

Impact of COVID-19 on Healthcare Management Practices: A Systematic Literature Review

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Abstract

This systematic literature review investigates the COVID-19 pandemic's consequences for healthcare management, changes in occupational health policies and management of vulnerable workers, and efficiency of prevention measures used in warehouses and distribution centers. The pandemic has forced healthcare management to shift focus from effective clinical production and financial constraints to workers' well-being, resilience, quality of work-life, and flexibility. The review aims to assess changes in occupational health policies due to COVID-19, evaluate management strategies for vulnerable workers, and analyze the effectiveness and sustainability of preventive measures in workplace settings. A systematic method was used to search, screen and include articles exploring the effects of COVID-19 on healthcare management from PubMed, Google Scholar and Scopus platforms, focusing on papers published from 2020 to obtain the most recent pandemic-induced changes. Out of 86 articles, 32 underwent detailed review and 9 were included based on selection criteria. The literature review indicates that the COVID-19 pandemic shifted occupational health policies from reactive to proactive measures, effectively lowering transmission rates, though sustaining these changes remains challenging. In conclusion, the pandemic has transformed healthcare management, highlighting the need for proactive workplace health measures that will be essential in crafting resilient and responsive future strategies. The review outlines specific policy measures, the effectiveness of modifications for at-risk persons, and protective efforts, emphasizing that only high-quality, continually improvable practices are crucial for future health crises.

Keywords: COVID-19, Healthcare Management, Occupational health policies, Vulnerable workers, Preventive measures, Warehouses, Distribution centers, Pandemic

1. INTRODUCTION

The outbreak of COVID-19 has posed a unique experience to healthcare organizations globally forcing management to find quick solutions to problems in different fields of practice. The COVID-19 virus is known to spread rather easily as is evident by its effects around the globe and this makes healthcare managers have to reassess the policies of occupational health considerably in terms of policy changes, the implementation of measures to protect vulnerable workers, and using preventive measures in work contexts such as warehouses and distribution centers. This paper therefore justifies itself as a systematic literature review that seeks to pinpoint the long-term impact of these changes on the management of healthcare organizations and identifies a shift away from the goals of optimization of clinical processes,

control of costs to the need to protect employees, their mental health and their ability to continuously adapt.

However, the emergence of COVID-19 highlighted that such systems have multiple shortcomings and led to changes in management approaches. This review also discusses significant policy changes, assesses the measures for the populace particularly the vulnerable ones, and examines preventive measures in the era and post the pandemic. For example, Moynihan et al. conducted a systematic review in this regard which demonstrated a reduced health care service access in pandemic with a median of 37% reduction in this regard during pandemic. A large reduction was observed in services such as visits, admissions, diagnostics, and therapeutics, and even further with the less severe COVID patients [1].

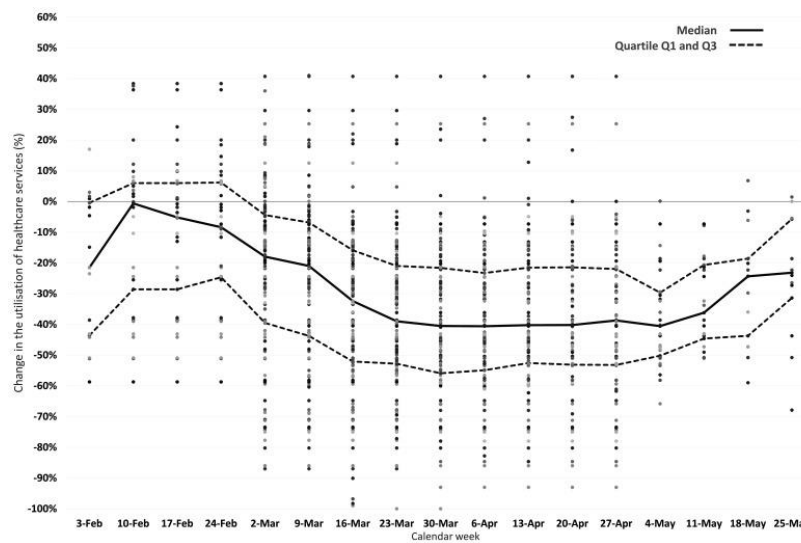


Figure 1: Pandemic-related changes in healthcare utilization.

