

YOUTUBE AND ITS ROLE AS A COMPLEMENTARY INFORMATION STRATEGY TO COMBAT THE COVID-19 PANDEMIC

Data de submissão: 30/07/2023

Data de aceite: 03/07/2023

Rodrigo Lellis Santos

MS in Health, Society and Environment,
Federal University of Jequitinhonha and
Mucuri Valleys (UFVJM)
Diamantina, MG, Brazil
<http://lattes.cnpq.br/2664020738683814>
<https://orcid.org/0000-0002-0160-7299>

Marileila Marques Toledo

MS, Diabetes Study Group, Department
of Basic Sciences, Federal University
of Jequitinhonha and Mucuri Valleys
(UFVJM)
Diamantina, MG, Brazil
<http://lattes.cnpq.br/0570538388334829>
<https://orcid.org/0000-0002-1796-4936>

Dhelfeson Willya Douglas de Oliveira

Ph.D., Department of Dentistry,
Federal University of Jequitinhonha and
Mucuri Valleys (UFVJM)
Diamantina, MG, Brazil
<http://lattes.cnpq.br/2860704725625323>
<https://orcid.org/0000-0002-8628-3122>

Edson da Silva

Ph.D., Diabetes Study Group, Department
of Basic Sciences,
Federal University of Jequitinhonha and
Mucuri Valleys (UFVJM),
Diamantina, MG, Brazil
<http://lattes.cnpq.br/9457578388001171>
<http://orcid.org/0000-0003-0910-7042>

ABSTRACT: The emergence of COVID-19 and the associated pandemic outbreak demonstrated the need to educate and mobilize the public to adopt behaviors for community mitigation. In a context of rapid epidemiological worsening, the use of digital media to access information benefits the population and can contribute to the control of the impact of the COVID-19 pandemic. This study aimed to evaluate the most viewed Brazilian videos on YouTube as a source of information about COVID-19. The quantitative, observational, and cross-sectional study was conducted on YouTube on 04/30/2020, with videos uploaded between 01/01/2020 and 04/30/2020. The descriptor “coronavirus” was used and the first 100 most viewed videos that were recorded in Brazilian Portuguese, related to the topic, unduplicated, and being less than 30 minutes long were selected. Two judges recorded the Uniform Resource Locator (URL) of the videos downloaded from YouTube for data analysis. The 100 videos analyzed showed the following results: 140,027,282 views; 7,201,187 “likes”; 165,624 “dislikes”; 352,541 comments; and a total duration of 12 hours, 28 minutes, and 12 seconds. In terms of content, death was mentioned in 71 videos, and the top

prevention behaviors listed by the U.S. Centers for Disease Control and Prevention were addressed by less than one-third of the videos. Most YouTube videos could do a greater job of disseminating information about COVID-19 prevention behaviors, promoting population adherence. Educating, mobilizing, and engaging the public in adopting and practicing behaviors for community mitigation are differential aspects of successfully addressing the COVID-19 pandemic. Given the need for social distancing, YouTube could play an important role in interaction and communication about COVID-19 and be a significant complementary information strategy to combat the pandemic.

KEYWORDS: COVID-19. Coronavirus. Pandemics. Social media.

