COVID-19 in the working environment and its consequences on the health of workers

Covid-19 no ambiente de trabalho e suas consequências à saúde dos trabalhadores

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DOI: 10.1590/0103-11042021E208I

ABSTRACT This study showed the consequences of the new Coronavirus in the working environment and its effects on workers' health. SARS-CoV-2 has a high transmission level through exhaled droplets, affecting organs such as the lungs, heart, liver, kidneys, and brain. Productive and social activities were interrupted, but many continued to operate due to market pressure. Health professionals are among the most exposed, but activities requiring many people in the same environment are at substantial risk of exposure to Coronavirus. Work can favor and accelerate the destruction caused by the virus. Inadequate economic and social policies contributed to the deterioration of the health crisis, increasing the economic and social crisis, marked by the loss of jobs and increased work instability. Control and prevention measures are required to reduce risk, but they should consider the nature of relationships in the work and social environment. Social isolation, hand hygiene, and masks are recommended measures, besides Personal Protective Equipment and collective measures for workers. The impact of the pandemic marks every worker involved. Several stressors arise or deteriorate, psychologically affecting many employees. Returning to work with adequate planning requires safety to minimize risks and protect workers.

KEYWORDS COVID-19. Working environment. Occupational health. Safety. Return to work.

RESUMO *Este trabalho apresentou as consequências do novo coronavírus no ambiente de trabalho e reflexos na saúde do trabalhador. O Sars-CoV-2 possui elevado nível de transmissão pelas gotículas exaladas, afetando órgãos como pulmões, coração, fígado, rins e cérebro. Atividades produtivas e sociais foram interrompidas, mas muitas seguiram operando por pressão do mercado. Profissionais da saúde estão entre os mais expostos, porém atividades que exigem grande número de pessoas no mesmo ambiente se encontram sob risco elevado de exposição ao novo coronavírus. O trabalho pode favorecer e acelerar a destruição causada pelo vírus. Políticas econômicas e sociais inadequadas contribuíram para agravamento da crise sanitária, aumentando a crise econômica e social, marcada pela perda de postos de trabalho e aumento da precarização do trabalho. Controles e medidas de prevenção são necessários para a redução de risco, mas precisam contemplar a natureza das relações no ambiente de trabalho e sociais. Isolamento social, higienização das mãos e uso de máscaras são providências recomendadas, além de Equipamentos de Proteção Individual e medidas coletivas para trabalhadores. O impacto da pandemia marca cada trabalhador envolvido, diversos estressores surgem ou se agravam, afetando psicologicamente muitos funcionários. O retorno ao trabalho com planejamento adequado requer segurança para minimizar riscos e proteger os trabalhadores.*

PALAVRAS-CHAVE *Covid-19. Ambiente de trabalho. Saúde do trabalhador. Segurança. Retorno ao trabalho.*

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Introduction

The World Health Organization (WHO) declared the COVID-19 (SARS-CoV-2) pandemic in March 2020. This declaration meant that the COVID-19 infectious disease had spread across continents in a sustained way[1]. Contrary to what was previously thought, the new Coronavirus causes greater and longer-lasting harmful effects on human health, which remain after the end of the acute phase of the disease[2].

The different transmission routes of the new Coronavirus must be further investigated and identified so that interventions that can break the chain of transmission can be planned since SARS-CoV-2 stands out for its high transmissibility, especially among people with remarkably close physical distance, through exhaled droplets[3].

This virus can only be contained through social distancing measures, interrupting several productive and social activities, significantly impacting the economy. However, several economic activities continued to operate, not just the essential ones, due to market pressure. Thus, several categories of workers ended up even more exposed and sick[4].

This context has set the return to work with proper planning as a global concern. Companies require a thorough return plan designed by trained professionals. In general, work environments are closed, air-conditioned, or with insufficient ventilation, facilitating crowding, situations that favor virus transmission. Therefore, work resumption is a challenge. It must be accompanied by safety measures that minimize risks and protect workers on their return[5].

The exposure level of some professionals is higher due to the nature of the work environments and processes[6]. Healthcare professionals are among the most exposed groups, given their direct work with patients infected with SARS-CoV-2[7]. Likewise, other categories, such as telemarketing attendants, slaughterhouse, and factory workers, who gather in the same environment due to the work process, are at significant risk of exposure to the new Coronavirus[8,9].

