

## Drugs and infodemic: social media analysis in the first year of the COVID-19 pandemic

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**ABSTRACT**

The first year of the COVID-19 pandemic brought critical scientific advances at speeds never seen before. The information from scientific studies won the world in news and social media. However, the spread of fake news provided an infodemic among a still unknown disease and no scientifically proven treatment. The present study aimed to evaluate the content and type of information on drugs indicated for the treatment of COVID-19 without scientific evidence in Brazilian social media. Two social media, Instagram and Twitter, were selected to search for drug information related to the prevention or treatment of COVID-19. The research was carried out using hashtags: #chloroquine, #hydroxychloroquine, #ivermectin, and #nitazoxanide for Portuguese publications in March 2020 and 2021. Descriptive statistic was used to present the quantitative data. In 2020, chloroquine was the drug with the highest number of publications in both social networks analyzed. The publications addressed the evidence of drug use and shortages, and the vast majority were considered correct information. While in 2021, ivermectin was the predominant drug cited on Instagram, while chloroquine was the most published on Twitter. Both drugs were related to “early treatment” and political and ideological content, classified as mostly disinformation. Thus, it is necessary to reinforce these social media guidelines to reduce the spread of health disinformation to the population. At the same time, health education in digital media is supported to ensure that the best information on management and care for COVID-19 reaches people and promotes their quality of life.

**Keywords:** COVID-19; social media; drugs; pandemic.

**Medicamentos e infodemia: análise de mídias sociais no primeiro ano da pandemia de COVID-19****RESUMO**

O primeiro ano da pandemia da COVID-19 trouxe avanços científicos críticos a velocidades nunca vistas. As informações científicas conquistaram o mundo nas notícias e nas redes sociais. No entanto, a disseminação de *fake news* consolidou uma infodemia entre uma doença ainda desconhecida e nenhum tratamento comprovado cientificamente. O presente estudo teve como objetivo avaliar o conteúdo e o tipo de informação sobre medicamentos indicados para o tratamento da COVID-19 sem evidências científicas nas redes sociais brasileiras. Duas redes sociais, Instagram e Twitter, foram selecionadas para pesquisar informações sobre medicamentos relacionadas à prevenção ou tratamento da COVID-19. A pesquisa foi realizada com as hashtags: #cloroquina, #hidroxicloroquina, #ivermectina e #nitazoxanida para publicações em português em março de 2020 e 2021. Estatística descritiva foi utilizada para a apresentação dos dados quantitativos. Em 2020, a cloroquina foi o medicamento com maior número de publicações nas duas redes sociais analisadas. As publicações abordaram as evidências de uso e escassez do medicamento, sendo a grande maioria considerada informação correta. Já em 2021, a ivermectina foi predominante no Instagram, enquanto a cloroquina foi a mais publicada no Twitter. Ambos os medicamentos foram relacionados ao “tratamento precoce” e ao conteúdo político-ideológico, classificadas principalmente como desinformação. Assim, é necessário reforçar as diretrizes das mídias

sociais para reduzir a disseminação da desinformação em saúde para a população. Ao mesmo tempo, a educação em saúde nas mídias digitais tem como objetivo garantir que as melhores informações sobre manejo e cuidado da COVID-19 cheguem às pessoas e promovam qualidade de vida.

**Palavras-chave:** COVID-19; mídia social; medicamentos; pandemia.

## 1 INTRODUCTION

To pay attention to the great global changes in automation technology, information, and instantaneity, witness the impact of the same from major events in health globally, as the pandemic of COVID-19 (HAMID; MIR; ROHELA, 2020). This event began in December 2019 in Wuhan, China, spreading uncontrollably around the world, compromising the various sectors of social life, particularly the health systems (SINGH *et al.*, 2020).

The action of the viral family characterizes this disease, reputed as coronavirus, which, due to a history of knowledge, generates respiratory infections (DARIYA; NAGARAJU, 2020). However, its treatment is still unknown, and social isolation measures are necessary to reduce viral transmissibility effectively (NUSSBAUMER-STREIT *et al.*, 2020). The pandemic changed the behavior and lifestyle of individuals, in addition to the relationship between them (ALI; ALHARBI, 2020).