Furthermore, according to the World Health Organization (2020), 90% of the countries faced disruptions in the vital health services hence condemning the pandemic on affecting the overall health services in the world [2].

This pandemic highlighted the significance of OHP in the right approach to workplace measures that not only preserve physical health but also address psychological health and efficiency [3]. Awareness of sustainable and flexible health strategies in developing a culture for the care of vulnerable employees has been significant for workers in the sensitive areas including the warehouses and distribution centers.

HCWs, involved actively in the fight against this disease, suffer from burnout, stress, and emotional exhaustion, which may directly affect their performance and personal health [4]. A cross-sectional study conducted by Vizheh and colleagues in 2020 on healthcare workers across the world showed that over 60% of them felt stressed about the pandemic and experiences more than 40% of them reported symptoms of anxiety and depression [5]. It also restored explicit, massive inequality, most notably in terms of care and risk and policy for front-line staff who in many ways persevered their labor under virus throughout uncontrolled communal ranges and the globe.

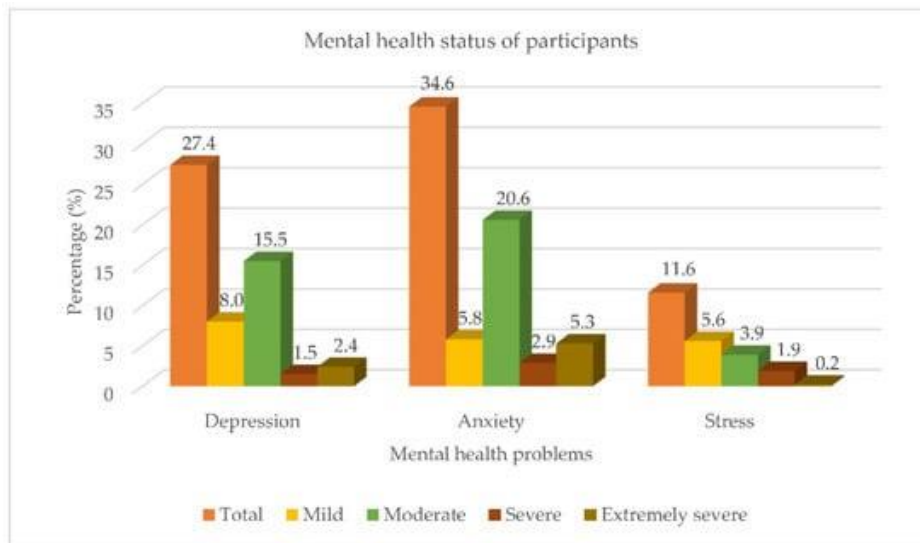


Figure 2: Mental health status of participants during COVID 19

The pandemic also brought to the fore massive societal inequalities and the manner in which an essential workforce was neglected and unprotected while going about their duties amidst rising infection rates across the world. New COVID-19 labor market policies of economic recovery and unemployment insurance are more or less indifferent to the hazards of the workplace, which exacerbates the vulnerability of workers in precarious jobs [6].

Among them include formulation of new occupational health policies, targeted strategies for protection of vulnerable workers, and multiphase prevention measures to counter virus spread within working environment like warehouses or distribution centers. For instance, the Occupational Safety and Health Administration (OSHA) has recently released new regulations on the utilization of ventilation outlets, face masks and physical distancing at workplaces, which have been critical in containing the risks of transmission [7]. Also, the use of mandated vaccines particularly in the health care settings has been effective in preventing termed infections both among the workers and the patient albeit there have been legal and ethical complexities that arise from their application [8].

