

# Cervical Cancer Prevention on Instagram: Content and Social Interaction Analysis of Brazilian Accounts

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## Abstract

**Objective:** The aim of the present study was to analyse the content of posts on Instagram about cervical cancer. **Methods:** It was conducted a qualitative analysis using the 50 most popular publicly available Portuguese-language Instagram posts, containing the hashtags #cervicalcancer, #papsmear, #hpv, #papillomavirus, and #hpvvac-cine, during the Brazilian national cervical cancer prevention campaign in March 2018. **Results:** Posts recruited using #cervicalcancer provided 60% of posts with contents related to secondary prevention; the #papsmear provided 46% of posts with irrelevant contents; the #hpv and #papillomavirus provided 50% and 64% of posts with informative content, respectively; and the #hpvaccine provided 58% of posts with content related to primary prevention. The posts that received the highest number of likes were those from the hashtags #hpv and #papillomavirus with 151.33 and 78.00 likes/post, respectively. The majority of posts presented less than 05 comments/post, except for the #hpv, which had 64.76 comments/post. According to the users' profiles, the majority of the posts, regardless of the hashtag used, were made by health professionals. **Conclusion:** The focus of Instagram posts about cervical cancer is on secondary prevention, which can contribute to the promotion of health behaviours not directed to aspects of primary prevention of the disease.

**Keywords:** Health promotion- mHealth- chronic non-communicable diseases

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## Introduction

Cervical cancer is a serious public health problem worldwide, especially in Latin America and the Caribbean. It represents the third most prevalent type of malignancy in women and the fourth leading cause of cancer mortality in this population [1]. Over the past decade, the incidence, mortality, and morbidity of cervical cancer have been reduced in some high-income countries [2]. The results in low- and middle-income countries, have shown to be inconsistent in response to limited strategies for disease control [3, 4].

The main causative agent of cervical cancer is the human papillomavirus (HPV) types 16 and 18 [5]. Many countries have implemented screening strategies for pre-malignant lesions, as well as the HPV test and its vaccine, in an organized way as the main control

strategies for cervical cancer [6, 7]. In March 2014, Brazil implemented free vaccination of the quadrivalent HPV vaccine for women aged 9–13 years which was expanded in 2017 to women aged 9–14 years, men aged 11–14 years, and women and men aged 9–26 years living with HIV/AIDS or immunodeficiency [8]. Consequently, throughout March, a national campaign to control cervical cancer, known as March Lilac, was launched in Brazil.

Even after the implementation of this campaign, the incidence of cervical cancer among the female population remains high in the country, especially among young women [9-11]. The limitations of access to prevention programs, especially HPV vaccination, have been suggested as a preponderant factor for the configuration of this epidemiological scenario [12, 13]. Difficulties in

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accessing health services, fear of adverse reactions to the vaccine, and lack of knowledge of the relationship between HPV and cervical cancer are the main reasons for low adherence to the vaccine campaign [14-16].

As it is gynecological cancer, many taboos and cultural aspects emerge from discussions about the management of cervical cancer. The spread of fake news and misinformation, especially through social media platforms, harms health decision-making [17, 18] as in the case of the HPV vaccine [19]. Misinformation shared on these platforms has led many parents to believe that the HPV vaccine would stimulate their child's early sexual activity or even be subjecting them to risks of severe side effects [20]. Thus, the successful implementation of health education strategies based on the use of social media depends on the quality of the information disseminated [21, 22]. Some studies have reported the presence of posts contrary to the HPV vaccine [23, 24] on Instagram, one of the most popular social media platforms among youngsters [25]. This highlights the need for studies focusing on the analysis of posts related to cervical cancer prevention on online social networks.

To the best of our knowledge, few studies have evaluated health-related posts on Instagram focusing on cervical cancer. Of those, more attention was paid to the HPV vaccine rather than other cervical cancer prevention issues. Thus, we present data showing how the main hashtags on the topic of cervical cancer direct and streamline health-related content on Instagram during the Brazilian campaign for cervical cancer prevention.