COVID-19 impacted this change in social relationships, but it was somehow mitigated by digital technology, which was driven by the Internet (SHETH, 2020). This plays the role of reducing the necessary distance, amplifying, and disseminating, on large scale, the information surrounding the disease (ROVETTA; BHAGAVATHULA, 2020). The information present on the Internet circulates on digital information portals and social media platforms, such as Instagram and Twitter, forming an information ecosystem in which platforms gain prominence.

With the emergence of this information ecosystem, the information flow conditions were created to produce and circulate disinformation, incorrect information, and infodemic. Infodemic can be defined as "an excess of information, some accurate and some not, which makes it difficult to find reputable sources and reliable guidance when needed" (PAHO, 2020). Also, according to a PAHO (The Pan American Health Organization) document,

The word infodemic refers to a large increase in the volume of information associated with a specific subject, which can multiply exponentially in a short time due to a specific event, such as the current pandemic. In this situation, rumors and misinformation arise and the manipulation of information with dubious intent. In the information age, this phenomenon is amplified by [digital] social networks, and it spreads quickly, like a virus (PAHO, 2020, p. 2, our translation).

In this context, Waszak, Kasprzycha-Waszaj and Kubanek, state that the information circulating through digital social media is instantly consumed and disseminated without support or critical analysis of the quality of information, thus reinforcing the spread of fake news (WASZAK; KASPRZYCKA-WASZAK; KUBANEK, 2018).

Claire Wardle considers that the term fake news, which is widely used in everyday life, is not suitable for understanding false information, considering that there are several nuances in the information classified as fake news, including news that is not fake (WARDLE, 2018). In this perspective, it is understood that, concerning the circulation of so-called fake news, there is: a) information that is false, but that people who are disclosing it believe to be true, called misinformation; b) false information created to cause harm and that the people who disclose it know is false, called disinformation and c) information that is based on reality and that is created, produced and distributed to cause harm, called malinformation (WARDLE, 2019; WARDLE; DERAKSHAN, 2019).

As an active example, there is the mass dissemination of possible use of chloroquine and hydroxychloroquine in COVID-19 treatment, which promoted social unrest and increased consumption of these drugs in Brazil (TAPIA, 2020). It is noteworthy that the participation of health professionals, such as pharmacists, through pharmaceutical assistance, guiding the administration of drugs is necessary (RUBERT et al., 2021; MIGUEL; CARVALHO, 2021). Consequently, this fact led the *Agência Nacional de Vigilância Sanitária* (National Health Surveillance Agency) to stipulate that these drugs were included in ordinance 344 of 1998, with special control (BRASIL, 2020). With the advancement of research, new evidence was generated. The treatment was attributed to the expression "early treatment" and later condemned its use in treating COVID-19 in any degree of involvement of the disease by any patient (LAMONTAGNE et al., 2021).

However, chloroquine and hydroxychloroquine were objects and a slogan for disinformation concerning the insufficient scientific evidence as a form of prevention or

COVID-19 treatment. Drugs used for hypertension, antiparasitics such as ivermectin and nitazoxanide, and vitamins also suffered from disinformation in this context (LOTFI; HAMBLIN; REZAEI, 2020). The world scientific community explains that, so far, there is no effective drug, scientifically proven, that provides care for the effective treatment of COVID-19 in the initial stages of the disease. All treatment in this situation refers to controlling the symptoms (SERAFIN *et al.*, 2020; THE LANCET, 2020). It is noteworthy that, practical strategies for managing the disease have been shown with the use of vaccines and maintenance of measures of social distancing and proper use of masks (SHEN *et al.*, 2021).

The information disorder and the creation of “disinformation” about the treatment of COVID-19 may be factors that affect the health and quality of life of the Brazilian population (MIAN; KHAN, 2020). This study aimed to evaluate the content and type of information related to drugs during the first year of the COVID-19 pandemic on social media, Instagram, and Twitter in Brazil.

## 2 METHODS

It is an observational descriptive study, with quali-quantitative approach, to analyze publications related to drugs to prevent or treat COVID-19. The data was collected from Twitter and Instagram. These digital social media were selected because they are the most accessed in Brazil and for the facility of data collection and analysis. The drugs evaluated were chloroquine, hydroxychloroquine, ivermectin, and nitazoxanide. These drugs were chosen first because they have been widely prescribed for the treatment of COVID-19 in Brazil, and second because even after the scientific proof of their non-efficacy for the disease, their use continued to be encouraged by several health departments and prescribers. Data collection was conducted at two different times: March 2020, the period in which the virus began to spread in Brazil and quarantine in several Brazilian cities, and March 2021, after one year of pandemic.