Besides behaviors recommended to the population, such as hand hygiene, workers require other protective means due to their activities. In these cases, Brazilian legislation requires employers to develop Worker Protection Programs. Adopting Personal Protective Equipment (PPE) and collective protection measures should support risk control measures[10,11].

However, the pandemic caused significant job losses, raising the level of informality and reaching with greater intensity those who already lived in work instability[2]. Thus, activities that lack direct contact with the population, such as general services, commerce, transport, and deliveries, including digital platforms, establish a twin-track contagion risk since they can reach the population served and the workers of these services. On the other hand, these individuals play an essential role in society, even at the expense of greater exposure to the virus[13]. Consequently, 'return to work' did not occur as this population could not stop working.

Work can favor and accelerate the destruction caused by the new Coronavirus. However, the overlap of several external factors causes the pandemic to hit the world of work more deeply, with a high life destruction power, especially among the poorest and most vulnerable. In this sense, government actions are crucial to ensure workers' protection and survival. Thus, monitoring and prevention and surveillance measures are required to reduce risk[14]. Other illnesses, such as mental health, can also affect workers[6]. Hence, work plays a vital role in mitigating COVID-19 through the working and living conditions provided.

This essay aimed to show how COVID-19 can spread in the work environment and bring short and long-term consequences

for workers' health. Thus, the following themes limited the composition of this paper: What are the known effects of the new Coronavirus on human health? How does the transmission and propagation of this virus occur in the work environment? Are there measures to mitigate worker exposure to SARS-CoV-2 in the work environment? Can only the population working in essential activities be considered exposed? Is it possible to protect workers without changing work processes and environments in face-to-face mode during the pandemic? This paper aimed to address the work environment and workers' health in the COVID-19 pandemic pragmatically, highlighting the magnitude of the disease and the need to strengthen preventive measures and adequate public policies for the effective confrontation of the new Coronavirus.

Methodological aspects

This essay employed secondary information from publicly available sources to generate the essential data. The bibliographic survey used the literature review on national and international scientific production regarding the relationship between the COVID-19 pandemic and worker's health. The search period was from 2020 to 2021 in Portuguese, Spanish, and English in the databases of the Scientific Electronic Library Online (SciELO), Latin American and Caribbean Literature on Health Sciences (LILACS), PubMed, Google Scholar, and Google, besides publications by FIOCRUZ-COVID, Centers for Disease Control and Prevention (CDC), World Health Organization (WHO), International Labor Organization (ILO), Occupational Safety and Health Administration (OSHA), and the Brazilian Ministry of Health and Ministry of Economy. The descriptors (translated from Portuguese) used were: "New Coronavirus", "SARS-CoV-2", "COVID-19", "Work", "Worker", "Work environment", "Health effects", "Transmission", "Occupational exposure", "Control measures", and "Public policies". The selected papers were analyzed to identify the essay's main objects. Then, the conceptual framework was established, setting categories around relevant points for discussion to support public policies for the prevention and control of the pandemic in Brazil.

The pandemic and its effects on human health

All the possible effects caused by COVID-19 are hardly known. However, the considerable number of global cases in approximately 22 months already allows the knowledge of prevalent effects in this time bracket.

The infection induced by COVID-19 can cause lung, kidney, heart, and circulatory damage, besides damage to the nervous system[15]. The most reported symptoms of this disease in the literature are fever, cough or chest tightness, dyspnea, headache, myalgia, anosmia, and ageusia[16]. However, acute conjunctivitis, nasal congestion, and sore throat are also frequent signs of virus contact sites at the outset of the disease[17]. Moreover, SARS-CoV-2 was found in the conjunctival secretions of patients with conjunctivitis, characterizing ocular transmission as a possible route[16,18].

One of the effects of Covid-19 is acute pneumonia. Most patients with fever, dry cough, and dyspnea have bilateral opacity on chest computed tomography scan, with signs and symptoms located in the lower airways. However, SARS-CoV-2 is not limited to the respiratory tract, as it can also cause neurological diseases[15,19], which include symptoms related to the central nervous system, peripheral nervous system, and musculoskeletal injuries[20].

