Original Article

Health communication and misinformation about COVID-19 in the fact-checking of fake news *

Comunicação em saúde e desinformação sobre COVID-19 em *fact-checking de fake News*

Comunicación sanitaria y desinformación sobre el COVID-19 en el *fact-checking* de noticias falsas

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Resumo

Objetivo: analisar *fake news* sobre COVID-19 veiculadas no *site fact-checking* "Aos Fatos". **Método:** pesquisa transversal descritiva, realizada com dados publicados no período de janeiro a dezembro de 2020, no *site fact-checking* "Aos Fatos". A coleta ocorreu de 25 a 29 de janeiro de 2021 e a amostra foi composta por 205 *fake news*, submetidas à análise de frequência absoluta e relativa. **Resultados:** as notícias versavam sobre a gravidade da COVID-19 (27,3%), as vacinas em desenvolvimento (20%) e a escolha de medicamentos (13,7%). **Conclusão:** o compartilhamento de informações falsas sobre a COVID-19 contribuiu para descrença na ciência, o que pode ter comprometido a adesão às medidas oficiais de prevenção preconizadas no Brasil e influenciado negativamente a adesão da população. As *fake news* circulantes devem ser monitoradas e refutadas para que informações genuínas cheguem ao público.
Descritores: Infecções por Coronavírus; COVID-19; Desinformação; Comunicação em Saúde; Saúde Pública

Abstract

Objective: to analyze *fake news* about COVID-19 published on the *fact-checking website* "Aos Fatos". **Method:** descriptive cross-sectional research, carried out with data published from

January to December 2020, on the *fact-checking website* "Aos Fatos". The collection took place from January 25 to 29, 2021 and the sample consisted of 205 *fake news*, submitted to absolute and relative frequency analysis. **Results:** the news was about the severity of COVID-19 (27.3%), the vaccines under development (20%) and the choice of drugs (13.7%). **Conclusion:** the sharing of false information about COVID-19 contributed to disbelief in science, which may have compromised adherence to official prevention measures recommended in Brazil and negatively influenced the adherence of the population. Circulating *fake news* must be monitored and refuted for genuine information to reach the public.
Descriptors: Coronavirus Infections; COVID-19; Disinformation; Health Communication; Public Health

Resumen

Objetivo: analizar noticias falsas sobre COVID-19 publicadas en el sitio web de verificación de datos "Aos Fatos". **Método:** investigación descriptiva transversal, realizada con datos publicados de enero a diciembre de 2020, en el sitio web de verificación de hechos "Aos Fatos". La recolección se realizó del 25 al 29 de enero de 2021 y la muestra estuvo conformada por 205 noticias falsas, sometidas a análisis de frecuencia absoluta y relativa. **Resultados:** las noticias fueron sobre la gravedad de la COVID-19 (27,3%), vacunas en desarrollo (20%) y elección de medicamentos (13,7%). **Conclusión:** el intercambio de informaciones falsas sobre la COVID-19 contribuyó a la desconfianza en la ciencia, lo que pudo haber comprometido la adhesión a las medidas oficiales de prevención recomendadas en Brasil e influyó negativamente en la adhesión de la población. Las noticias falsas que circulan deben ser monitoreadas y refutadas para que la información genuina llegue al público.
Descriptores: Infecciones por Coronavirus; COVID -19; Desinformación; Comunicación en Salud; Salud Pública

Introduction

The media have undergone changes with the exponential technological advance of recent decades. Information vehicles, such as letters, newspapers, telegrams and telephone calls, needed days to reach a large number of people and were replaced by instant messages through applications, such as WhatsApp and other social networks.[1] Driven by the US elections in 2016, the term fake news became popular and was elected the word of the year 2017, defined as false information disseminated under the pretext of reports.[2] Fake news deliberately broadcasts fake content, always with the intention of gaining an advantage, whether financial, political or electoral.[3]

In health, the spread of false news can have an even more worrying effect due to the ability to change routines and behaviors related to the prevention and treatment of diseases.[4-5] In the current scenario, information quickly reaches a large number of people, with effects for the population. Thus, the media needs to contain the spread of

rumors in order to identify and decrease the visibility of "urgent" news from unreliable sources to give way to legitimate content.[6]