The first 50 public posts in the "most recent" section were analyzed by searching for the hashtags according to the name of the drugs. The hashtags used were: #chloroquine, #hydroxychloroquine, #ivermectin and #nitazoxanide. The data was collected regarding the metrics of each social media. The author's profile of the publication was verified (account



authenticity informed by the platform) and if he was a health professional (profile self-declaration). Content analysis of the publications was performed based on the type of information, namely: correct information, disinformation, incorrect information, and malinformation, according to Wardle (2019).

Publications in Portuguese from each digital social media under analysis were evaluated in the classification "most recent". Their content should refer to the drug and the coronavirus or COVID-19. Posts that did not fit these criteria were excluded from the analysis. To decrease search biases and algorithm influence, the "History" and later "Clear History Data" have been removed. The data were analyzed by at least three previously trained researchers from the research group. Descriptive statistics were used to present quantitative data.

Regarding the ethical aspects of the study, we ensured the preservation of the anonymity of the authors of the posts, since the proposal was to evaluate their content. Ethical implications of this type of study, from a theoretical point of view, are related to the relevance and urgency of discussions about infodemy in the current informational ecosystem, in which information about drugs (object of the current study) circulates in a disorganized manner, which can bring harmful effects to the health of consumers of this type of content, to the extent that their drug consumption practices are crossed by these sources of information.

### **3 RESULTS**

At the beginning of the pandemic, in March 2020, we observed more posts for chloroquine on social media, Instagram, and Twitter. It was noticed that Twitter was the social media that presented the highest number of publications from verified profiles. However, regarding the origin linked to profiles declared belonging to health professionals, it was observed that Instagram was the media where this parameter was more frequent (Table 1). In the first analysis, the posts of chloroquine and hydroxychloroquine mention the treatment of other diseases than COVID-19. Regarding the description of published content, news from press vehicles were the most frequent on Twitter. Posts about chloroquine and hydroxychloroquine shortages were also observed. As well as information of ideological/political content related to nitazoxanide, in both social media (Table 1).

**Table 1** - Analysis of the characteristics of the content posted on Instagram and Twitter from Brazilian profiles on the drugs chloroquine, hydroxychloroquine, ivermectin, and nitazoxanide related to COVID-19 in March/2020.

Characteristics	Instagram				Twitter			
	Chloroquine (%)	Hydroxychloroquine (%)	Ivermectin (%)	Nitazoxanide (%)	Chloroquine (%)	Hydroxychloroquine (%)	Ivermectin (%)	Nitazoxanide (%)
Verified profile	0	0	0	0	10,5	0	0	20
Healthcare professional	39,1	33,3	15,4	50	15,8	14,3	25	20
<b>Categorization</b>	-	-	-	-	-	-	-	-
Indication to treat other diseases	34,8	11,1	-	-	-	-	-	-
Covid-19 treatment	65,2	88,9	100	95,5	100	100	100	100
Covid-19 Early Treatment	-	-	-	4,5	-	-	-	-
<b>Content description</b>	-	-	-	-	-	-	-	-
Political/Ideological	4,3	-	-	-	-	-	-	-
News	30,4	11,1 <sup>d</sup>	38,5 <sup>e</sup>	9 <sup>g</sup>	57,8 <sup>h</sup>	21,4 <sup>j</sup>	75	60 <sup>l</sup>
Self-medication	39,3 <sup>a</sup>	33,3 <sup>c</sup>	-	-	-	-	-	-
Personal information	-	11,1	-	-	10,5 <sup>i</sup>	35,8 <sup>k</sup>	-	-
Direct information about Covid-19	26 <sup>b</sup>	27,8	61,5	45,5	21	21,4	25	40
Meme	-	-	-	-	5,3	-	-	-
Shortages	-	16,7	-	45,5 <sup>f</sup>	5,3	21,4	-	-
<b>Type of information</b>	-	-	-	-	-	-	-	-
Correct information	100	100	92,3	100	89,5	92,8	75	100
Disinformation	-	-	-	-	-	-	-	-
Incorrect information	-	-	-	-	-	-	25	-
Malinformation	-	-	7,7	-	10,5	7,2	-	-
<b>Active publications</b>	100	100	100	100	100	100	100	100