Likewise, acute cerebrovascular disease, especially cerebrovascular accidents (CVA),

has also emerged as a significant complication. CVA patients presenting vascular events related to a pro-inflammatory hypercoagulable state have also been reported. Several patients had cerebrovascular events, such as ischemic strokes, intracerebral hemorrhages, and central nervous system vasculitis[21].

COVID-19 infection can cause acute kidney injury[22,23]. Patients with chronic kidney disease and kidney transplantation, and those on continuous renal replacement therapy, are more susceptible to developing COVID-19[22] infection.

This disease can also give rise to considerable cardiovascular damage due to the aggravation of pre-existing conditions, as well as inflammation-driven acute events, such as inflammatory heart disease/ischemia, ventricular arrhythmias, intraventricular conduction disorders, thrombi in the lungs, and the coagulation cascade systemic activation, allowing the dissemination of intravascular coagulation[24].

Research has found that a hypercoagulable state is also associated with COVID-19. Initial data suggest high rates of thromboembolism and localized pulmonary microvascular thrombosis, which may be necessary for progressive respiratory failure[25,26]. Venous and arterial micro and macrothrombosis are common COVID-19 manifestations. Venous thromboembolism is the most common complication, affecting the most severe patients[27].

Pregnant women, fetuses, and newborns may also be more susceptible to SARS-CoV-2. However, to date, the results are controversial, as they have not been able to confirm the associations between the new Coronavirus and different neonatal complications and those that occur in pregnancies[28-30].

The medium and long-term effects of COVID-19 have been confirmed. Patients with the disease also had the post-intensive care syndrome, previously well described in other critically ill patients. However, persistent medium and long-term sequelae have also been observed in non-hospitalized patients with mild and moderate COVID-19 and children[31,32].

What are the primary forms of transmission and spread of the new Coronavirus?

As it is a respiratory virus, there is a consensus that this spread occurs mainly through atmospheric air. All infected people, including asymptomatic ones, can transmit the virus through exhaled air[33]. The new Coronavirus is transmitted primarily by infected secretions, such as saliva, mucus, and respiratory droplets formed by aerosols smaller than 5 ×m in diameter, between individuals with a physical distance of less than 2 m. Therefore, airways are decisively crucial in person-to-person infection. The potential for these aerosols to remain in the air longer is more significant. After depositing on different surfaces, SARS-CoV-2 can survive for periods ranging from hours to a few days. For example, the virus can remain viable for infection for up to 72 hours on plastics and stainless steel. However, hand washing and regular cleaning of surfaces with disinfectants reduce the possible transmission of this virus via this route[34].

Transmission can occur through contact between people through coughing, sneezing, talking, and singing. Thus, contaminated aerosols can reach a susceptible individual's mouth, nose, and eyes, resulting in infection. Likewise, direct contact with a contaminated object or surface is also possible. Other transmission routes, such as urine, feces, vertical transmission, and neonatal infection, have not been confirmed[35,36].

Closed places are associated with the spread of infectious diseases. It is no

different with the new Coronavirus. Most contagions occur indoors, involving more than three people and transmission through the air. Thus, the control of aerosols inside the enclosures is decisive to reduce their air transmission, which can be achieved with masks and physical distancing, besides engineering measures such as greater ventilation and better filtration[37]. However, crowding facilitates transmission, regardless of whether it is an open or closed place. The probability of contamination in an open-air crowding, with the recommended distance, is much lower than in a closed and poorly ventilated environment, even obeying the two-meter distance[38].

Is it possible to curb the spread of SARS-CoV-2 in the workplace?

Addressing the COVID-19 health emergency imposes some challenges. Institutions have a long way to learn in organizing their work processes to guide their entire workforce adequately. One of the challenges for institutions and professionals is mitigating workers' exposure to the new Coronavirus and the resulting pathologies since, so far, the published research is from small studies susceptible to biases and confounding factors. Thus, more research on the risk of occupational exposure to SARS-CoV-2 and related diseases is required to establish evidence strong enough to establish clear policies for preventing and controlling the disease[39].