The Superior Electoral Court (SEC) used the phrase "if it is fake news, do not broadcast" in a campaign with an emphasis on reducing the spread of fake news and its negative impacts.[7] The Ministry of Health (MH), for example, provided a number of Whatsapp for the verification of news and encouraged the population to send photos and texts with questionable veracity to be checked and then confirmed if they were real or not.[8]

A survey that assessed the use of Information and Communication Technology (ICT) revealed that in 71% of households had access to the internet and 47% used it to seek health information.[9] With the need to check the news, the fact-checking sites emerged, which are increasingly necessary, as they specialize in identifying the news shared more frequently and investigating their origin and veracity.[10]

Duke Reporter's Lab carried out a worldwide mapping of fact-checking sites and registered, in 2020, a number four times higher, compared to the result of 2014. In Brazil, 10 sites were identified, 3 independent and 7 affiliated with communication companies. Among these, the Lupa Agency and the *Aos Fatos* website stood out for being long-lived, independent organizations and acting in accordance with the International Fact-Checking Network (IFCN) code of principles.[10-11] IFCN guidelines are: commitment to non-partisanship and justice; transparency of sources; transparency of funding and organization; transparency of methodology; with an open and honest corrections policy.[10]

In December 2019, rapid sharing of virtual information was identified after the disclosure of pneumonia of unknown cause in China,[12] caused by a new type of coronavirus, called SARS-CoV-2. On March 11, 2020, the World Health Organization (WHO) declared a COVID-19 pandemic state.[13] Given the thematic relevance, this study aimed to analyze fake news about COVID-19 published on the fact-checking website "Aos Fatos".

Method

This is a descriptive cross-sectional research, carried out on the site fact-checking "Aos Fatos", available at the URL < www.aosfatos.org >, chosen because it is in the public domain, is in accordance with IFCN guidelines and operates in Brazil.

The data collection took place from January 25 to 29, 2021 and the source of information consisted of news analyzed by the site Aos Fatos after the alert of the COVID-19 pandemic. The news collection stage was performed by one undergraduate student and two PhD who read the news and the initial selection based on the content.

During the data collection period, there were five visits to the site for observation and thorough analysis of the news, conference between the collectors and confirmation of inclusion or not in the study. To streamline the news screening process, semi-automation was carried out using the Rayyan application with sharing between two researchers. The cases of disagreement were reviewed by the third researcher in order to minimize biases in the selection process.

The inclusion criteria adopted were news related to COVID-19, which contained in their text the words "COVID-19", "Coronavirus", "SARS-CoV-2" and "Coronavac", chosen for their strong relationship with the study theme and frequency of use in the texts published by the site. The collection made it possible to include the news published on January 5, 2020, the date of the first WHO alert, to December 23, 2020 and considered by the site as false news. News that did not reach a consensus between at least two researchers was excluded.

After applying the criteria for refining the news, a sample of 205 fake news was obtained. Each selected news item was read in full and grouped into categories according to the targets of misinformation, that is, a description that each news starts to have when posted on the site. Thus, the categorization was made from the frequency that issues related to the coronavirus were addressed as the target of false news.

Initially, the fake news was organized considering the variables: title of the fake news; access link; target; date of publication; subject descriptor identified; and authorship. For the variable date of publication, it was decided to group the news by quarter in order to analyze the distribution.

The next stage consisted of organizing the news from the main subject, which resulted in the creation of the categories: vaccines; medicines; severity; politics; recipes; origin; mask; isolation; panic; coup; and misinformation.

To enable the analysis, the news marked and considered false in the study period was scanned in a *Microsoft Excel* XP spreadsheet. Then, we proceeded to the descriptive analysis of the data, with calculation of absolute and relative frequencies, which were presented in a table. To describe the records and stages of this research, the authors followed the guidelines of the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE).[14]

The study did not require the appreciation of a Research Ethics Committee for using information in the public domain. However, all ethical precepts were observed and followed at all stages of the research, preserving the identity and anonymity of the authors of the analyzed news.

Results

We selected 205 fake news, which comprised the sample of this study. In order to enable detailed analysis, the news was organized initially according to the code and then according to the category. However, it was also decided to insert the description of each category to facilitate understanding, as shown in Box 1.

Box 1 – Code and description of the categories used to group fake news. Natal, RN, Brasil.