**Source:** Elaborated by the authors.

**Legend:** (a) 39.3% self-medication, with 11.1% about self-medication + lack of supply; (b) 26% direct information about covid, with 16.6% officially reported by a health agency; (c) 33.3% self-medication related to shortages, with 16.7% being publications on self-medication/shortfalls made by an official health agency; (d) 11.1% news, with 5.6% news of shortages; (e) 38.5% news, 20% being personal and 20% about self-medication; (f) 45.5% shortages, 10% on shortages and self-medication; (g) 9% news, with 4.5% news about politics; (h) 57.8% news, with 18.1% news of shortages; (i) 10.5% personal information, 50% on personnel and shortages; (j) 21.4% news, with 66.7% about news and shortages; (k) 35.8% personal information, 40% on shortages; (l) 60% news and 33.3% political news.

For content description, in the two social media evaluated, the higher number of posts directly related to COVID-19 were those of ivermectin and nitazoxanide. Much information was directed towards the shortage of chloroquine, hydroxychloroquine, and nitazoxanide in pharmacies, due to the increased consumption directed towards the treatment/prevention of COVID-19 (Table 1).

The type of information was evaluated according to scientific data at the analyzed period. So, in 2020, all the analyzed posts for chloroquine, hydroxychloroquine, and nitazoxanide, on Instagram were considered correct information. On Twitter, the percentage of correct information was extremely high for the four medications evaluated. On the other hand, we observed that 25 % of the posts referring to ivermectin were classified as incorrect information, and malinformation was verified in the posts of chloroquine and hydroxychloroquine, 10.5 % and 7.2 %, respectively (Table 1). It is noteworthy that the publications evaluated in this article were active on social media until April 2021. Figure 1 shows some examples of fake news analyzed.

**Figure 1** - Examples of publications according to the classification of the type of information conveyed in each one for the drugs analyzed about COVID-19 on Instagram and Twitter of Brazilians in March 2020.



**Source:** Elaborated by the authors.

**Legend:** panel (A): Instagram publication classified as malinformation about ivermectin, (B): Twitter publication classified as malinformation about chloroquine, (C): Twitter publication classified as malinformation about hydroxychloroquine, (D): Twitter post classified as incorrect information about ivermectin.

For the publications made in March/2021, posts with references to ivermectin were more frequent on Instagram (24), while on Twitter, it was with chloroquine (23). Health professionals used Instagram more often to post information about medications taken, while on Twitter, only for hydroxychloroquine (5.3%) (Table 2).



**Table 2** - Analysis of the characteristics of the content posted on Instagram and Twitter from Brazilian profiles on the drugs chloroquine, hydroxychloroquine, ivermectin and nitazoxanide related to COVID-19 in March/2021.

Characteristics	Instagram				Twitter			
	Chloroquine (%)	Hydroxychloroquine (%)	Ivermectin (%)	Nitazoxanide (%)	Chloroquine (%)	Hydroxychloroquine (%)	Ivermectin (%)	Nitazoxanide (%)
Profile and publication information								
Verified profile	14,3	0	0	0	0	10,5	0	0
Healthcare professional	14,3	27,7	16,7	33,3	0	5,3	0	0
<b>Categorization</b>	-	-	-	-	-	-	-	-
Covid-19 treatment	28,6	16,7	-	-	21,7	26,3	22,2	-
Covid-19 Early Treatment	71,4	83,3	91,7	94,4	78,3	68,4	77,8	100
Early treatment + diagnosis	-	-	8,3	-	-	-	-	-
Early treatment + adverse effects	-	-	-	5,6	-	-	-	-
Early treatment + treatment	-	-	-	-	-	5,3	-	-
<b>Content description</b>	-	-	-	-	-	-	-	-
Political/Ideological	85,7	27,7 <sup>a</sup>	37,5	33,3	30,4	21	22,2	41,7
News	14,3	16,6	-	11,1	-	5,3	-	-
Self-medication	-	5,6	8,3	5,6	-	-	-	-
Personal information	-	5,6	-	-	-	-	-	-
Direct information about Covid-19	-	38,9	54,2	50	69,6	73,7	77,8	58,3
Meme	-	5,6	-	-	-	-	-	-
<b>Type of information</b>	-	-	-	-	-	-	-	-
Correct information	28,6	27,7	25	38,9 <sup>b</sup>	52,2 <sup>c</sup>	36,8	5,6	16,7
Disinformation	71,4	66,7	58,3	61,1	47,8	52,6	94,4	75
Incorrect information	-	5,6	-	-	-	-	-	-
Malinformation	-	-	16,7	-	-	5,3	-	8,3
<b>Active publications</b>	100	100	94,4	94,4	100	100 <sup>d</sup>	100	100