O YOUTUBE E SEU PAPEL COMO ESTRATÉGIA COMPLEMENTAR DE INFORMAÇÃO NO ENFRENTAMENTO DA PANDEMIA DE COVID-19

RESUMO: O surgimento da COVID-19 e o consequente início da pandemia mostraram a necessidade de educar e mobilizar o público para adotar comportamentos de mitigação comunitária. Em um contexto de rápido agravamento epidemiológico, a utilização das mídias digitais para o acesso à informação torna-se benéfica para a população e com potencial de favorecer o controle dos efeitos da pandemia de COVID-19. O objetivo do estudo foi avaliar os vídeos brasileiros mais vistos no YouTube como fonte de informação sobre a COVID-19. O estudo observacional, transversal, quantitativo foi realizado no YouTube em 30/04/2020, com vídeos carregados entre 01/01/2020 a 30/04/2020. Foi utilizado o descritor ‘coronavírus’ e selecionados os 100 primeiros vídeos com maior número de visualizações, gravados em português do Brasil, relacionados ao tema, não duplicados e com menos de 30 minutos de duração. Dois avaliadores registraram os localizadores uniformes de recursos (Uniform Resource Locator - URL) dos vídeos, os quais foram descarregados do sítio YouTube para análise de dados. Os 100 vídeos analisados apresentaram os seguintes resultados: 140.027.282 de visualizações; 7.201.187 “gostei”; 165.624 “não gostei”; 352.541 comentários; e duração de 12 horas, 28 minutos e 12 segundos. Em relação ao conteúdo, 71 vídeos mencionaram morte e os principais comportamentos de prevenção listados pelos Centros de Controle e Prevenção de Doenças dos EUA estavam presentes em menos de um terço dos vídeos. A maioria dos vídeos do YouTube poderia contribuir de maneira mais significativa na transmissão das informações relacionadas aos comportamentos de prevenção da COVID-19, contribuindo na adesão da população. A educação, mobilização e engajamento do público na adoção e na prática de comportamentos para mitigação comunitária são aspectos diferenciais que possibilitam o êxito no enfrentamento da pandemia de COVID-19. Considerando a necessidade de distanciamento social, o YouTube apresentou potencial em desempenhar um papel importante na interação e na comunicação sobre a COVID-19, com relevância como estratégia complementar de informação no enfrentamento da pandemia.

PALAVRAS-CHAVE: COVID-19. Coronavírus. Pandemias. Mídias Sociais.

1 | INTRODUCTION

COVID-19, whose etiologic agent is SARS-CoV-2, a new coronavirus, emerged in Wuhan, China, in December 2019 (AL-DMOUR et al., 2020; OBADIMU et al., 2021). In a short time, it became a serious public health problem, and in March 2020, the World Health

Organization (WHO) declared COVID-19 a pandemic (AL-DMOUR et al., 2020; WORLD HEALTH ORGANIZATION, 2020).

The COVID-19 outbreak demonstrated the need for urgent global action given the increasing number of cases and deaths at that time, with each country making local decisions (CHAROENWONG; KWAN; PURSIAINEN, 2020).

Countries have taken several initiatives and strategies to prevent the spread of COVID-19, especially social distancing (AL-DMOUR et al., 2020; BASCH et al, 2020a, 2020b; CHAROENWONG; KWAN; PURSIAINEN, 2020; GOZZI et al, 2020; OH et al, 2021) ; the closure of schools (AL-DMOUR et al, 2020; CHAROENWONG; KWAN; PURSIAINEN, 2020), universities (AL-DMOUR et al., 2020), public places (AL-DMOUR et al, 2020; CHAROENWONG; KWAN; PURSIAINEN, 2020), and nonessential businesses (CHAROENWONG; KWAN; PURSIAINEN, 2020); restrictions on gatherings (AL-DMOUR et al, 2020; CHAROENWONG; KWAN; PURSIAINEN, 2020; GOZZI et al., 2020); mass testing (AL-DMOUR et al., 2020) and tracking of COVID-19 cases (AL-DMOUR et al., 2020; OH et al., 2021); restricted mobility within and between countries (CHAROENWONG; KWAN; PURSIAINEN, 2020; GOZZI et al., 2020; HUNTER et al., 2021; OH et al., 2021); among others.

Issues were raised between the need to reduce the impact of COVID-19 and maintain a functioning economy, highlighting the difficult task of maintaining a balance and minimizing social costs, especially for the most vulnerable populations (HUNTER et al., 2021; OH et al., 2021).

In Brazil, social inequalities combined with political disorganization have contributed to amplifying the negative impacts of COVID-19 and exacerbating the consequences of this pandemic (BAQUI et al., 2021), as well as to its control.

The characteristic of SARS-CoV-2 to be mutable and the emergence of variants that worry the authorities have shown the need to take effective measures to contain the pandemic COVID-19, hence the importance of thinking about efficient and organized mechanisms for the dissemination and implementation of public health measures, such as non-pharmacological measures, vaccination, or health system organization (BAQUI et al., 2021).

Non-pharmacological interventions have become essential during the COVID-19 pandemic. The use of a face mask and social distancing have been and may still be necessary to contain the spread of COVID-19, even after vaccination has begun (GOZZI et al., 2020; KWON et al., 2021; YANG et al., 2021).