Code	Categories	Description
Severity	Minimize the severity of COVID-19	News stating that the number of deaths reported is higher than the real number, implying that the pandemic is a farce, a common virus or that it does not require the measures recommended by the WHO.
Vaccine	Misinformation about vaccines	News that aims to discourage vaccination through false information about the development, objective or effects of vaccines in the prevention of COVID-19.
Medications	Promote the use of medications without scientific proof	News involving existing or developing medications that do not have scientific proof of their effectiveness in the prevention or treatment of COVID-19.
Policy	Misinformation for political purposes	False news about the conduct or with the aim of supporting the ideology of some politician.
Medical prescription	Miracle medical prescriptions	False claims about foods that can cure, immunize, or eliminate COVID-19.
Origin	Origin	Unproven theories, conspiracies or accusations of the

		origin of the virus (SARS-CoV-2).
Mask	Recommendation against the use of the mask	Recommendations contrary to WHO guidelines or false statements related to the use of masks.
Isolation	Recommendation against isolation/social distancing or lockdown	Recommendations contrary to WHO guidelines or false recommendations related to isolation/social distancing or lockdown.
Panic	News that causes panic	News whose objective is to aggravate or generate a sense of fear and panic in the population.
Coup	Coup	News whose purpose is to collect bank details or personal information of the victims.
Misinform	Misinform	News whose main objective is to misinform about a subject.

WHO = World Health Organization

In order to present the distribution of the 205 fake news regarding the target of the news, the results were compiled by quarter. Thus, the 1st quarter corresponded to the months of January to March 2020, the others being arranged sequentially until the 4th quarter with the news published in the months of October to December 2020 (Table 1).

Table 1 - Results categorized according to targets of fake news by quarters. Natal, RN, Brazil, 2021. (n=205)

Category	1st Quarter (34)		2nd Quarter (70)		3rd Quarter (63)		4th Quarter (38)		Total (205)	
	n	%	n	%	n	%	n	%	n	%
Severity	8	23.5	30	42.9	12	19.0	6	15.8	56	27.3
Vaccine	3	8.8	2	2.9	10	15.9	26	68.4	41	20.0
Medications	3	8.8	9	12.9	14	22.2	2	5.3	28	13.6
Policy	2	5.9	7	10.0	12	19.0	1	2.6	22	10.7
Medical prescriptions	4	11.8	4	5.7	3	4.8	1	2.6	12	5.8
Mask	-	0.0	7	10.0	4	6.4	-	-	11	5.4
Isolation	3	8.8	4	5.7	3	4.8	-	-	10	4.9
Misinformation	1	3.0	2	2.9	5	7.9	2	5.3	10	4.9
Origin	4	11.8	5	7.0	-	-	-	-	9	4.4
Coup	3	8.8	-	-	-	-	-	-	3	1.5
Panic	3	8.8	-	-	-	-	-	-	3	1.5

The targets of fake news related to the severity (27.3%), vaccine (20.0%) and medication (13.7%) categories were the most frequent in the four quarters of 2020.

When analyzing the severity category alone, it was observed that the largest target of fake news (67.9%) was the number of deaths recorded. The news implied that hospitals and authorities were being paid to inform COVID-19 as the cause of death, followed by false or distorted information about the coronavirus, its characteristics and number of patients affected, with the objective of minimizing the complexity of the pandemic situation (28.6%) and information regarding the delicate public health situation with political content (3.6%).

Most authors of fake news were not identified, which seemed to encourage or favor the inappropriate behavior of generating and disseminating fake news for the simple pleasure of following the speed of its propagation in the media. Another factor that contributed to the non-identification of the origin or authorship of the news is the use of robot algorithms that favor rapid dissemination.

Discussion

Eleven categories of clustering of fake news about COVID-19 were synthesized, which considered the news published in the media and social networks analyzed by the fact-checking website "Aos Fatos" about the contradictory origin of the SARS-CoV-2 virus, severity of the disease, recommendation of "miracle" medications and medical prescriptions without scientific evidence for prevention or treatment, discouragement to vaccination and preventive and disease control measures, spread of panic in the population and, finally, the political influence in this scenario. This information influenced the lives of Brazilians in the critical context of the pandemic.