**Source:** Elaborated by the authors.

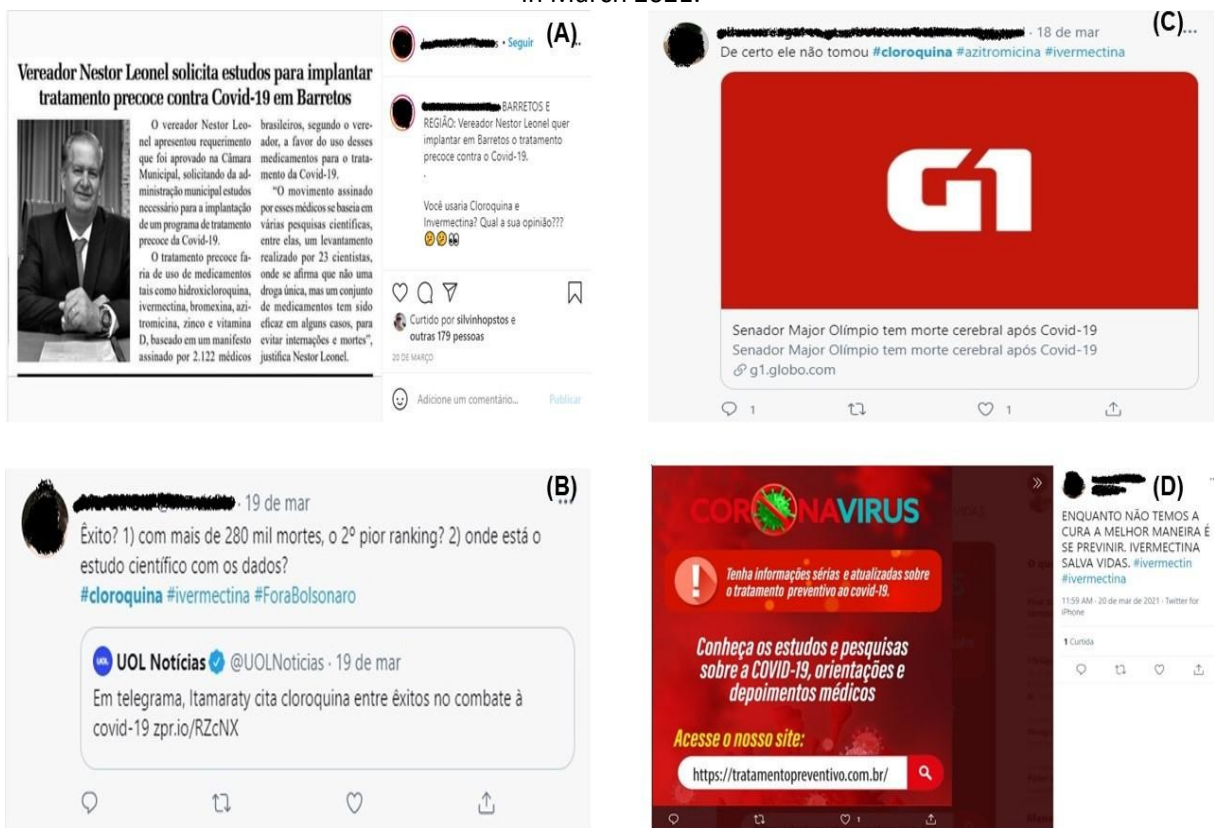
**Legend:** (a) 27.7% political and 20% made a critique in the form of poetry; (b) 38.9% correct information, with 14.3% correcting a fake news; (c) 52.2% correct information, 25% correcting false information and 8.3% using irony to pass on a message; (d) 5.3% post with double interpretation.

Regarding the categorization of information from publications in 2021, it is known that the initial treatment for COVID-19 was the most frequent in both social media. With a highlight to nitazoxanide with 94.4% on Instagram and 100% on Twitter (Table 2).

The analysis of the content description shows that the political/ideological category was present in both social media for all drugs. Most frequently on Instagram for chloroquine (85.7%) and Twitter for nitazoxanide (41.7%). The posts that mentioned ivermectin were the ones that had the most direct information about COVID-19 both on Instagram and Twitter, 54.2% and 77.8%, respectively (Table 2).