## Materials and Methods

This is a descriptive study that used a qualitative method to analyse the content of posts retrieved by hashtags (#) related to the topic of cervical cancer prevention on Instagram ([www.instagram.com](http://www.instagram.com); Facebook, Menlo Park, CA) in Brazilian Portuguese-language accounts. This study adhered to Instagram's terms and conditions of use and privacy policy. The research protocol was exempt from ethical review since all data were publicly available and the researchers did not interact with the users. All data collected had no identifying information to guarantee the anonymity of the participants and prevent the misuse of information.

The posts were collected manually from screenshots directly from Instagram (website version) by a researcher using an anonymous account. As posts on the Instagram Platform are indexed by #, the search for posts was directed through keywords that are linked to the topic of cervical cancer. In addition, as the Instagram platform has a specific filter to search for the most popular posts, the filter of the 50 most popular posts was used to analyze only the content of the most popular posts among instagramers. So, the 50 most relevant posts were retrieved using the following hashtags in the search area: #cervicalcancer, #papsmear, #HPV, #papillomavirus, and #hpvvaccine. These hashtags were selected because they represent terms commonly described in protocols for early detection and prevention of cervical cancer [26, 27]. Data were collected

on the last day of March in 2018, a period representing the awareness campaign on cervical cancer prevention in Brazil, known as March Lilac. In this way, the 50 most popular posts on the topic were posted throughout the campaign period. Each post was encoded and stored in folders named after the hashtags used in the screening.

The posts content analysis was performed using inductive and deductive classification methods [28]. Posts were characterized according to 1) media's resources (image with or without text, photo, video); 2) post content (primary prevention, secondary prevention, informational, and irrelevant); 3) interaction tags (likes, comments, and views); and 4) self-declared description of the users' accounts (health professionals, not health professionals).

The content analysis of the posts was carried out following the recent recommendations of scientific literature regarding the prevention and management of cervical cancer [29]. Therefore, it was considered that the contents related to primary prevention dealt with actions taken to remove causes and risk factors for cervical cancer (e.g., HPV immunization, physical activity guidance, healthy eating, smoking, use of condoms, etc.). Secondary prevention measures, on the other hand, dealt with actions taken for the early detection of cervical cancer (e.g., screening for precursor lesions with a Pap smear, HPV test). Contents classified as informative indicated or notified about specific dates regarding cervical cancer control campaigns. Those classified as "irrelevant" dealt with aspects other than cervical cancer prevention, usually with spurious associations.

The data were analyzed by two independent researchers who classified all posts. The analyses were compared between the researchers and those that showed discrepancies were analyzed by a third researcher. The discrepancies between the two analyzes were minimal, thus, the analysis of only one of the researchers was considered.

## Results

### Content analysis

Table 1 shows data regarding the media resource type. Images with text were the most frequent types of media resources in posts, corresponding to 76% of the total on the #cervicalcancer, 72% on the #papsmear, 68% on the #hpvvaccine, and 56% on the #papillomavirus. For #hpv, videos represented the most frequent type of resource (58%).

Data related to the post content are presented in Table 2. For the #cervicalcancer, the majority of posts (60%) addressed content related to secondary prevention; 46% of #papsmear addressed irrelevant content; 50% of #hpv and 64% of #papillomavirus addressed informative content; while 58% of #hpvvaccine addressed content related to primary prevention. Representation of posts with different content approaches is shown in Figure 1.

### Social interaction analysis

Table 3 shows data regarding the posts' interaction. The posts that received the highest number of likes were

Table 1. Media's Resource Profile

	Image without text	Image with text	Photograph	Video
#cervicalcancer	-	38	10	2
#papsmear	4	36	6	4
#hpv	-	20	1	29
#papillomavirus	1	28	16	5
#hpvvaccine	-	34	10	6

Table 2. Post's content Profile

	Primary prevention	Secondary prevention	Informative	Irrelevant
#cervicalcancer	-	30	10	10
#papsmear	-	14	13	23
#hpv	10	6	25	9
#papillomavirus	4	3	32	11
#hpvvaccine	29	6	15	-

Table 3. Post's interaction Profile

	Likes/post	Comments/post	views/video
#cervicalcancer	41,79	1,16	20
#papsmear	53,26	3,85	1.171
#hpv	151,33	64,76	8.829
#papillomavirus	78,00	5,35	575
#hpvvaccine	52,97	1,52	213

those from #hpv and #papillomavirus with 151.33 and 78.00 likes/post, respectively. For the comments, most of the posts presented less than 6 comments/post, except for #hpv, which had 64.76 comments/post. For the videos, the most viewed were those from #hpv (8.829 views/video) and #papsmear (1.171 views/video).

