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INFORMATION AND IMPACTS GENERATED ON SOCIETY BY THE NOVEL CORONAVIRUS 2019-nCoV/SARS-CoV-2

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ABSTRACT

SARS-CoV-2 has been affecting the lives of thousands of people around the world, leading to the death of more than 745,000 people. There is still no effective treatment for this disease it leads to chaos in the public health and economy of the affected countries. Thus, this study aimed to collect information regarding SARS-CoV-2, as well as the impacts generated in society by the novel coronavirus. Thus, a prospective study of a qualitative and cross-sectional nature was carried out, with the searches being carried out between the months of December 2019 to August 2020, this is the period that comprises studies of SARS-CoV-2. The BVS, PubMed and DOAJ databases had the largest number of published studies with 2,506, 1,616 and 914, respectively. The scientific findings show an increasing number of papers with information on symptoms, diagnosis, comorbidities and possible treatments. The impacts recorded in the literature include weakness in health systems, weakening of the world economy, psychological and physical problems in people. Thus, efforts by the whole society, together with public authorities, are needed to develop measures that can resolve social and economic issues while there is no effective treatment for SARS-CoV-2.

INTRODUCTION

In December 2019 there was a series of cases of an atypical acute respiratory disease in Wuhan, China. This disease spread rapidly causing chaos in the health system of the city of Wuhan, where it was only in January 2020 that the etiologic agent responsible for the outbreak was discovered, a novel coronavirus, 2019-nCoV or SARS-CoV-2 (Yuki *et al.*, 2020).

This novel pathogen has similarities with the SARS-CoV that affected the whole of China from 2002-2003, leading to the death of thousands of Chinese (Ksiazek *et al.*, 2020). The 2019-nCoV outbreak began through zoonotic transmission at a seafood market located in Wuhan. Then, local human-to-human transmission was observed, which contributed to the spread of the disease throughout China and the world. (Li *et al.*, 2020). The novel coronavirus has single-stranded RNA

with a positive sense and is part of the CoV family (Lu *et al*., 2020) this is the seventh identified CoV that infects humans and the third strain that can lead to serious respiratory complications, where the other two are, SARS-CoV and MERS-CoV (Mackenzie and Smith, 2020). People infected with SARS-CoV-2 have a series of symptoms, 80% of whom have mild and moderate symptoms or no symptoms (asymptomatic), 15% progress to severe pneumonia and 5% have acute respiratory distress syndrome (ARDS), septic shock and organ failure which can lead to death (Huang *et al*., 2020). According to the Center for Science and Systems Engineering (CSSE) at John Hopkins University, until August 12, 2020, approximately 20,452,313 cases of COVID-19 were confirmed worldwide and a rate of 745,530 deaths (Johns Hopkins University [website] (2020)). Currently, there is no specific treatment for coping with SARS-CoV-2, however, several drugs and therapies are being tested to demonstrate their effectiveness in clinical trials, but none so far has shown effectiveness in treatment (Pacheco *et al*., 2020). Thus, social distance is still the most effective way to contain the rapid spread of the virus, being recommended by the World Health Organization (WHO) and adopted by several countries (Yuki *et al.,* 2020). This study presents a scientific prospecting of published papers on SARS-CoV-2, seeking information that is useful in the social and academic environment, as this health crisis is a public health problem worldwide, affecting more than 200 countries, the USA and Brazil are currently the countries most affected, with 5,187,611 and 3,109,630 confirmed cases, respectively. Where these countries can collapse, especially in their health systems, in addition to economic, social and health problems (Madabhavi *et al*., 2020). Thus, this study aimed to collect information regarding SARS-CoV-2, as well as the impacts generated in society by the novel coronavirus.