Preventive measures for COVID-19 – such as criteria for remote work, restricted entry to the workplace, physical distancing, routine screening, isolation of infected people, tracking and quarantining of contacts, frequent disinfection of the workplace (especially excessive-contact surfaces), hand hygiene, environmental monitoring and proper use of PPE – are backed by scientific evidence[40] and WHO[39] and ILO[41] recommendations.

The use of PPEs is the last workers' protection measure. Employers must adopt collective and administrative measures to reduce exposure[42] before use. PPEs are recognized as palliative and secondary safety measures, recommended hierarchically in Regulatory Standard 01 – General Provisions and Risk Management, updated by SEPRT Ordinance No. 6.730, of March 9, 2020[43].

Employers must provide activity-specific PPE. In the case of the new Coronavirus, the recommended respiratory protector is PFF2/N95. In the absence of access to the PFF2/N95 mask, combined with low exposure, masks for non-professional use can be employed to reduce the risk of contamination[44]. While fabric masks are not considered PPE, they function as physical barriers, reducing the spread of the virus and, consequently, exposure and risk of infections. However, this group includes distinct types of fabric, such as cotton and synthetic materials, whose efficiencies ranged from 15% to 70%, according to a survey conducted with several models sold in the country. In the same study, surgical masks and those of the PFF2/N95 type achieved 90% to 98% filtration of aerosol particles[45].

As non-professional face masks reduce the incidence of infections, small measures like this have a significant impact on reducing transmission. The results will be even better if such actions are combined with complementary preventive measures, such as hand hygiene and adopting respiratory hygiene measures when coughing or sneezing, avoiding touching the mucous membranes of the eyes, nose, and mouth, and performing hand hygiene with soap and water or 70% alcohol preparation.

We should say that the minimum one-meter distance between people should be maintained even with a mask, and some situations must be observed in the use,

cleaning, and disposal of fabric masks. Likewise, using a mask does not mean that the other recommended hygiene measures can be abandoned. Therefore, everyone should follow the set of hygiene measures already established[44].

The use of gloves is not recommended since the contamination of the worker does not occur through the hands, but the contact of hands with mucous membranes, respiratory droplets, or aerosols produced by other individuals. Therefore, frequent hand hygiene is the most appropriate method. Gloves are more effective in preventing contamination of health professionals and reducing the transmission of microorganisms in care procedures[46,47].

Work environment hygiene must occur whenever there is a possibility of aerosol sedimentation or contact with several people. Disinfection tunnels or the application of disinfectants on workers are not recommended[42]. Studies have shown that common household disinfectants such as soap or bleach solution can inactivate the virus on surfaces, requiring only 10 minutes of contact. Thus, antiseptic products that dry in a shorter time are not efficient[48].

Low-cost and straightforward measures can prevent the virus spread, thus ensuring protection from workers to consumers. Regular cleaning of surfaces and objects with disinfectants, distributing dispensers with 70% alcohol gel for cleaning hands, and encouraging hand washing and respiratory hygiene through posters distributed by the company are some of these measures, which, combined with other communication measures, such as guidance for occupational safety and health officials, instructions in meetings and information on the intranet to promote handwashing reduce the spread of SARS-CoV-2. Likewise, access to places for washing hands with soap and water and access to masks and tissues must be guaranteed[42].

The removal of workers, family, and friends from their workplaces, with the guidance to remain in quarantine for 14 days in the case of suspected COVID-19, is a consensus among national and international organizations. The return to work must be based on the precautionary principle established by the WHO, in which the release of isolation can only occur after two negative tests (RT-PCR) within a 24h-interval. Should the test not be possible, the individuals must remain isolated for two more weeks after the end of the symptoms since they can continue to spread the virus[49].

COVID-19 and the health of workers

The relationship between the pandemic and work is very intense, as work can favor and accelerate the destruction caused by the COVID-19 virus. The disorderly overlapping of political, social, economic, and biological determinants makes the pandemic deeply affect the world of work. It is a vicious circle of increasing speed and high life-destructing power, especially in the poorest and most vulnerable lives. On the other hand, the balance between protecting workers and guaranteeing their survival shows the need for coordinated government actions that allow this stability[14].