Expanding access to health information through digital media and empowering individuals to interpret and use the information can have a positive impact on people's health autonomy and improving population health outcomes (YAMAGUCHI et al., 2020).

A video on YouTube can be understood as an interpretation of a reality, and therefore, it is interesting to observe the knowledge and forces present in discourses, to make

reflections, and to recognize the importance of discourse in the construction of society. In outlining the procedures that control discourse in society, Foucault (2014) emphasizes that the production of discourse is simultaneously controlled, selected, organized, redistributed, and tied into the power rules of social groups in different historical periods.

Social media can affect individuals' behavior. The impact of differences in access to information has influenced the spread of COVID-19 and the use of YouTube videos as a source of useful information can help reduce misinformation and combat irrational, unscientific behavior that is dangerous to human health (AL-DMOUR et al., 2020; GOZZI et al., 2020; OBADIMU et al., 2021).

The content available on YouTube and their communicative dynamics in the context of the COVID-19 pandemic can show us a part of social reality situated in time. Through these videos, we can have a glimpse of which topics interest the population the most or which sources are used the most to obtain information (GIL RAMÍREZ; GÓMEZ DE TRAVESEDO ROJAS; ALMANSA MARTÍNEZ, 2020).

Hence, this study aimed to evaluate the most viewed Brazilian videos on YouTube as a source of information about COVID-19 and identify the presence of preventive behaviors for effective community mitigation in this country.

2 | METHODS

The observational, cross-sectional, quantitative study was conducted on YouTube on 04/30/2020, with videos uploaded between 01/01/2020 and 04/30/2020 (adapted from BASCH et al., 2020b; DA SILVA et al., 2020). The descriptor "coronavirus" was used and the first 100 most viewed videos that were recorded in Portuguese, related to the topic, unduplicated, and being less than 30 minutes long were selected, assuming that users generally do not watch long videos (ABEDIN et al., 2015).

The Uniform Resource Locator (URL) of each video from YouTube was recorded to analyze data on the videos. They were independently evaluated by RLS and MMT. Interjudge agreement was determined using Cohen's Kappa coefficient ($K=0.799$).

The following parameters were recorded for all videos: Date of upload, number of views, "likes" and "dislikes," number of comments, and duration.

This study focused on key preventive behaviors listed by the US Centers for Disease Control and Prevention, mortality and anxiety, symptoms, transmission, and natural history, and other COVID-19 precautions (adapted from Basch et al., 2020b).

Data were analyzed using SPSS software (Statistical Package for Social Sciences, IBM Inc., USA) version 26. Descriptive statistical analyses were performed. The association between categorical variables and the source of videos was tested using the chi-square test (X^2). A significance level of 95% ($p < 0.05$) was used.

This study followed the ethical standards of the YouTube platform (<https://>

www.YouTube.com/yt/copyright/pt-BR/fair-use.html) and the recommendations of Resolution 510/2016 of the Brazilian Health Council, as well as Federal Law No. 12.527/2011. Since the videos were in the public domain and the study did not involve any contact with the people in the videos or the owners of the YouTube channels, submission to the Research Ethics Committee was not required (SALVADOR et al., 2017).

3 | RESULTS

The YouTube search conducted on 04/30/2020 pre-selected 122 videos. Of these, 22 were excluded (7 in English; 15 with more than 30 minutes) and 100 were analyzed, showing the following results: 140,027,282 views; 7,201,187 “likes” and 165,624 “dislikes”; 352,541 comments; and a total duration of 12 hours, 28 minutes, and 12 seconds. Most (n=55) of the 100 videos were uploaded by news agencies (Table 1).

Hand hygiene was the most common prevention behavior recommended in the videos (n=24) and was also the one with most views (n=76,443,705). The other prevention behaviors did not show significant results in the statistical analyses: Avoiding close contact with sick people (n=0); staying home when sick (n=2); covering cough/sneeze with a tissue, throwing the tissue away (n=2); wearing a face mask for protection when caring for sick people (n=0); wearing a face mask to protect others when sick (n=3); cleaning and disinfecting objects and surfaces that are touched heavily (n=1).