MATERIALS AND METHODS

The study followed the method of Araújo *et al*. (2020a) for a prospective study of a qualitative and transversal nature, with analysis of the results collected in the prospective searches in the databases. For the production of this review, the following steps were designated: a) composition of the theme and guiding objective; b) selection of the databases to be used and the search descriptors; c) inclusion and exclusion criteria for studies; d) definition of the information to be used, extracted from studies in the literature; e) evaluation of the information extracted and included in the review; f) clarification of the results applied in the review (Donato and Donato, 2019). The searches were carried out through the databases: Latin American & Caribbean Health Sciences Literature (LILACS), National Center for Biotechnology Information (PubMed), Scientific Electronic Library Online (SciELO), Virtual Health Library (VHL/BVS) , Directory of Open Access Journals (DOAJ) and Portal de Periódicos CAPES (CAPES/MEC). The descriptors used were: "COVID-19 and Impacts", "COVID-19 and Information", "Complication and COVID-19" and "COVID-19 and Fake News" as illustrated in the organization chart in Figure 1. The papers taken into account were just the articles published between the months of December 2019 to August 2020, this is the period that comprises studies of SARS-CoV-2. Searches were concentrated in English (American and British), Portuguese and Spanish.
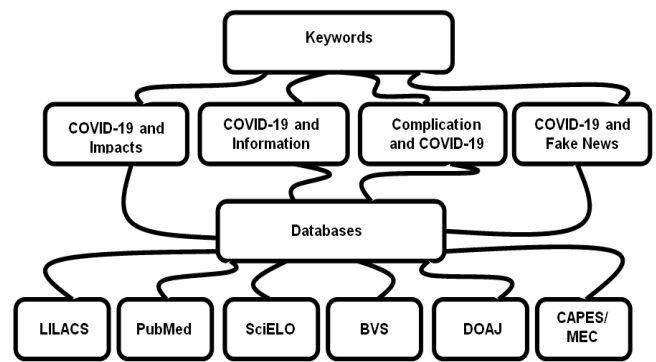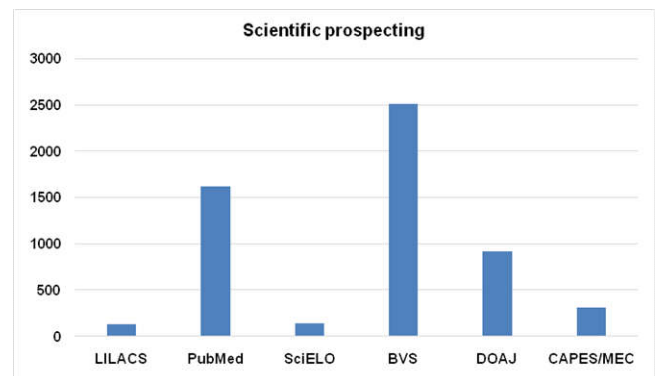

Figure 1. Organization chart of the bases used in scientific research

Graphic 1. Scientific prospecting: total number of findings for each database used in this study

The exclusion criteria included studies in preprint, as they were not evaluated by peers and are not published by a Journal, in addition to papers published in languages contrary to those selected in this study.

RESULTS AND DISCUSSION

Graphic 1 shows the number of scientific findings in the databases used in this study, where the BVS, PubMed and DOAJ databases presented the largest number of studies published with 2,506, 1,616 and 914, respectively. The CAPES/MEC, SciELO and LILACS databases presented the lowest number of results with 309, 140 and 136 publications, respectively. The descriptor "COVID-19 and information" obtained a greater number of findings for all databases in this study, with the exception of the PubMed database, which presented greater findings for the keyword "complication and COVID-19" (Table 1). In particular, the BVS and DOAJ databases, which together presented a total of 2,394 published papers, an expressive number of studies related to this descriptor as available in Table 1. This demonstrates the commitment of the scientific community to bring information about COVID-19 in terms of what this disease can bring to the population, in addition to the impacts generated. As well as, identify the novel coronavirus from study of its genome, genetic sequencing, family, gender, order, symptoms and worsening, among other informational study. Thus, it is possible to outline coping strategies and raise hypotheses in study of inhibition of SARS-CoV-2. The descriptor "COVID-19 and Fake News" presented the lowest number of papers for all databases used in this study.

Table 1. Number of findings for all keywords in the respective databases: LILACS, PubMed, SciELO, BVS, DOAJ and CAPES/MEC.