It was evidenced, in the first quarter of 2020 that the main target of the false news was to try to minimize the severity of the disease. A post on social media with more than 800 thousand shares said "In Manaus, empty coffins are being buried simply to cause panic to the population", another news that improperly presented the logo of the MH stated: "Do not accept death certificates in which the physician is attributing the cause of death to COVID-19".[15]

By disregarding the severity of COVID-19 and leaving the population even more exposed and vulnerable, other researchers corroborate and emphasize that SARS-CoV-2 was able to promote the destruction of pneumocytes and induction of pro-inflammatory response

responsible for the frequent and recurrent symptoms: fever (81.2%), cough (58.5%), fatigue (38.5%), dyspnea (26.1%) and sputum (25.8%).[16] Approximately 14% of the cases may present a reduction in respiratory rate, oxygen saturation and involvement of approximately 50% of the lung parenchyma. Critical cases (<5%) have septic shock and organ failure.[17]

These respiratory complications made the conditions of access of people affected by COVID-19 both in the public and private networks worrying due to the shortage of beds in hospitalization services. Accordingly, a study revealed that 15% of the cases required hospitalization and, of these, 5% needed to be treated in the Intensive Care Unit (ICU), thus increasing the demand for beds in health services and the scarcity of supplies and professionals.[18]

The vaccine category was identified more frequently in the fourth quarter of 2020, when the vaccines from Pfizer, Moderna, Astrazeneca and Coronavac presented essential data for their approval. The United Kingdom was the first country to immunize its population against COVID-19 using the vaccine developed by the partnership between the American pharmacist Pfizer and the biotechnology company BioNTech. As of January 16, 2021, at least 56 countries had started their vaccination plans.[19] In Brazil, the National Health Surveillance Agency (Anvisa) unanimously approved the emergency use of CoronaVac and Covishield vaccines, on January 17, 2021.[20]

In the vaccine category, 36.6% of the news referred to the dangers, adverse effects or consequences of vaccination, 36.6% involved political issues of the national and international scenario, 21.9% pointed out that the tests and results released by the media were false and 4.9% presented misinformation.

In October 2020, audio containing false information about the Coronavac vaccine was widely shared on the WhatsApp messaging app and on Facebook, its content stating that the developing vaccine would result in changes in the genetic code and changes in the sexual orientation of the immunized. The author also stated that vaccination would be mandatory and that COVID-19 would not have caused any deaths in the world. All this information was analyzed and found to be false by the fact-checking "Aos Fatos" website. The results disclosed by regulatory agencies demonstrated that the vaccine had acceptable safety.[21]

It is noteworthy that vaccines are compounds created through the manipulation of bacteria or attenuated or dead viruses, their objective is to generate immunization by

promoting the production of specific antibodies against a particular antigen. Safety is defined from rigorous tests that accompany its long development process.[20]

One of the first stages is called the preclinical phase, in which scientists test the vaccine in cellular or animal models. It is only after obtaining success in this phase that it is possible to start the tests in humans, initially in a small group (Phase 1), followed by a group that may contain hundreds of people, including the elderly and children (Phase 2), until it can be tested in thousands of individuals (Phase 3) with the objective of obtaining sufficient evidence about its effects for its approval.[20-22]

The Pfizer vaccine, also known as BNT162b2, made history by presenting more than 90% efficacy in its initial tests. After a trial with a total of 43,548 participants, who received two doses in a 21-day interval, the vaccine was shown to be 95% effective against COVID-19.[22]

A study in 149 countries from 2015 to 2019 with the objective of mapping global trends related to vaccination identified a reduction in confidence in the importance, safety and effectiveness of immunization. One of the causes pointed out by the authors was misinformation as an adjunct to create a scenario of uncertainties that influences the behavior of the population. The authors also cited how the sharing of false information about polio was responsible for the increase in cases of the disease in Pakistan and Nigeria.[23]

In Brazil, the Fake News are identified as one of the main responsible for the decrease in the number of immunized individuals in the country, its effects are aggravated when it comes to serious epidemics and there is a dangerous combination of information and guidance contrary to scientific knowledge and real facts. The causes that make the practice of non-vaccination increasing in Brazil involve personal beliefs that the vaccine may promote the disease or may not work.[24] The risk associated with the use of vaccines does not justify its interruption in the market and in health practices. On the other hand, "non-vaccination" contributes to the reappearance of infectious diseases, such as measles and pertussis.[25]

The medications category as a target of fake news obtained the third highest percentage; however the frequency of this subject obtained the lowest percentage in the fourth quarter of 2020, revealing that the interest of the authors decreased over time. The medications were cited and disclosed in order to stimulate their use, even without having scientific evidence for COVID-19. Thirty-one medications were cited, with

emphasis on chloroquine/hydroxychloroquine with a percentage of 58.1%. The others were ivermectin (22.6%), azithromycin (9.6%), zinc (6.5%) and Acetyl Salicylic Acid (ASA) (3.2%).