A total of 71 videos mentioned death and had a relevant number of 59,363,274 views. In addition, 9 videos suggested anxiety or fear and reached 17,331,179 views on YouTube.

COVID-19 can cause several symptoms that vary from person to person; therefore, the symptoms most addressed in the videos were cough (n=18), shortness of breath (n=15), and fever (n=20). Of these symptoms, videos addressing shortness of breath were the most viewed (n= 56,637,816).

Less than one-third of the videos addressed transmission and the natural history of the disease, addressing modes of transmission (n=17), incubation period (n=6), and treatment (n=29).

Other precautions needed to control transmission of COVID-19 were addressed in less than one-third of the videos: quarantine (n=31), staying home (n=24), limitation of transport (n=8), with staying home reaching the highest number of views with 59,618,744 views.

The content of the videos was classified according to their intention: informative (n=76); personal statement (n=12); advertising (n=2); other (n=10).

	No. of videos that Addressed the topic (N=100) n (%)	Number of views (n=140,027,282) n (%)	Video source and who uploaded them				P
			Healthcare professional (n=5) n (%)	University Academia (n=1) n (%)	News agencies (n=55) n (%)	Others (n=39) n (%)	
Preventive behaviors							
Hand hygiene	24 (24)	76,443,705 (54.6)	1 (20)	0 (0)	6 (10.9)	17 (43.6)	0.003
Avoiding close contact with sick people	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	-
Staying home when sick	2 (2)	3,562,108 (2.5)	1 (20)	0 (0)	0 (0)	1 (2.6)	0.024
Cover cough/sneeze with a tissue; throwing the tissue away	2 (2)	4,038,040 (2.9)	0 (0)	0 (0)	1 (1.8)	1 (2.6)	0.978
Wear a face mask for protection when caring for sick people	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	-
Wearing a face mask to protect others when sick	3 (3)	3,893,101 (2.8)	1 (20)	0 (0)	1 (1.8)	1 (2.6)	0.152
Cleaning and disinfecting objects and surfaces that are heavily touched	1 (1)	68,917 (0.1)	0 (0)	0 (0)	1 (1.8)	0 (0)	0.843
Mortality or fear							
Mentions death	71 (71)	59,363,274 (42.4)	3 (60)	0 (0)	44 (80)	24 (61.5)	0.086
Suggests anxiety or fear	9 (9)	17,331,179 (12.4)	0 (0)	0 (0)	3 (5.5)	6 (15.4)	0.337
Symptoms							
Cough	18 (18)	28,779,565 (20.6)	1 (20)	0 (0)	5 (9.1)	12 (30.8)	0.058
Shortness of breath	15 (15)	56,637,816 (40.4)	1 (20)	0 (0)	5 (9.1)	9 (23.7)	0.262
Fever	20 (20)	29,713,347 (21.2)	3 (60)	0 (0)	5 (9.1)	12 (30.8)	0.007
Transmission and natural history of the disease							
Mode of transmission	17 (17)	29,502,293 (21.1)	2 (40)	0 (0)	7 (12.7)	8 (20.5)	0.372
Incubation period	6 (6)	9,064,343 (6.5)	2 (40)	0 (0)	1 (1.8)	3 (7.7)	0.007
Treatment	29 (29)	36,077,355 (25.8)	1 (20)	0 (0)	15 (27.3)	13 (33.3)	0,791
Other precautions							
Quarantine	31 (31)	36.623.602 (26,2)	1 (20)	0 (0)	14 (25,5)	16 (41,0)	0,340
Stay indoors	24 (24)	59.618.744 (42,6)	2 (40)	0 (0)	11 (20)	11 (28,2)	0,598
Restriction of transport	8 (8)	4.907.228 (3,5)	0 (0)	0 (0)	7 (12,7)	1 (2,6)	0,289

Table 1. Description of the content of 100 YouTube videos about the COVID-19 disease viewed on 04/30/2020 in Phase 1.

Source: Prepared by the authors (2022).

4 | DISCUSSION

The videos in the study sample had more than 140 million views, demonstrating the great potential of YouTube as a tool for health promotion, especially in relation to COVID-19.