Keywords	LILACS	PubMed	SciELO	BVS	DOAJ	CAPES/MEC
COVID-19 and Impacts	22	492	44	435	147	88
COVID-19 and Information	110	469	90	1683	711	190
Complication and COVID-19	3	655	2	359	39	25
COVID-19 and Fake News	1	-	4	29	17	6

Symptoms: According to Lima in 2020, the clinical aspect of SARS-CoV-2 infection is extensive, and can range from a simple cold to severe acute pneumonia. Individuals infected by the virus commonly acquire mild respiratory symptoms, persistent fever lasting an average of 5 to 6 days after infection, with the presentation of the severe form of the disease being septic shock and respiratory failure (Chan *et al.,* 2020). In a study conducted in China, the symptoms resulting from the novel coronavirus were observed in 10 children, where 8 had a fever, 6 had a cough, 4 had a sore throat, 4 presented focal pneumonia on CT and none needed supplemental oxygen (Cai *et al.*, 2020). In the case of children, symptomatic infection often appears to be uncommon, often when it occurs it is mild, although serious cases have been mentioned (McIntosh *et al.,* 2020).

Diagnosis: With the advent of the novel coronavirus, diagnostic tests have gained prominence, being important in tracking the spread of the virus (Pan *et al.*, 2020). It is possible to evaluate the condition of people affected by SARS-CoV-2 in a clinical and laboratory manner. In the beginning, the disease is characterized as Flu Syndrome (FS), and its diagnosis of the syndromic condition is analyzed by clinical-epidemiological tests (Silva *et al.,* 2020). The techniques of RT-PCR in real time or rapid serological test are made available by the reference institutions to identify the SARS-CoV-2 virus in the body, this test is considered the gold standard of diagnosis (Baig, 2020). These diagnostic approaches are suggested for any case of Flu syndrome that may present at the APS/ESF, because these places are the gateway to the Brazilian Unified Health System and have an important role in controlling the spread of the disease (Sarti *et al.,* 2020).

Comorbidities: Comorbidities are extremely important factors to be observed in patients confirmed with Covid-19, as they can result in the death of patients (Deng and Peng, 2020). Regarding the influence of adjacent diseases in severe cases of COVI-19, a study by Huang *et al.* (2020) noted that diabetes, hypertension and cardiovascular disease are present in many fatal cases related to the virus. This was also confirmed in studies by Deng and Peng (2020), who found that people who have comorbidities such as hypertension, diabetes, coronary heart disease, cerebral infarction, chronic bronchitis and Parkinson's disease can develop the severe state of the disease.

Call Center (COVID-19): Ordinance No. 467, of March 20, 2020 is exceptional and temporary and provides for telemedicine interventions, aiming to regulate and operationalize the ways to combat the national and international public health emergency arising from COVID-19. As a strategy tool to face this disease, the Ministry of Health created TeleSUS (https://coronavirus.saude.gov.br/telesus), a extensive pre-clinical health consultation service. The same aims to inform the population, clarify doubts and provide guidance on when the face-to-face service will be needed. It also has the function of contributing to the home isolation of the population at risk and of the contaminated people, as well as contributing to avoiding greater wear and tear in the health system with face-to-face assistance (Fernandes *et al.,* 2020). This innovative method developed by the Ministry of Health of Brazil is essential, as the high ease of spreading the virus in different environments makes the telehealth service a fundamental strategy that allows the user to have access to quality and individual information for each case (Dorsey *et al.,* 2020).

Treatment: Currently, there are no drugs for the treatment of SARS-CoV-2 (Pacheco *et al.*, 2020). However, the need for an emergency treatment alternative is fundamental in coping with the disease. Thus, several clinical studies are being carried out, the most researched being the drug repositioning technique (Marra *et al.,* 2020). In this perspective, antiviral drugs such as remdesivir, atazanavir, rimantadine and umifenovir, together with ivermectin and nitazoxanide and interleukin-6 inhibitors (tocilizumab) have shown *in vitro* action against SARS-CoV-2 in preliminary results, and depend on *in vivo* tests to assess their viability and clinical studies are needed with the use of these drugs (Tang *et al.*, 2020a; Araújo *et al.*, 2020b). Another medication that was being widely used in research for drug repositioning, is hydroxychloroquine (Pacheco *et al.*, 2020). A recent multicenter, randomized controlled study involved 150 patients infected with SARS-CoV-2, divided into two target groups, the first target group was treated with hydroxychloroquine, and the second group did not receive the drug. Through this, it was possible to observe that there was no difference between the two target groups, being reported that there is no efficacy in the use of hydroxychloroquine in the treatment of COVID-19, as it did not present clinical evolution in relation to patients who did not receive the drug as treatment (Borba *et al.,* 2020). In line with these results, another study show the ineffectiveness of hydroxychloroquine in the treatment of COVID-19 in study by Tang *et al.* (2020b), in which 90 people tested positive for SARS-CoV-2, where they were treated with hydroxychloroquine and presented no improvement in their clinical condition, in addition to showing signs that it could increase the risk of prolonging the interval QT, becoming lethal in some cases.