The type of information published about drugs on Instagram showed the superiority of disinformation for all analyze posts, especially chloroquine, with a frequency of 71.4%. On Twitter, chloroquine deserves to be highlighted for its higher rate of correct information when compared to other drugs (52.2 %), 25 % of this information was published to correct false information, and 8.3 % used irony to convey the correct information. While for the other drugs, disinformation was the most frequent, being 94.4 % of ivermectin posts (Table 2). Unlike the posts evaluated in 2020, in April 2021, it was found that 6.6 % of the material analyzed was taken from Instagram. They referred to the drugs ivermectin and nitazoxanide. Figure 2 brings some examples of publications analyzed concerning the type of information provided in March 2021.

**Figure 2** - Examples of publications according to the classification of the type of information conveyed in each one for the drugs analyzed about COVID-19 on Instagram and Twitter of Brazilians in March 2021.



**Source:** Elaborated by the authors.

**Legend:** panel (A): Instagram post classified as disinformation on chloroquine, (B): Twitter post classified as correct information on chloroquine correcting incorrect information, (C): Twitter post classified as correct information on chloroquine containing irony, (D): Twitter post classified as disinformation about ivermectin.

#### 4 DISCUSSION

In the present study, it is possible to observe the diversity of the citation of drugs reported involving COVID-19 on digital social media during the coronavirus pandemic. Similar results were observed in a Taiwan study (WANG *et al.*, 2020). Cinelli *et al.* (2020) found a lot of posts that were classified as misinformation in social media.

The posts content relative to the beginning of the pandemic evaluated in the present study were more careful about drugs indication. This scenario was changed in the following year. But this change was worse due to the increase in false content, not based on scientific evidence (BARCELOS *et al.*, 2021).

In March 2020, there was an intense movement to supply chloroquine and hydroxychloroquine by the Ministry of Health and government agencies (SILVA, 2021). Over the period, the federal government's position, with news of statements that reduced the proportions of the pandemic or even boosted the use of drugs without scientific proof, brought uncertainty to the population (SANTOS-PINTO; MIRANDA; OSORIO-DE-CASTRO, 2021). Along with that, there was a change of command in the Ministry of Health four times, generating instability in the government's conduct regarding the pandemic (HALLAL, 2021).

Nevertheless, the distribution of drug kits without scientific evidence to the population for the treatment and prevention of the disease, called "Kit COVID", can aggravate the condition in various parts of the country (SANTOS-PINTO; MIRANDA; OSORIO-DE-CASTRO, 2021). It is noteworthy that the "Kit COVID" has been created since the beginning of the pandemic, supported by the "Physicians for Life", which is an organization aimed at perpetuating and disseminating the "Early Treatment of Covid-19" in the country (FURLAN; CARAMELLI, 2021). Several patient reports were using this treatment that had worsened the infection. Some of them developed hepatotoxicity due to ivermectin, requiring liver transplantation (PASSARINHO, 2021). The WHO itself reinforced the non-use of these drugs for treatment and "early treatment" because there is no scientific evidence to prove its use (WHO, 2021).

Thus, it can be suggested that the increase in fake news in the second year of the pandemic observed in the social media evaluated in the present study, may have been stimulated by this politicization installed in Brazil about the treatment of covid-19 based on

drugs without efficacy. As well as Yang et al. identified that publications in the United States could characterize an inevitable “politicization of the pandemic” (YANG; TORRES-LUGO; MENCZER, 2020). While in 2021, publications political/ideological bias stands out, with expressions such as “early treatment”, for all medications in both networks (XAVIER *et al.*, 2020).

With the high speed of information generation added to the great dispersion of the disease, health professionals must provide faster responses to the population and assess whether measures taken are effective or not in containing the disease (XAVIER *et al.*, 2020). Thus, health professionals also used digital social networks to disseminate information related to COVID-19 (BIREME, 2020). This study clearly shows that Instagram was the digital social media platform with the highest dissemination of information published by professionals compared to Twitter. In this scenario, the importance of ethical reflection on the analysis of the quality of information by health professionals is highlighted in using digital social media for this purpose. It reflects on the social weight inflicted on professionals and the engagement generated in the networks.