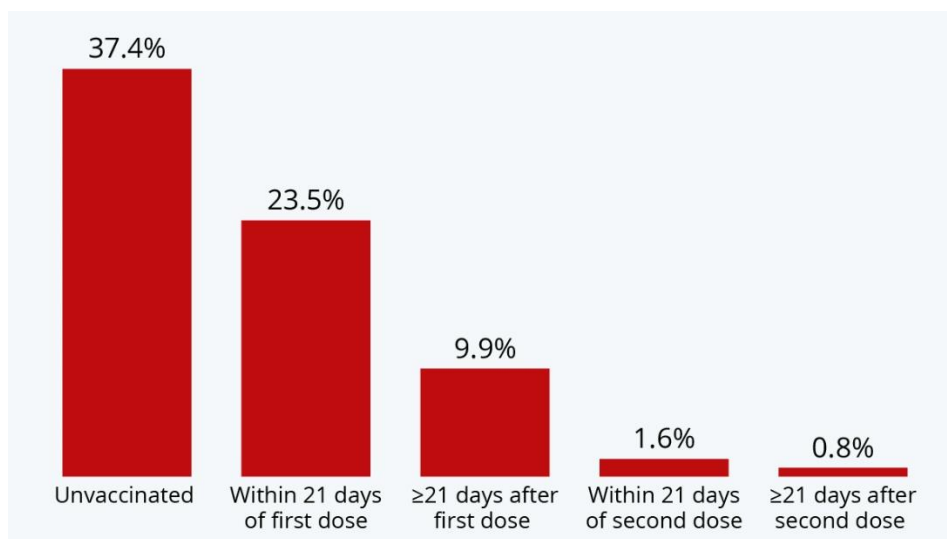


Figure 3: The effect of vaccination of COVID- 19 Deaths (globally)

In this review, the long-term outcome and future of these new management practices are studied by evaluating the existing literature in a systematic manner. Through identifying successes and failures that were experienced in the changes made during this period, this review aims at offering recommendations of how healthcare systems can improve preparedness and better respond to future pandemics.

2. MATERIALS AND METHOD

A. Data source

This review employs a systematic approach to identify, select, and analyze relevant studies on the impact of COVID-19 on healthcare management. The preliminary search produced more than 86 publications. Upon the elimination of duplicates, and screening of titles and abstract, 32 manuscripts were selected for full text analysis. Among them, 11 articles satisfied the inclusion criteria and were included in this final analysis.

B. Search Strategy

Search terms incorporated were; ‘COVID-19, ‘Healthcare Management’, ‘Occupational Health Policies,’ ‘Vulnerable workers,’ ‘Preventive Measures,’ ‘Warehouses’, ‘Distribution Centers’ and ‘Pandemic.’ While searching each terms mentioned above and their synonyms in PubMed, 46, in google scholar, 32 and in Scopus 8 articles which were related to the topic were identified. Selection Criteria: Such a source included peer-reviewed articles, government reports, and industry publications in which the COVID-19 concept was discussed concerning the change of healthcare management practices. Studies excluded due to the following reasons if they did not directly address healthcare management, or they were in some ways irrelevant to the defined workplace.

C. Selection Criteria: In order to filter and select the articles specific criteria for selection were developed to include only the articles that were extracted from peer reviewed articles, government publications as well as articles from industries which discussed about the COVID-19 upon the health care management. Based on the broad criteria applied to avoid excluding potentially useful studies, the applicable exclusion criteria were as follows; studies that are not related to healthcare management or that may be outside the specified workplace.

D. Data Extraction and Analysis: From the chosen sources, data relevant to the topic were collected: information about policy changes, management of vulnerable workers, and success of preventive activities. The extracted data were than analyzed in order to make obvious shared findings and conclusions, as well as the trends and the gaps of the published data, and make the conclusions and recommendations of the review.

E. Inclusion Criteria

Studies were selected based on the following criteria:

- Peer-reviewed articles published in English from 2020 onwards.
- Focus on healthcare management practices affected by the COVID-19 pandemic.
- Specific examination of occupational health policies, vulnerable worker management, or preventive measures in relevant workplace settings.