As a result of the misinformation, there was an uncontrolled search for medications in pharmacies. Vitamin C sales, for example, grew 87% in April 2020, compared to April 2019. The demand for medications containing the substance chloroquine also increased, causing Anvisa to change its category to special control. In the first quarter of 2020, there was an increase of 67% in the purchase of this medication.[26] The false information that claimed that chloroquine could prevent and cure COVID-19 left pharmacies without the medication due to demand by the population. As a consequence, patients who needed this medication for the treatment of other diseases were harmed. The stimulation of self-medication was responsible for a considerable increase in serious adverse reactions, even resulting in the death of patients.[27]

The results around the efficacy of chloroquine/hydroxychloroquine treatment were controversial and discouraging. In Shanghai, between February 6 and 25, 2020, a study called "Efficacy and Safety of Hydroxychloroquine for Treatment of COVID-19" was carried out, which found the importance of medication use in reducing viral load, but without bringing further conclusions on the impact on mortality/hospitalization and involving only 30 patients. The trials of the French physician Didier Raoult used the protocol based on the administration of hydroxychloroquine and azithromycin and proved to be effective both in prevention and in the ability to avoid aggravation for newly infected patients, but Raoult's findings were criticized by the scientific community for presenting biases in the choice of the participants and for the absence of a control group in his experiments.[28]

An observational study by Joshua Geleris looked at the relationship between hydroxychloroquine and the amount of intubation and dead people in a hospital in New York City. Of the 1446 patients admitted, 811 received the treatment and did not show a decrease in the rates mentioned.[29] A trial involving 150 patients with mild and moderate COVID-19 identified that there was no difference in the clinical evolution of patients who used the medication and also found several adverse effects related to the use of hydroxychloroquine.[30]

Identifying genuine content in the vast digital universe available, as well as challenging, can become an exhaustive task. Although fact-checking sites are an auxiliary resource, the reader's curiosity is still indispensable to verify the sources cited, compare the information with other authors, and seek new perspectives on a given subject, before sharing on social networks.

Search algorithms tend to guide what has already been seen, tanned and accessed, thus creating an informative bubble that always leads to the same answers. It is at this moment that it becomes essential to have initiative to go beyond what is pleasant and explore new paths in search of the truth.

The limitations of the study include the analysis of news restricted to the records of a journalistic site to verify facts and the difficulty in identifying the authors of this information, factors that indicate the need for further investigations that contribute to this context, in order to broaden the discussion about the impact of fake news about COVID-19.

The study promoted a relevant reflection in the area of public health in view of the negative impact of the dissemination of false news and the influence of political discourse on the adherence of the population to the COVID-19 prevention measures recommended by the official bodies. In addition, it reinforced the need to investigate false news publications and punish those responsible in order to disseminate reliable and scientifically supported information to the population in the prevention and treatment of COVID-19.

While companies responsible for social networks and digital media update their terms and create codes that give preference to true news, it is up to the users to be critical and responsible for what they read and share, recognizing false news for its characteristics and breaking the chain of sharing unverified information.

Conclusion

The analysis of the fake news on the fact-check site "Aos Fatos" revealed that the severity of COVID-19 was the most frequent subject. The texts contained accusations of fraud in certificates, inadequate comparisons with other epidemics or diseases, incorrect counting of the number of deaths and misleading claims about vaccines and medications. The sharing of false information about COVID-19 during the pandemic may

have compromised the population's adherence to the official preventive measures recommended in Brazil and negatively influenced their adoption. Fake-news must be monitored and refuted for genuine information to reach the public.

In the field of health, it is necessary that data, treatments and legitimate recommendations are available in a clear and accessible way, aiming to increase the degree of scientific knowledge of the population. However, it is necessary that new studies relate which groups are vulnerable to fake news and how it is possible to filter data without censoring freedom of expression.

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