52 (59%) posts were assessed as credible and 50 (57%) were popular; 56 (64%) were from an authenticated source. 61 (69%) Instagram posts were created for awareness; the rest were advertisements. (Table 1, following page).

Of the 68 related posts on Twitter, 47 (69%) were photographs and 19 (28%) were videos. Most of the posts – 66 (97%) – were in the English language, 67 (98.5%) posts were assessed as credible according to the criteria described in the methodology and 42 (62%) were found to be popular, with more than 50 likes. Just over half – 37 (54%) – were posted by a verified source and 47 (69%) posts were created for advertisement purposes. (Table 1, following page).

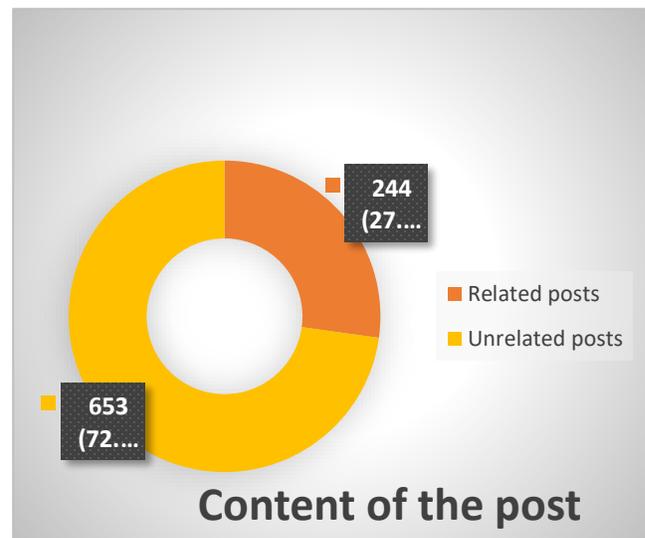


Fig 3: Relatedness of the posts to NCDs (n=897)

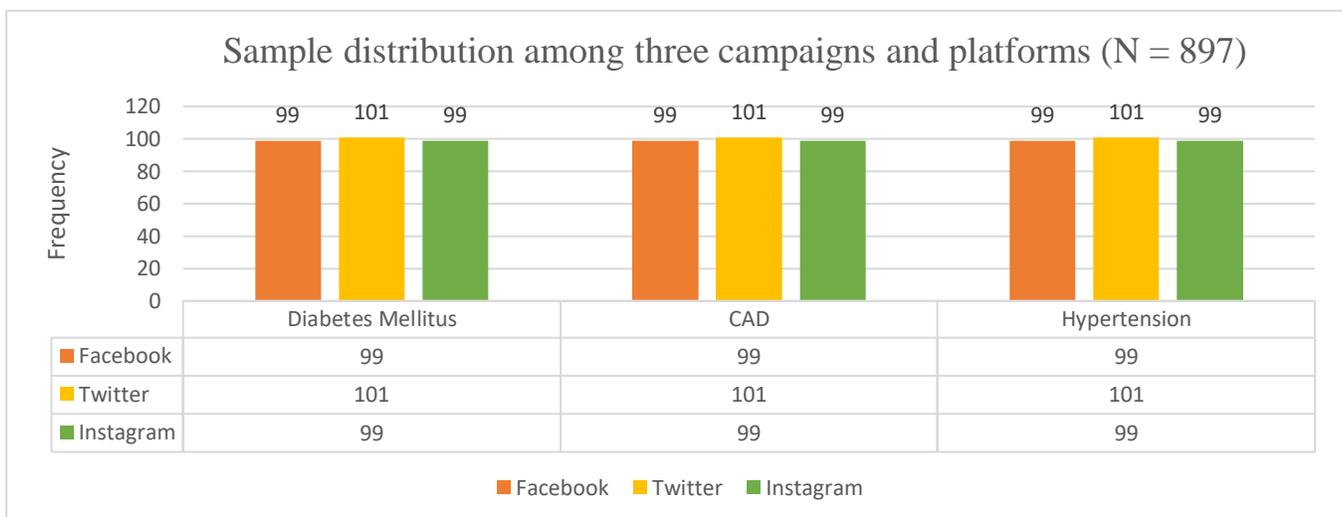


Fig 2 Sample distribution among three campaigns and platforms (n=897)