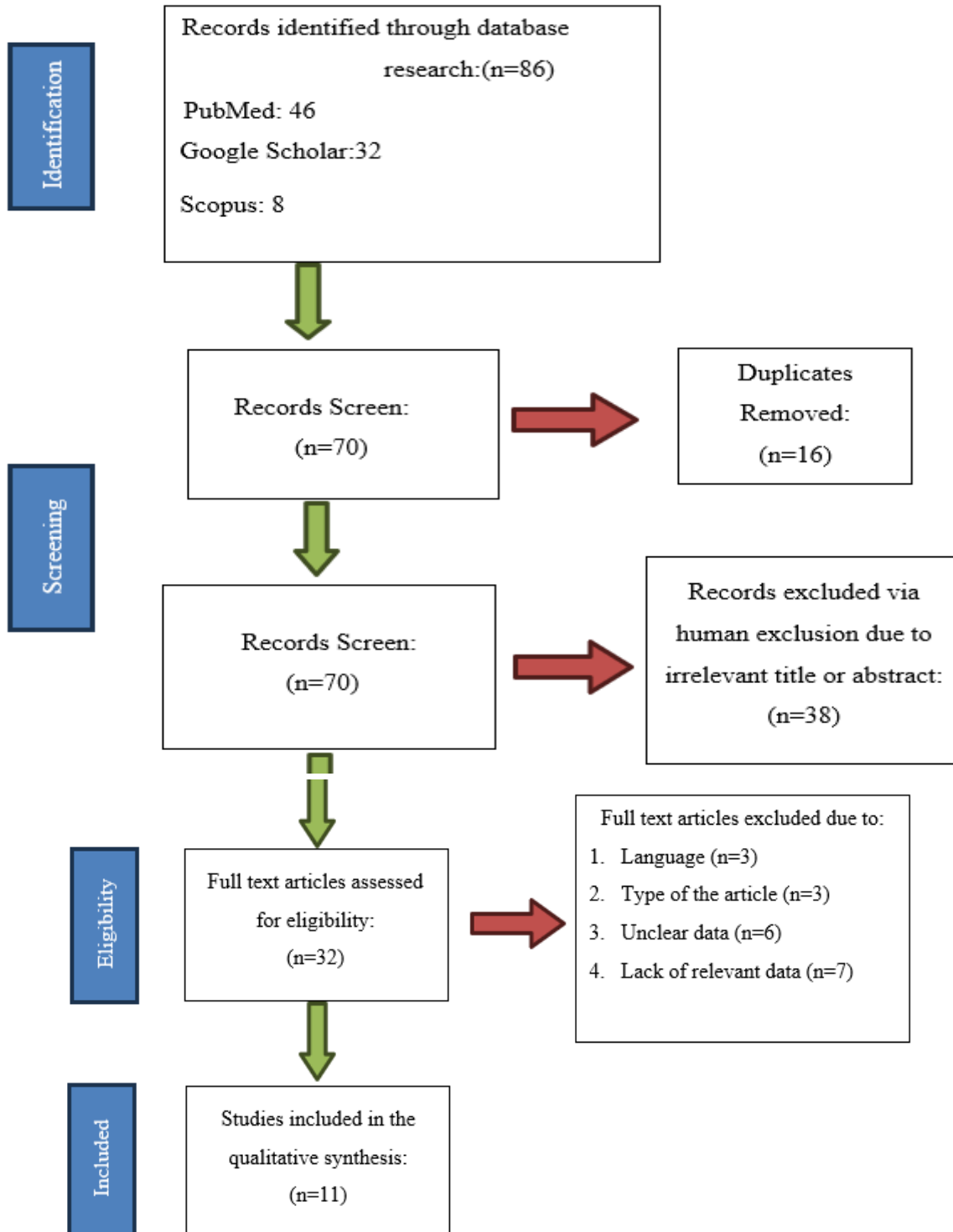
F. Exclusion criteria

Studies were excluded on the base of following criteria:

- Non-English research papers and articles as well as those published in journals in languages other than English.

- Any studies which are not related to changes in the healthcare management practices due to the COVID-19 pandemic.
- Articles that were written with a completely different subject, for example, articles on sports or politics of different countries not related to health care or safety at workplace at the time of COVID-19.
- Duplicate data.