Many workers remained in face-to-face activities to provide essential services, such as electricity, drinking water, food, health, and funeral services[38]. The working population of essential activities and those unable to remain in remote work were the most affected by the disease. Other essential occupations, such as supermarkets, pharmacies, and deliveries, are also exposed to the risk of contamination and illness[50]. In some sectors, the risk of transmission is increased for domestic, cleaning, education, meat processing, hospitality, public safety, construction, and social service workers[39]. Unexpectedly, many workers saw their profession become 'at risk' for the new Coronavirus; they are also public and

private transport professionals. However, those who work directly with infected patients, such as health workers, are the most affected[51]. COVID-19 outbreaks are more likely to occur in workplaces with higher concentrations of people and direct physical contact. Environmental conditions such as inadequate ventilation, shared accommodation, food consumption areas, and means of mass transport deteriorate this situation[39].

According to the Ministry of Health, in its epidemiological bulletins on the new Coronavirus – N44[52] and N59[53] – 24.5% among the 2,139,242 Influenza Syndrome (IS) cases in health professionals, notified as suspected of COVID-19 until April 19, 2021, (including 53 epidemiological weeks from 2020 and 15 from 2021), were confirmed. Nursing technicians and assistants (172,069; 32.8%), followed by nurses (80,864; 15.4%), doctors (57,698; 11.0%), and community health workers (26,822; 5.1%) appeared among the workers with the highest number of confirmed IS cases by COVID-19.

Mining activity was also included in the list of essential activities and continued as if the pandemic did not exist without following exposure protocols. Workers are exposed to the virus, as are their families[54]. Another segment is the call center, a sector whose entire work could be conducted from home. A study in South Korea found 44% of call center workers with SARS-CoV-2, showing how the new Coronavirus can be highly contagious in a crowded office[8]. Likewise, workers in the slaughtering and meat processing, meatpacking, and dairy industries are at considerable risk of exposure to the new Coronavirus[9]. Several slaughterhouses suspended their activities in the second quarter of 2020, impacting food production and export due to COVID-19 outbreaks at their facilities. Considering this, the Federal Government published Ordinance No. 19/2020, with prevention and control measures for the transmission of the disease. However, this ordinance contains many measures in common with the good practices and self-control programs already necessary for this industry. Thus, although it improves the provisions already existing in these programs for a food production environment, there should be no difficulties for the sector to adapt to the new reality[55].

On the other hand, most oil and gas sector activities have a low or medium risk of exposure to SARS-CoV-2. Those tasks that do not require close and frequent contact between workers, and activities performed in restricted places, without contact with other people, are considered a negligible risk. However, close and regular contact with colleagues in confined areas elevates the risk level to medium. Moreover, transporting workers to oil platforms leverages the risk of exposure, increasing the possibility of contagion[56].

Researchers at the Alberto Luiz Coimbra Institute of Graduate Studies and Engineering Research (COPPE) at the Federal University of Rio de Janeiro (UFRJ) mapped the risk index of contamination of Brazilian workers by the new Coronavirus per their professional activity. The survey identified a risk of contagion above 50% for health professionals, among which are oral health technicians, with 100% risk, due to the work environment and physical proximity to patients. Likewise, retailers, cashiers, and other trade professionals have, on average, a 53% risk of being infected. The risk is also high, above 70%, for bus drivers and teachers. However, professionals in the artistic and intellectual sector, such as screenwriters, writers and poets, workers in specific activities, who work in rural areas, and chainsaw operators, have a risk of contagion lower than 20% because they carry out more 'solitary' activities[57].

Recognizing COVID-19 as a work-related disease is justified by the increased risk, given the need to maintain so-called essential activities during the pandemic. Some arguments, among others, support

this thesis, such as asymptomatic infected people can transmit without knowing it, the use of necessary control measures may not be possible, and work outside the home is done out of necessity and not willingly. The measures taken by governments to contain the spread of the virus do not meet the population's needs. Therefore, it can be said that COVID-19, which affects people in face-to-face work, is probably a work-related disease. By revoking Provisional Measure No. 927, the Federal Supreme Court confirmed that cases of contamination by the new Coronavirus are considered occupational, without the need to prove the causal link.