Table 1: Characteristics of the posts specific to each social media platform

Variables	Facebook n=297(%)	Twitter n=303 (%)	Instagram n=297(%)	Total
Content of the post	297(33)	303(34)	297(33)	897(100)
Related	88(30)	68(22)	88(30)	244(27)
Unrelated	209(70)	235(78)	209(70)	653(73)
Type of post	n=88(%)	n=68(%)	n=88(%)	N=244(%)
Photograph	52(59)	47(69)	50(57)	149 (61)
Video	35(40)	36(41)	36(41)	90 (37)
Words/links	1(1)	2(3)	2(2)	5 (2)
Language of the post	n=88(%)	n=68(%)	n=88(%)	N=244(%)
English	87(99)	66 (97)	87(99)	240 (98)
Tamil	1 (1)	2 (3)	1 (1)	4 (2)
Credibility of the post	n=88(%)	n=68(%)	n=88(%)	N=244(%)
Yes	85(97)	67(99)	52(59)	204 (85)
No	3(3)	1(1)	36(41)	40 (16)
Popularity of the post	n=88(%)	n=68(%)	n=88(%)	N=244(%)
Yes	50 (57)	42 (61)	50 (57)	142 (58)
No	38 (43)	26 (38)	38(43)	102 (42)
Authenticity of the post	n=88(%)	n=68(%)	n=88(%)	N=244(%)
Yes	58 (66)	37 (54)	56 (64)	151 (62)
No	30 (34)	31 (46)	32 (36)	93(38)
Background of the post	n=88(%)	n=68(%)	n=88(%)	N=244(%)
Awareness	50 (57)	21 (31)	61 (69)	132 (54)
Advertisement	38 (43)	47 (69)	27 (31)	112 (46)

DISCUSSION

In our study, the plain hashtags #diabetes_mellitus, #hypertension and #Coronary_artery_disease were analyzed across Twitter, Instagram and Facebook. Direct comparisons of the three platforms could not be carried out as intended, as the topics and the characteristics of the posts differed too extensively. A

similar study conducted on the patterns and characteristics of posts related to selected health issues (#dengue, #dengue virus, #zika and #zika virus) on Facebook, Twitter and Instagram, showed that Facebook posts were more likely to achieve high popularity, which was different from our study in

which popularity across the three platforms was broadly similar (57% on Facebook and Instagram, 61% on Twitter, not statistically significant) and were more likely to be from verified accounts, which was true of Facebook and Twitter in our study, but not for Instagram (66%, 64% and 54% authenticity for Facebook, Twitter and Instagram respectively).¹⁸ In our study, 244 (27%) of posts using the hashtags were related to the NCDs but 653 (73%) were not, indicating that a lot of unrelated information (neither advertisement nor awareness) regarding NCDs was being circulated around in plain hashtag drives. This may be because the diseases are very common and everyone shares their own experiences of them.

In our study, Twitter had a higher percentage of photograph posts with these hashtags than the other two social media platforms (69% for Twitter, 59% for Facebook and 57% for Instagram). Photographs get more engagement than videos or texts/links¹⁹ but the reasons for the different distributions was not explored within our study. Virtually all the posts were in English across all three social media platforms (99% on Facebook and Instagram, and 97% on Twitter) with very few posts in the local Tamil language. Twitter had more credible posts than Facebook and Instagram (99%, 97% and 59%) compared to the findings of Britto et al, where Facebook had more credible posts.¹⁸ Popularity of the posts was found to be similar in Facebook and Instagram in our study (both 57%) and higher on Twitter (61%), which may be due to the popularity of the respective platforms.^{20,21,22} Posts were more likely to be from verified sources on Facebook (66%; 54% on Twitter and 64% on Instagram). Instagram had the highest ratio of

awareness posts to advertisements (7:3) and Twitter had the highest ratio of advertisement posts to awareness ones (3:7); Facebook had a ratio of 6:4 in favour of awareness posts. In our study, overall, 204 out of the related posts (84%) were assessed to be credible, which may be because most of the posts were from verified sources, which is one of the key criteria for information credibility (message credibility, source credibility, media credibility).²³

CONCLUSION

Out of the 897 hashtag posts, only 244 posts were directly related to NCDs. Facebook and Instagram had an equal share of related posts and Facebook posts were more popular than Twitter posts. Most of the posts were in English and the majority were credible. The platform most likely to be credible was Twitter (99%) and the one least likely to be credible was Instagram (59%).

Posts in all three social media platforms were mostly photographs with a minority of texts and links, and more posts were generated to create awareness than advertising. This suggests that despite widespread criticism and interest in the negative aspects of infodemics⁵, social media is an excellent means to disseminate health-related information and thereby generate improved health behaviour.

Not all popular social media platforms were assessed in this study; others such as YouTube, WhatsApp and Reddit were not considered. Personal decisions may have affected the interpretation of the results. Only Tamil and English language posts were included in this study.