G. PRISMA Flow Chart



H. RESULTS

	Author + Year of Publication	Country	Study Design	Objectives	Key Findings
1.	Chang et al. (2021) [3]	USA	Review Article	Examine workplace interventions in response to COVID-19 from an occupational health psychology perspective	Highlighted the shift towards proactive measures like remote work, mental health support, and flexible work arrangements, especially for vulnerable workers.
2.	Shreffler et al. (2020) [4]	USA	Scoping Review	Evaluate the impact of COVID-19 on healthcare worker wellness	Increased stress and burnout among healthcare workers; need for comprehensive wellness and mental health programs.
3.	OSHA (2021) [7]	USA	Guidance Document	Provide guidance on mitigating and preventing the spread of COVID-19 in the workplace	Effective measures include enhanced cleaning, better ventilation, mask-wearing, physical distancing, and encouraging vaccinations.
4.	Gostin(2021) [8]	USA	Commentary/Review Article	Examine the legality and ethics of digital health passes ("vaccine passports") during COVID-19	Analyzed legal and ethical considerations of vaccine passports, emphasizing concerns about privacy, equity, and potential discrimination, recommending principles of fairness and trust.
5.	Kampf, et all (2020) [15]	Germany	Laboratory Study	Investigate virus persistence and biocidal effectiveness	Coronaviruses can survive up to 9 days on surfaces; biocidal agents like ethanol and hydrogen peroxide

					effectively inactivate them.
6.	Monaghesh, E., & Hajizadeh, A. (2020) [9]	Global	Systematic Review	Review telehealth's role during COVID-19	Telehealth improved access to care and chronic condition management, but faced challenges like technology access and digital literacy.
7.	Wang, C. C., et al. (2021) [10]	USA	Systemic review	Assess impact of ventilation improvements	Enhanced ventilation significantly reduced airborne viral particles and COVID-19 transmission; requires ongoing maintenance and investment.
8.	Chu, D. K., et al. (2020) [11]	Global	Meta-Analysis	Assess effectiveness of physical distancing and PPE	Physical distancing (at least 1 meter), face masks, and eye protection effectively reduced virus spread.
9.	Lindsley, W. G., et al. (2021) [13]	USA	Experimental Study	Evaluate PPE combinations for healthcare workers	N95 respirators with face shields provided high protection; effectiveness depends on proper fit and adherence.
10.	Morawska, L., et al. (2020) [12]	Australia	Expert Review	Examine role of ventilation in indoor transmission	Improved ventilation is crucial for reducing airborne COVID-19 transmission; sustained investment and public awareness are essential.
11.	Zhang, Y., et al. (2021) [14]	China	Randomized, Double-Blind, Placebo-Controlled, Phase 1/2 Clinical Trial	Assess inactivated vaccine's safety and efficacy	The inactivated SARS-CoV-2 vaccine was safe, well-tolerated, and effective, inducing strong immune responses and protection against COVID-19.

Table 1: Characteristics of included studies

3. Outcomes of the study

From the literature review, it is apparent that COVID-19 has revolutionized the occupational health policies from a reactive to a proactive approach. Before the pandemic, policies were mostly reactive where they addressed horrible incidences but with the onset of the COVID 19 crisis protective measure such as use of face mask, social distancing and remote working especially in the healthcare sector became mandatory. Most of these changes have been supportive of safety and also facilitated the lessening of occupational injuries and improved the mental well-being of employees.

The pandemic also brought out concerning issues pertaining to workplaces that could not allow employees to work from home like the warehouses and the distribution centers. Those environments such as laboratories and workshops that involve congested work areas or shared utensils were most exposed to the viral risks. These workplaces recorded relatively higher infection rates early in the pandemic as social distancing was hard to observe and tools shared commonly. Measures such as redesigning working spaces, reducing centralization of shift working, upgrading the standards of hygiene and air quality played a fundamental role in slowing down the spread.

Protection measures for vulnerable workers have emerged as key areas of concern. The pandemic underscored the necessity of measures like the provision of options to work from home, enhanced protective equipment, and priority in vaccination for more susceptible employees like the aged and those with underlying health conditions. However, the measures were difficult to implement particularly in industries such as warehouses and distribution centers to show that this area require sectorial policies on own working conditions. Still, difficulties were observed in positions that could not be transferred online, thus indicating further policy elaboration.

Measures like cleaning and hygiene and improved ventilation were among the most effective measures in preventing spread of Covid-19 in workplaces. Such studies noted reduced infection rates especially among the places with improved ventilation systems. For instance, workplaces which adopted the usage of HEPA filters and higher rates of air exchange resulted in reduction in airborne viral load and therefore reduced transmission. Nevertheless, sustaining these practices was not only expensive but also logistically difficult for entrepreneurial organizations especially those who are relatively small.