Thus, it is up to the professional to critically reflect on the scientific evidence related to the subject of their publication to convey the correct information on the topic, being responsible for it (HAZZAM; LAHRECH, 2018). It is the responsibility of the individual who publishes on social media to re-evaluate their posts in case of new evidence about the subject. In the question of verified profile, the authenticity that digital social media platforms attest only to the user profile while not requiring proof of professional credentials or academic qualifications (AL-BALUSHI, 2020).

In 2020, the analysis of the categorization of information showed that the content was related to treatments. During the pandemic, there was an intense movement of institutions related to scientific research and dissemination to demonstrate the most diverse evidence associated with the new virus, its infection, and its treatment (ATRI *et al.*, 2020). Thus, in 2021, there is still no capable drug to treat COVID-19, promoting its cure, only prevention with vaccines associated with preventive measures such as the use of masks, social isolation when possible, and keeping hands clean (LI; LI; WANG, 2021).

The descriptions of content observed in the publications in 2020 are related to the drugs shortage in drugstores. This fact could be associated with improving the disease, directly



or through news, which made, like chloroquine, a drug with special control (CORRÊA; VILARINHO; BARROSO, 2020).

The type of information conveyed by social networks in 2020 prevailed with correct information that referred to treatments based on scientific evidence at the time. The same analysis in 2021 presents the opposite scenario, with most posts classified as disinformation, emphasizing political/ideological motivation. A similar profile was found in Twitter publications in the United States, with low-quality information (YANG; TORRES-LUGO; MENCZER, 2020). In Brazil, in 2021, on Instagram and Youtube malinformation about ivermectin prevailed (BRAVO *et al.*, 2021). Soares *et al.* (2021) point out that Instagram can be used to disseminate disinformative discourse about Covid-19 especially in profiles such as political leaders using their authority and reputation due to their public office. Thus, the authors recommend that there is active monitoring by the platform, especially of political profiles.

There was also a change in the scenario in social networks concerning the content of publications. Until the beginning of April 2021, all 2020 publications evaluated for the present were still active, which did not happen with the collected 2021 publications. In 2021, to combat the dissemination of fake news related to COVID-19, both social media adopted changes in their guidelines on publications. Thus, measures such as image censorship, publication removal, or banning users who disrespect the new rules for using digital social media were observed. In this way, attention is paid to the constant modification of platforms, where teams will remain monitoring, from the algorithm to the user profile (PEREIRA; SILVA, 2020). This removal of the publications from social media shows two aspects: in March 2021 more fake news were posted, so much so that they were removed, and that social media managers are starting, even if very slowly, policies to recognize posted information that can generate great damage to the population.

As a limitation of the present study, the monitoring of drugs carried out on digital social media can be highlighted through the interface of the media itself, where the search was carried out manually by a user of the network. There was no use of software or applications that could randomize data collection and allow macro analysis. In 2020 there was an alarming increase in scientific studies number on COVID-19, from genetic sequencing of the virus to pharmacological treatment and the impact of the pandemic on individuals. In 2019



there were 17 articles published with the theme COVID-19, and this number increases to 120,611 by April 05, 2021, according to the United States National Library of Medicine database. There is no precedent in world history for this vertiginous increase in scientific publications on the same subject in a brief period. Another point that can be considered is the dynamism of digital social media, the freedom to post the way you want, whether true or not. The high number of followers of various profiles makes information spread quickly, which was not always true.

## 5 CONCLUSIONS

We concluded that digital social media have become an instrument capable of supporting and accelerating the infodemic applicable to the pandemic by COVID-19. It points to the urgency of developing preventive actions in the field of health and concerning the circulation and consumption of information. Although it is not possible to state that the entire society is digitally included, it must be recognized that the amplification of the possibilities of access to the Internet (mainly through cell phones), the production and consumption of information through digital social networks favor the spread of disinformation. We demonstrated a dissonance between the results of scientific research and the messages conveyed on the topic on digital social media.

Thus, there is an urgent need for a set of actions, coordinated with public policies aimed at combating the pandemic and infodemic, among which: a) concrete and practical actions of digital social networking platforms to combat disinformation; b) expansion, by health surveillance agents, of the occupation of digital social media platforms, to disseminate correct and verified information; c) expansion, on the part of science disseminators, of the occupation of digital social media platforms and engagement in the dissemination of scientific research results to the general public; d) actions aimed at information competence and the broader education of the population in the critical, ethical and solidary use of information sources, including digital social media platforms.

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