REFERENCES

1. U.S Census Bureau and United Nations. Global Web Index. Available from: <http://www.globalwebindex.net/>. [Last accessed on 2017 Nov 21].
2. Cole J, Watkins C, Kleine D Health Advice from Internet Discussion Forums: How Bad Is Dangerous? *J Med Internet Res* 2016;18(1): e4
3. Naveen Pemmaraju, Michael A. Thompson, Muzaffar Qazilbash. Disease-specific hashtags and the creation of Twitter medical communities in hematology and oncology, *Seminars in Hematology* 2017, 54(4), 189-192
4. George N, Britto DR, Krishnan V, Dass LM, Prasant HA, Aravindhan V. Assessment of hashtag (#) campaigns aimed at health awareness in social media. *J Edu Health Promot* 2018; 7:114.
5. https://www.who.int/health-topics/infodemic#tab=tab_1 last accessed on 6/4/22

6. George D, Rovniak L, Kraschnewski J. Dangers and opportunities for social media in medicine. *Clin Obstet Gynecol* 2013;56(3).
7. Neiger B, Thackery R, Burton S, Giraud-Carrier C, Fagen M. Evaluating social media's capacity to develop engaged audiences in health promotion settings: use of Twitter metrics as a case study. *Health Promot Pract* 2013;14(2):157-162.
8. Griffiths F, Lindenmeyer A, Powell J, Lowe P, Thorogood M. Why are health care interventions delivered over the internet? A systematic review of the published literature. *J Med Internet Res* 2006 Jun 23;8(2): e10
9. Thackeray R, Neiger B, Hanson C, McKenzie J. Enhancing promotional strategies within social marketing programs: use of Web 2.0 social media. *Health Promot Pract* 2008 Oct;9(4):338-343
10. Korda H, Itani Z. Harnessing social media for health promotion and behaviour change. *Health Promot Pract* 2013 Jan;14(1):15-23.
11. Heldman A, Schindelar J, Weaver IJ. Social media engagement and public health communication: implications for public health organizations being truly "social". *Public Health Rev* 2013;35(1):1.
12. Gough A, Hunter RF, Ajao O, Jurek A, McKeown G, Hong J, Barrett E, Ferguson M, McElwee G, McCarthy M, Kee F. Tweet for Behaviour Change: Using social media for the Dissemination of Public Health Messages *JMIR Public Health Surveill* 2017;3(1): e14.
13. Islam S, Tabassum R, Liu Y, Chow C et al. The role of social media in preventing and managing non-communicable diseases in low-and-middle income countries: Hope or Hype? *Health Policy and Technology* Jan 2019 8(1):1-3.
14. Fung IC, Blankenship EB, Goff ME, Mullican LA, Chan KC, Saroha N, et al. Zika-virus-related photo sharing on Pinterest and Instagram. *Disaster Med Public Health Prep* 2017; 11:656-9.
15. Purva Grovera, Arpan Kumar Kara, Gareth Davies. "Technology enabled Health" – Insights from twitter analytics with a sociotechnical perspective. *International Journal of Information Management* 43 (2018) 85–97.
16. TASCÁ, Tiago; FREITAS, Roberta de. Global health diplomacy as a process: the Chilean ultra-processed foods regulation case. *Revista Mundorama*, [Brasília], 24 out. 2019.
17. Butteris C. The World's Best Public Health School Campaigns. 2019 <https://www.bangthetable.com/blog/public-health-social-media-campaigns/> last accessed on 6/4/22.
18. Britto DR, George N, Prabhu R, Murali KJ, Nethaji V, Shree J. Hashtag usage and its pattern on selected health problems in social media. *Int J Med Sci Public Health* 2018; 7:203-8.
19. Social timing infographics from Dan Zarella, KISSmetrics, Bit-ly and Argylt Social. <https://www.blog.bufferapp.com/best-time-to-tweet-post-to-Facebook-send-emails-publish-blogspots>. Last accessed on 4/4/2022
20. Leading Countries based on Facebook audience size as on January 2022. 2022. <https://www.statista.com/statistics/268136/facebook>. Last accessed on 5/4/2022,
21. Distribution of Instagram users worldwide as of January 2022 by age group. 2022. <https://www.statista.com/statistics/325587/instagram-global-age-group/>. Last accessed on 5/4/2022.
22. Leading countries based on Twitter users by January 2022. 2022. <https://www.statista.com/statistics/242606/number-of-active-twitter-users/>. Last accessed on 5/5/2022.
23. Metzger MJ, Flanagin AJ, Eyal K, Lemus DR, McCann RM. Credibility for 21st century: Integrating perspectives on source, message and media credibility in the contemporary media environment. *Ann Int Commun Assoc.* 2003;27: 293-335.