Data regarding the self-declared description of the users' accounts are shown in Table 4. Most of the posts were made by users who declared themselves to be health professionals. They accounted for 58% of the posts for #cervicalcancer, 74% for #papsmear, 70% for #hpv, 84% for #papillomavirus, and 94% for #hpvvaccine.

## Discussion

The present study seeks to contribute into the scientific literature presenting how the main cervical cancer-related hashtags leads to relevant informational post on Instagram, in order to analyze the effectiveness and safety of social media as a health education's ally. In summary, the main findings, showed that informational content regarding cervical cancer has spread among Brazilian Instagram

accounts by profiles linked to the health area. However, at least in the way it was conducted, it has not reached high popularity and the content shared poorly addressed primary prevention informational content.

To broaden the search for posts with more general information about the disease, we used hashtags with terms targeting both the prevention and early detection of cervical cancer. The data from this screening showed that the use of each specific hashtag shifted the focus of posts to pragmatic actions within the theme. The hashtags #hpv and #papillomavirus direct to informative content about dates and locations of vaccination campaigns, #hpvvaccine to primary prevention, and #cervicalcancer to secondary prevention. These data seem to be positive as the hashtags are targeting content related to them. Some studies focusing on other types of cancer pointed out that Instagram posts tend to focus on awareness and patient support rather than on concrete actions and behaviors [30, 31]. This tendency of the content of the posts to focus on issues of low relevance to promote more effective self-care behaviors, with attention to risk and protection factors, brings relevant limitations for the use of Instagram

Table 4. User's profile

	Health professionals	Non-Health Professionals
#cervicalcancer	29	21
#papsmear	37	13
#hpv	35	15
#papillomavirus	42	8
#hpvvaccine	47	3



Figure 1. Cervical Cancer Prevention-related Content on Instagram. Examples of post content including (a) Informative; (b) Primary prevention; (c) Secondary prevention; (d) Irrelevant content.

as an effective tool for health empowerment, suggesting the need for reassessment of its use for this purpose.

Health-related content usually does not receive attention from digital influencers because it is not attractive to young followers. To mitigate this effect, studies have suggested some alternatives. One of them is labeling commercially sponsored content on social media, as recently demonstrated for posts by e-cigarette influencers on Instagram [32], another is to take advantage of topics with greater media repercussions, such as the COVID-19 [33]. For diseases such as cervical cancer, what has really drawn the most attention is the HPV vaccine [24]. In this case, although posts with pro-vaccine content are more prevalent on Instagram, posts with anti-vaccine content have more engagement regardless of whether they are more or less reliable [21, 31]. Thus, the controversy regarding the HPV vaccine seems to hide or make it impossible to address other issues related to the disease, such as information on risk or protective factors as well as early detection matters. As the tendency of the publications analyzed in the present study was on the HPV vaccine, this corroborates the hypothesis that the choice of a controversial topic was the anchor of popularity.

Furthermore, the tendency of some hashtags, especially #hvp and #papelomavirus, to target content on alerts and reminders of vaccination campaigns draws attention to the quality of the posted content, with little effective value to promote useful learning for self-care in health. This finding was not surprising since the data were collected exactly at the end of March, a month dedicated to the national campaign for cervical cancer prevention in Brazil, showing that Instagram helped to publicize this campaign. Posts related to primary prevention issues other

than the HPV vaccine, such as physical activity guidance, healthy eating, smoking, use of condoms, and others, were posted incipiently, gaining little attention from Instagram accounts for these issues. In view of the growing increase in HPV vaccine hesitancy [34, 35], pro-vaccine actions are appropriate in this context; however, they should not be exclusive, and other issues also need to be highlighted.