Likewise, another important measure was the repeal of Provisional Measure No. 905/19, which abolished the accident *in itinere*, whose consequence is the presumption of a causal link in the case of contamination during the commute to work. The recognition of COVID-19 as an occupational disease allows admitting that the illness originated at work, regardless of the employment relationship, to ensure the workers' rights[58]. Joint Ordinances nº 19 and nº 20/2020 enacted by the Federal Government address measures to prevent and control the risk of COVID-19 transmission in workplaces. However, they contain technical errors and severe failures, with some measurements without a scientific basis. Such ordinances put the lives and health of workers at risk, especially those in the slaughtering and processing industry for meat and dairy products intended for human consumption and dairy products, the object of Joint Ordinance No. 19, besides defending the employer sector's interests[59].

The distribution of illness and death by COVID-19 shows that social determinants, such as ethnicity, gender, and social class, overlap, after analyzing the differences related to age, occupation, education, and work instability, to the increase and losses of informal work. During the pandemic, the vulnerability pattern followed the Brazilian society's structural inequalities, with Black people and women, particularly Black women, being the most affected in the world of work, as they are in lower purchasing power socioeconomic groups, with limited access to health services or without social protection. Black people represent most of the informality, while Black women primarily provide domestic services, whose activities were significantly affected[60].

Inadequate economic and social policies exacerbated the health crisis, increasing the economic and social crisis, marked by the loss of jobs and increased work instability[14]. In Brazil, the pandemic coincided with workers accumulating significant social security and labor rights losses, besides pre-existing work and social inequalities, such as low wages and substandard housing conditions, respectively[38,50].

Social policies adopted, such as emergency aid, could ensure some protection to lower purchasing power workers. Furthermore, the poor management and planning of actions to realize access to payments generated distortions. Difficulties and irregularities in registrations and receipts, denial of access to the aid due to managerial criteria, slow-release, irregular payments, deviations, and scams in the system hindered the assurance of minimal dignity and deterrence from exposure to the new Coronavirus[14,61].

In this pandemic, the composition of the working society shows significant inequalities regarding the risks of exposure in the different professional categories. Controls and prevention, and surveillance measures are essential for risk reduction[50]. However, this precaution and disease control should consider the nature of relationships in the work and social environments, besides home conditions. On the other hand, social distancing is the principal measure to weaken the virus spread, which is restricted to groups in a more socially stable situation,

with social security or labor protection[14,62]. Thus, work assumes a fundamental role in mitigating COVID-19 through the working conditions offered and life situations allowed.

Social distancing and other preventive measures do not work separately from a broader context, in which political will and the structuring of the State are fundamental. René Mendes signals the challenge of facing the COVID-19 pandemic in Brazil by saying:

> Public policies of the Brazilian State have been as virulent and devastating as the SARS-CoV-2 virus in the management of the health crisis and, mainly, in the social and economic crisis. Mitigation measures are insufficient, unfair, and highly discriminatory, to the detriment of informal, unemployed, discouraged, and disabled workers[14(164)].

It is also worth noting that strategic inputs for society, such as electricity, gas, water, and sewage, were brutally burdened at a time of greatest need. Thus, the capital was once again favored due to the lack of regulation, using remote work, in which the worker had high expenses and greater electricity consumption, while employers were graced with lower operating costs[50]. Although this change seems to favor workers, as it allows greater proximity to the family and more protection against COVID-19, this new type of work has produced different burdens for workers and their families since abrupt and unplanned remote work affected the legal and normative aspects and domestic routines, whose private environment became public, accessible to the outside world. One of the consequences is the higher workload due to the introduction of electronic tools and platforms necessary for external connection. Likewise, remote workers' response speed is directly higher, with performance and control rates that progressively increase the work, which can cause problems, especially in mental health[63].

In Brazil, more than 24 million workers could not telework from their homes owing to they were informal or self-employed. Among those 8 million in remote work, 30% had college and graduate degrees, while very low-educated individuals comprised just 0.3% of workers who could work from home. Thus, teleworking is a possibility for few, as it is necessary to have resources to stay at home. There is a need for space, a place for isolation, facilities to work, and work that can be performed in this modality[14,50].