Case study: A study carried out at Changshun People's County Hospital on February 5, 2020, was possible to detect intestinal changes in a 24-year-old patient with COVID-19 using computed tomography (CT). He had abdominal pain and diarrhea (three times during the day), mild cough and runny nose. He did not report a previous history of chronic diarrhea or inflammatory bowel disease. Days later, he was transferred to Jiangjunshan Hospital in Guizhou Province, where he felt pain in his upper abdomen. Then further CT scans of the chest and upper abdomen were performed. Chest CT scan showed small irregular ground-glass opacities in the lower left lobe. CT scan of the upper abdomen that showed no improvement indicated intestinal edema in the distal region of the ascending colon, transverse colon and proximal colon in the descending colon (Tang *et al.*, 2020a).

Collapse in the health system: The novel coronavirus appeared in late December 2019 in Wuhan, China, and spread

rapidly around the world becoming an international public health case (Araújo *et al.,* 2020a). According to the Johns Hopkins University School of Medicine (https://coronavirus.jhu.edu/map.html), as of August 12, 2020, the virus has infected 20,452,313 people worldwide, leading to 745,530 deaths, generating numerous problems, one of which is the collapse in the health system of countries with high numbers of cases (Madabhavi *et al.,* 2020). As can be seen in Italy, where the healthcare system collapsed with the diagnosis of thousands of people with COVID-19 in a short period of time. The country found itself weakened by the high number of people hospitalized for SARS-CoV-2, leading to the death of over 35,225 Italians to date (Riboli *et al.,* 2020). A technical study carried out in Brazil was designed on the number of beds occupied by people with COVID-19 in the Intensive Care Units (ICU) offered by the Sistema Único de Saúde (SUS). Using data from the year 2019, a scenario was simulated, in which 20% of the population would be infected with SARS-CoV-2, with 5% of individuals needing to stay in ICUs for 5 days. The results show that of the 436 health regions in Brazil 67.4% would exceed the occupancy rate of 100%. The study also pointed out that an infection rate of 9% would be enough for ICU beds to be occupied in half of Brazil's health regions (Rafael *et al.,* 2020).

In view of the impossibility of total and immediate containment of the pandemic, the experiences acquired by the world point out that it is necessary to control the progress of the disease through measures of social isolation. This method contributes to reducing the need for ventilatory support and hospitalization in ICUs that would soon be occupied, adjusting the ability to provide assistance through the health system (Rafael *et al.,* 2020).

Social inequality: The divergences in wealth between classes and individuals may reflect on health indexes, showing a greater degree of severity, especially in certain infectious diseases. This scenario offers a reflection on the seriousness of the impacts that the pandemic may have on the poorest communities in underdeveloped countries, where most people do not have access to treated water, sanitation, structure and income that contribute to the adoption of preventive methods (Sousa, 2020). In the same sense, a study found that thousands of people live in immigrant camps in the Mediterranean. This location has less than ideal infrastructure capacity to accommodate these people, as well, the environment is unfavorable to good hygiene, thus making it a great risk for the spread of SARS-CoV-2 (Hargreaves *et al.,* 2020). Governmental measures are reinforced at all times, in view of the need for social distance actions, which is a WHO recommendation to all countries. However, there are countries with high socioeconomic vulnerability that make it impossible to carry out social isolation for a long time, as this would cause the death of thousands of people due to hunger and other types of illness aggravated by the terrible living conditions experienced by these individuals, there is an example of immigrants, who are displaced from their homes and it is out of their reality to fulfill social isolation (Hargreaves *et al.,* 2020).