The addressing of both cervical cancer risk factors and protective factors, as well as content about myths and stigmas of the disease, are mandatory for better engagement of women in health-educational strategies focusing on self-care practices related to cervical cancer prevention [36-38]. It seems that guaranteeing only informative content on Instagram underestimates the potential of this social network as a driver of behavioral changes based on improving knowledge about self-care in health. This signals the debate on improvements in the usability of this popular communication tool among Brazilian Instagram users.

Another issue analyzed in our study was the social interaction, for this, it was speculated how the choice of media type (image, photo, video) or the information content itself could influence the popularity of the posts. Results showed that the most used resource was images with text, except for posts sorted using #hvp where the preference was for videos. This finding may justify the little interaction of users with the posted content, suggesting once again limitations in the theme articulation by Brazilian Instagram accounts. This hypothesis has also been raised by others, showing that the use of more elaborate media resources is more attractive among young people, and for this reason, they have gained more attention [39-41].

In the case of Instagram, social influencers often let their viewers be part of their personal lives by sharing personal and intimate stories and images that reinforce the identification process and engagement, which may also lead to improvements in the popularity, [42- 44]. Results indicated that posts in the format of videos received a good number of views; however, as most of these videos were derived from the #hpv, their popularity cannot be attributed only to the resource format but also to the topic addressed or the information quality. Although we have not carried out an analysis of the quality of the information posted, we can infer based on the direction of the topics linked by the hashtags used that the controversy over the HPV vaccine has indeed favored the viewing of these videos.

Regardless of the relevance of the debate about the HPV vaccine, it cannot be ruled out that for chronic non-communicable diseases with a high potential of prevention, such as cervical cancer, health education strategies directed toward risky or protective behaviors are more suitable as recently reviewed [45]. It is also known that for effective learning in health, it is important that educational strategies support content favoring deliberation of ideas and the sharing of experiences [46,47]. The relevance of informational content dissemination, especially that aimed at alerting prevention campaigns as well as content on secondary prevention of the disease, cannot be underestimated.

However, it is expected that the focus of the content is in line with that proposed by health institutions. Thus, even though many health professionals used Instagram to disseminate information about cervical cancer during the March Lilac campaign, as presented herein, it may not have been so significant in driving behavioral changes aimed at more efficient cervical cancer prevention mechanisms. However, they served as alerts of attention to the topic. As previously demonstrated by others, Instagram has been used by health professionals to deliver information on health for different diseases, and as reported here, the approaches were superficial [48-50]. Regardless of the course of discussions, the participation of health professionals in health education strategies might be necessary for guaranteeing information content quality and the focus of the debate.

Studies suggest that the presence of health professionals supervising the flow of information through social networks may contribute to reducing the risk of spreading false news and improving the efficiency of the educational strategy [51,52]. In a recent study by our research group, findings indicated that online discussion groups (WhatsApp groups) are most effective in improving learning about disease prevention (breast cancer) when informational content is articulated by an experienced moderator [53]. Regardless of the type of social media platform used, the presence of a health professional to mediate discussions in a precise and harmonious way can be decisive for the success of online health education actions.

Although an analysis of the content of the comments was not carried out in the present study to validate whether the topic addressed had low repercussions among users, the

low number of likes and comments on the posts suggests poor articulation. This fact, combined with the tendency to publish informative posts with little depth in important topics in cervical cancer prevention, suggests the need for better theme articulation by health professionals on Instagram. Other studies focusing on periods other than the March Lilac campaign need to be carried out to determine whether the content of the publications assume topics other than just campaign matters.

Thus, as youth and young adults are the largest consumers of Instagram content and that health professionals have used this type of social media to disseminate content related to cervical cancer, it is possible to speculate that Instagram has the potential to be part of health communication strategies. However, there is a need to incorporate media tools more closely linked to the reality of young people in order to ensure that the topic of cervical cancer gains notoriety among this population. Thus, we believe that the data presented herein may be relevant for future discussions about Instagram's potential to offer the cervical cancer control campaign new opportunities to reach the target audience.

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