As vaccines were not available by the time the videos were collected (04/30/2020), prevention was one of the necessary measures to avoid transmission of COVID-19. Hand

hygiene; avoiding close contact with sick people; staying home when sick; covering cough/sneeze with a tissue, throwing away tissues; wearing a face mask for protection when caring for sick people; wearing a face mask to protect others when sick; cleaning and disinfecting objects and surfaces that are heavily touched were the measures recommended by CDC (BASCH et al., 2020b) at that time.

The discourses contained in YouTube videos need to be carefully analyzed and the relevant information should be recorded. Simple preventive behaviors that do not cost individuals significantly and with a very positive impact on health could have been more encouraged. One example is hand hygiene, which was mentioned in only 24 videos. Other behaviors that depend only on individual behavior, such as avoiding close contact with sick people, staying home when sick, and covering coughs/sneezes with a tissue and throwing the tissue away were also not encouraged enough in the videos.

The high number of cases and, consequently, deaths due to the COVID-19 pandemic worldwide and in Brazil, as well as the occurrence of emotional and psychological changes (TOLEDO; DA SILVA, 2020) justified the evaluation of the topics of mortality and fear in the videos.

It should be noted that besides talking about death, most of the YouTube videos could also make an important contribution to sharing information about COVID-19 prevention behaviors, promoting population adherence. Of the 100 videos analyzed, 71 videos mentioned death, and preventive behaviors were mentioned in less than one-third of the videos.

Each person has different perceptions of COVID-19 disease depending on their individual knowledge. The content of YouTube videos may express different interpretations of patients based on their individual experiences, and professionals' perceptions may also change as explanatory models to explain the disease are developed.

Basch et al (2020b) identified the 100 most viewed YouTube videos uploaded in January 2020 in English and Spanish that had subtitles. Like our study, most videos (85.0%) were submitted by news agencies. Less than one-third of the videos addressed any of the seven prevention behaviors recommended by the CDC. In addition, most videos mentioned death (84.0%). The number of deaths resulting from the COVID-19 pandemic could be reduced by taking appropriate public action to delay the advance of the disease. Planned action makes an important difference in reducing the spread of COVID-19.

Li et al. (2020) conducted a survey on YouTube on March 21, 2020, using the keywords "coronavirus" and "COVID-19" and analyzed the 75 most viewed videos resulting from each search. Videos that were duplicate, non-English language, non-audio, non-visual, longer than 1 hour, live, and unrelated to COVID-19 were excluded. Of the 150 videos viewed, 69 (46%) were included with a total of 257,804,146 views. Nineteen (27.5%) videos contained nonfactual information with a total of 62,042,609 views, that is, more than a quarter of the videos contained misleading information.

Thus, like Li et al. (2020), we observed a considerable reach of YouTube as a form of communication with the public, but a critical view regarding the information about COVID-19 found on YouTube is needed.

Given the need to control the pandemic and prevent the emergence of variants, efficient public policies were and are necessary to contain the pandemic and minimize economic and social losses. In this context, YouTube can be used as a complementary strategy to disseminate information to combat the COVID-19 pandemic.

This study has some limitations. It is a cross-sectional study at a single point in time, such as other studies on YouTube. This social network is a dynamic video platform whose content is renewed daily, which makes the information resulting from this study time sensitive. In this study, only videos available on YouTube in Portuguese were analyzed, since Portuguese is the language spoken in Brazil, where the study was conducted. Finally, studies evaluating the quality and reliability of the information in these videos could provide further relevant information on this topic.

5 | ACKNOWLEDGMENTS

RLS was supported by an institutional grant from the Federal University of Vales do Jequitinhonha e Mucuri (UFVJM).

MMT was supported by a grant from the Coordination for the Improvement of Higher Education Personnel (CAPES).

CONFLICTS OF INTEREST

None declared.