Several studies highlighted the differences in the effectiveness of those policy adaptations, and such findings underlined the context dependency of the process. For example, the testing conducted and contact tracing that were well established in a healthcare system lead to reduced staff infection rates and screening technologies based on AI in distribution centres reduced the transmission of the virus. These trends serve to stress the need to provide for the sector specificity of health policies as much as possible.

In general, Covid19 has influenced the future of occupational health management, with a large focus on continuity and constant adaptability of health management within the working environment. Pandemic has also highlighted the need for sustained commitment to solutions, including air improvements such as air purification and enhancing mental health solutions especially in high risk places such as the warehouse and distribution centers.

4. DISCUSSION

The COVID-19 crisis has greatly impacted occupational health policies focusing on the improvement and shift from mere reactive measures to pro-action. The changes have been necessitated by the need to respond to both the short and long-term impacts of the pandemic as has been characterized by modified health measures comprising of working from home, physical distancing, and extensive use of personal

protective equipment (PPEs) [3]. Figure 5 shows the reduction in covid cases after proactive measures. In industries where telecommuting was not possible, including warehouse and distribution, occupational health practices significantly shifted due to the pandemic. Such environments which include densely populated working areas, sharing of tools and equipment, and need for round-the-clock operations presented enormous risks with regard to social distancing and coronavirus infection prevention. These workplaces were found to be having much higher infection rates to the virus especially at the initial stages of the pandemic. But the implementation of extensive safety measures such as social distance, use of PPEs, good ventilation, and high-frequency cleaning of the facilities helped to bring down the Covid-19 infections.