Fake News: As the events went on, many news items were published on social networks and consequently seen by a large part of the population, even though many of them were false. As a result, the Brazilian Ministry of Health detained many of this false news reports and classified them as "Fake News",

and stressed that misleading information can lead to complications in the fight against COVID-19 (Neto *et al.,* 2020). Like the SARS-CoV-2 virus, the spread of false news occurs in parallel, harming government actions to confront COVID-19, where numerous false news are shared with the population (Neto *et al.,* 2020).

Mental health: Mental health care increases during a crisis of social severity (Faro *et al.,* 2020). The novel coronavirus pandemic can be classified as a crisis that has been characterized as an international public health problem of the last decades (Schmidt *et al.,* 2020). This event promotes psychological and social disturbances that interfere with how to deal with a health crisis, and therefore measures to combat the psychological implications of the pandemic should not be overlooked (Brooks *et al.,* 2020). A survey of 1,257 Chinese health professionals, nurses and doctors, revealed depressive symptoms in many of the professionals. They also showed symptoms of anxiety, insomnia and distress. Many of these symptoms were, mostly in female nurses in the city of Wuhan, China, and other professionals who took care of clinical diagnoses, treatment and care for individuals suspected or confirmed with SARS-CoV-2 (Lai *et al.,* 2020). Despite this, the area of psychology and the like, who research on mental health has taken emergency actions to present alternatives to deal with this disease and ways to deal with emotional crises in the context of pandemics and mental health crises (Faro *et al.,* 2020).

Physical problems: The increase in the number of new cases of COVID-19 led government agencies to adopt measures of social distance and suspension of several economic activities, where thousands of people stayed in their homes, having to rehabilitate new physical and dietary habits (Aquino *et al.,* 2020). These measures directly influence a lifestyle that favors the increase in physical inactivity and the appearance of small musculoskeletal changes, either due to the overload of work that has been done at home or the lack of physical exercises in addition to long periods of rest and maintenance of the same position for hours, such as sitting and lying (Yadav *et al.,* 2020). In Brazil, the ConVid - Behavioral Research project, carried out by the Fundação Oswaldo Cruz (Fiocruz), in partnership with Universidade Federal de Minas Gerais (UFMG) and the Universidade Estadual de Campinas (UNICAMP), aimed to verify how the social isolation resulting from the pandemic of the novel coronavirus affects or changes the life of the Brazilian population. This analysis was carried out from April 24 to May 8, 2020, with a total of 43,062 participants. It was found that individuals who have a chronic spine problem, 50% reported increased pain, and for those who do not have a spine problem before the pandemic, more than 40% started to have spine pain due to changes in their usual activities (Fundação Oswaldo Cruz [website] (2020)).

Economy: The spread of SARS-CoV-2 has gradual consequences of which a major economic depression is part. Economically, countries hit unexpectedly by a disease can suffer from a decline in economic activities in general (Açikgöz, and Günay, 2020). The problem is revealed by the fall in stock prices in New York, from February to March, this occurred in line with the great economic slowdown of several countries such as Germany, Japan, China and the United States (Dantas, 2020). Nevertheless, the United Nations Conference on Trade and Development (UNCTAD) reported that the novel

coronavirus is likely to cost at least $ 2 trillion in 2020 for the global economy (Açikgöz, and Günay, 2020). Despite this, assuming the economic costs that the pandemic may cause in the world is still uncertain, as it has spiral effects on both national and global economies, meaning that any economic change that may happen in one country will consequently affect others (Lee *et al.*, 2004).

FINAL CONSIDERATIONS

The pandemic of the novel coronavirus brought problems in different segments of society, in which it is still in the process of spreading in countries and, without an effective drug to treat it. The scientific findings presented in this study show an increasing number of papers with information on symptoms, diagnosis, comorbidities and possible treatments for SARS-CoV-2. We also highlight Fake News that has also intensified, causing problems in the disclosure of true information. The impacts recorded in the literature include weakness in health systems, weakening of the world economy, psychological and physical problems in people. Thus, efforts by the whole society, together with public authorities, are needed to develop measures that can resolve social and economic issues while there is no effective treatment for SARS-CoV-2.

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