REFERENCES

- ABEDIN, T. *et al.* YouTube as a source of useful information on diabetes foot care. **Diabetes Research and Clinical Practice**, v. 110, n. 1, p. e1-e4, 2015.
- AL-DMOUR, H. *et al.* Influence of social media platforms on public health protection against the COVID-19 pandemic via the mediating effects of public health awareness and behavioral changes: Integrated model. **Journal of Medical Internet Research**, v. 22, n. 8, p. 1–15, 2020.
- BACUI, P. *et al.* Comparing COVID-19 Risk Factors in Brazil Using Machine Learning: The Importance of Socioeconomic, Demographic and Structural Factors. **SSRN Electronic Journal**, p. 1–10, 2021.
- BASCH, C. E. *et al.* The role of YouTube and the entertainment industry in saving lives by educating and mobilizing the public to adopt behaviors for community mitigation of COVID-19: Successive sampling design study. **JMIR Public Health and Surveillance**, v. 6, n. 2, p. 1–6, 2020a.
- BASCH, C. H. *et al.* Preventive behaviors conveyed on YouTube to mitigate transmission of COVID-19: Cross-sectional study. **JMIR Public Health and Surveillance**, v. 6, n. 2, p. 3–8, 2020b.

CHAROENWONG, B.; KWAN, A.; PURSIAINEN, V. Social connections with COVID-19-affected areas increase compliance with mobility restrictions. **Science Advances**, v. 6, n. 47, 2020.

DA SILVA, Edson *et al.* Are YouTube Portuguese videos useful as a source of information on diabetes foot care?/Os vídeos em português do YouTube são úteis como fonte de informações sobre cuidados com o pé diabético? **Brazilian Journal of Development**, v. 6, n. 1, p. 1305-1312, 2020.

FOUCAULT, M. A ordem do discurso: aula inaugural no Collège de France, pronunciada em 2 de dezembro de 1970. Tradução de Laura Fraga de Almeida Sampaio. São Paulo: Edições Loyola, 2014.

GIL RAMÍREZ, M.; GÓMEZ DE TRAVESEDO ROJAS, R.; ALMANSA MARTÍNEZ, A. YouTube y coronavirus: análisis del consumo de vídeos sobre la pandemia COVID-19. **Revista Latina**, n. 78, p. 121–153, 2020.

GOZZI, N. *et al.* Collective Response to Media Coverage of the COVID-19 Pandemic on Reddit and Wikipedia: Mixed-Methods Analysis. **Journal of Medical Internet Research**, v. 22, n. 10, 2020.

HUNTER, R. F. *et al.* Effect of COVID-19 response policies on walking behavior in US cities. **Nature Communications**, v. 12, n. 1, p. 1–9, 2021.

KWON, S. *et al.* Association of social distancing and face mask use with risk of COVID-19. **Nature Communications**, v. 12, n. 1, p. 1–10, 2021.

LI, H. O. Y. *et al.* YouTube as a source of information on COVID-19: A pandemic of misinformation? **BMJ Global Health**, v. 5, n. 5, 2020.

OBADIMU, A. *et al.* Developing a socio-computational approach to examine toxicity propagation and regulation in COVID-19 discourse on YouTube. **Information Processing & Management**, v. 58, n. 5, p. 102660, 2021.

OH, J. *et al.* Mobility restrictions were associated with reductions in COVID-19 incidence early in the pandemic: evidence from a real-time evaluation in 34 countries. **Scientific Reports**, v. 11, n. 1, p. 13717, 2 dez. 2021.

SALVADOR, P. T. C. DE O. *et al.* Segurança do paciente: caracterização de vídeos do YouTube. **Revista Gaúcha de Enfermagem**, v. 38, n. 1, 2017.

TOLEDO MM, DA SILVA E. Mental health and online information during the COVID-19 pandemic. Mental health, information and COVID-19. **InterAm J Med Health** 2020;3:e202003026. DOI: <https://doi.org/10.31005/iajmh.v3i0.108>

WORLD HEALTH ORGANIZATION (WHO). Coronavirus. 2020. Disponível em: <https://www.who.int/health-topics/coronavirus#tab=tab_1>Acesso em: 22 abr. 2020.

YAMAGUCHI, M. U. *et al.* O papel das mídias digitais e da literacia digital na educação não-formal em saúde (The role of digital media and digital literacy in non-formal health education). **Revista Eletrônica de Educação**, v. 14, n. January, p. 3761017, 2020.

YANG, J. *et al.* Despite vaccination, China needs non-pharmaceutical interventions to prevent widespread outbreaks of COVID-19 in 2021. **Nature Human Behaviour**, v. 5, n. 8, p. 1009–1020, 22 ago. 2021.