The type of transport used by workers is one of the critical tools for preventing the disease. However, large companies guarantee that employees use their vehicles or even offer them a specific means of transport. This aspect deserves special attention since recurrent public transport crowding has been one of the primary sources of contamination by the virus[38].

Faced with the impossibility of ensuring social distancing, testing and vaccination are control mechanisms that guarantee the mitigation of the disease. One of the strategies for coping and resuming activities is to carry out tests on a regular basis[62]. On the other hand, vaccination is one of the most cost-effective ways to prevent disease. In Brazil, vaccines are managed by the National Immunization Program, one of the most extensive public immunization programs globally, whose epidemiological and socioeconomic benefits are well known[64]. Therefore, they are not affordable for companies, which play an essential role in ensuring that their workers are vaccinated per the priority criteria established by municipal plans.

Currently, almost the entire population over 12 years of age has already started the vaccination process against COVID-19, within the criteria determined by their municipalities, although the vaccine does not prevent the contamination of people and

the transmission of the disease. Therefore, the return to face-to-face work is imminent for that part of the population that is still working remotely. However, the work environment refers to other aspects of illness besides the risk of contamination by SARS-Cov-2. The fear of being infected and transmitting the disease to a family member, the uncertainty regarding disease prevention, the death of friendships, and the anxiety and stress generated by the fear of contaminating with the virus in the workplace are some themes related to mental health illness that should be analyzed.

The literature shows several situations of psychological disorders presented by active workers. Health professionals are among the most affected due to the substantial risk of exposure and mental health disorders[38,60]. A Chinese survey found symptoms such as stress, anxiety, depression, and insomnia among workers upon return. Personal psychoneuroimmunity prevention measures, including frequent hand hygiene practice, mask use, and organizational measures, such as improved hygiene in the workplace and company concerns about physical health status, were associated with fewer employee psychiatric symptoms[65].

Final considerations

The COVID-19 health emergency imposes several challenges, profoundly altering social and work environments. Institutions have a long way of learning in organizing their work processes to guide all their workers adequately. One of the challenges for institutions and professionals is to avoid or mitigate workers' exposure to the new Coronavirus and its consequences since only small, error-prone studies have been published so far. Thus, further works on the risk of occupational exposure to SARS-CoV-2 and related diseases are required to establish strong enough evidence to devise clear public policies to prevent and control the disease.

Authorities' denial of SARS-CoV-2 extermination intensity, the economic pressure to prevent social distancing, the substandard conditions in the work environment, the slow adoption of measures to prevent contagion and implement vaccination are related to severe impacts on several categories of workers, demanding a quick response from society, committed institutions and workers' organizations.

Although the pandemic affected all workers, its effects were more powerful in some regions of the country and some groups of workers in different economic sectors. The working population engaged in essential activities and those categories unable to work remotely, highly affected by the disease, urgently required the adoption of measures to control the virus in the work environment.

The pandemic has exacerbated the structural inequalities of Brazilian society, which gained greater visibility with the dismantling of the workers' social protection network, mainly due to labor and social security reforms, and the economic crisis resulting from the health crisis, which elevated unemployment, informal work, lower household income, and substandard health care services.

Psychological effects have also impacted workers' health, besides harm caused by COVID-19. Social distancing, isolation, anxiety, unemployment, loss of income, and fear of the future severely influence the mental health of these individuals. Against this backdrop, the control and prevention measures necessary to mitigate the impact of the pandemic prevent the transmission of the disease and contribute to mental health recovery.

Finally, the relationship between the pandemic and work is intense and inseparable, so the disease substantially affected the several categories of workers. The disordered overlap of the different determinants contributed to the deterioration of the

pandemic, profoundly affecting the world of work and the most vulnerable population.

The pandemic established an urgency in constructing economic and public health policies to mitigate the consequences of the new Coronavirus. For example, implementing policies aimed at mental health, among others, is a condition significantly observed during the pandemic and for which health services are not adequately prepared. Thus, protective measures must ensure workers' access to social and emotional care.

Collaborators

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Received on 08/13/2021
Approved on 12/23/2021
Conflict of interests: non-existent
Financial support: non-existent