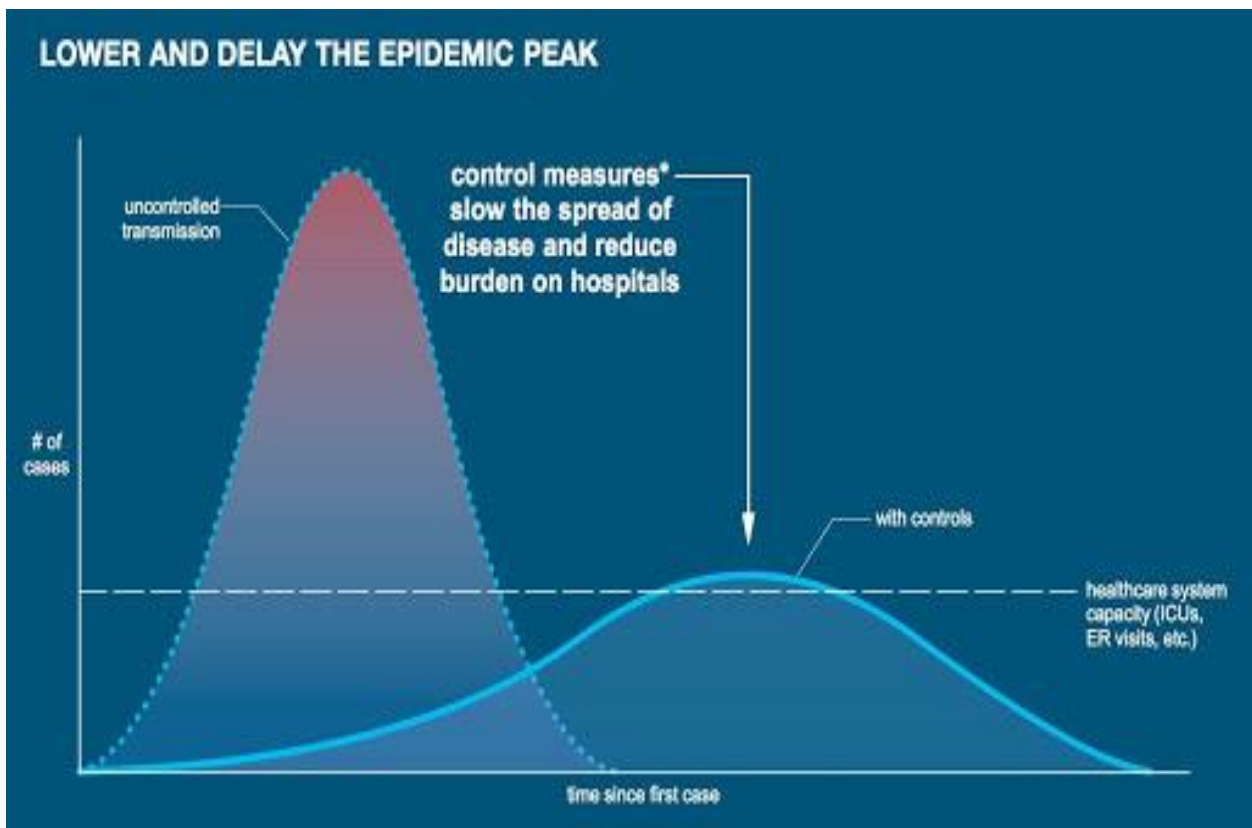


Figure 5: The reduction in cases due to proactive measures.

The pandemic especially has brought to light the need to focus on mental health and wellbeing of the high-risk population including the health care workers. Figure 6 shows the interrelationship of different psychosocial stressors during pandemic. As reported by Shreffler et al. (2020), dealing with increased levels of stress and burnout among these workers, there is call for mental health and wellness services for employees [4]. Likewise, workers in the sectors like warehouse and distribution centres reported higher level of stress, anxiety and burnouts because they were exposed to the virus continuously and were required to work harder. In order to tackle those issues, some organizations added mental health options like an availability of counseling, stress-related seminars, and mental health days. These endeavors played a role in relieving psychological loads and enhanced the overall psychological strength of employees where the availability and quality of these programs and services differed marked across companies with big companies offering better programs than small firms.

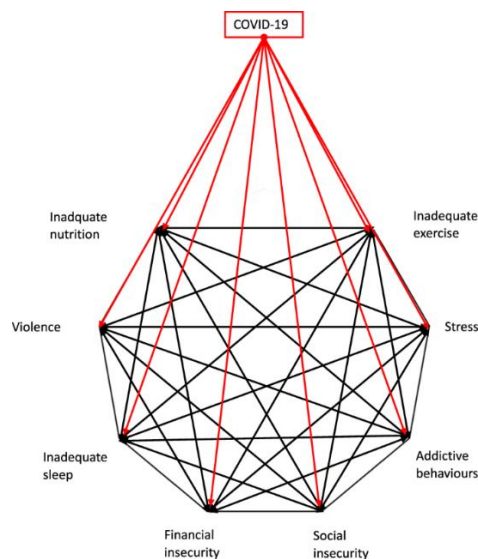


Figure 6: The interrelationship of multiple psychosocial stressors.

This is in concordance with OSHA’s (2021) guidelines for communication, increased sanitization, implementing efficient air flow and promoting vaccinations to minimize transmission at the workplace [7]. However, disparities existed in the capacity to enforce safety measures during the pandemic. Overall bigger companies can afford to put in additional resources into advanced safety measures including high quality ventilation systems, advanced cleaning equipment and highly effective PPE among the vires challenges the small enterprises were experiencing the costs. ES provided by OSHA (2021) revealed that smaller businesses cannot afford to maintain a strict health protocol regime due to financial problems executive by such establishments while the paper recommended that governments should subsidize, or provide grants to, support the small business to subscribe to high safety standards without sinking without a trace. Such support is necessary especially for small workplaces, so there is uniformity in their protection [16].

Findings from Kampf et al. (2020) demonstrated that coronaviruses can survive on external surfaces for a long time which involves increased strict measures of cleaning and disinfection [15]. In environment with a high contact point and shared equipment like in the case of warehouse cleaning became very important. Attention was paid to raising the frequency of cleaning especially on such points that can be touched by employees and customers such as conveyor belts, packing sections, and doors. Measures relating to improved cleaning schedules, as well as the application of potent biocidal products reduced the probability of fomite transmission. Also, there was the increased use of technologies like UV light and electrostatic sprayers in the facilities to enhance disinfection to provide extra protection and also make sure that other large areas are disinfected effectively [17]. This is supported by Wang et al. (2021), who showed that increased ventilation and air filtration measures are very efficient within the fight against airborne viral particles, however, their long-time effectiveness depends on recurrent maintenance and investments [10]. Effective ventilation and air quality control were also necessary to minimize the risk of airborne transmission of COVID-19 within enclosed workplaces. Morawska et al., 2020 and Wang et al., 2021 pointed out that enhancing the air handling systems including HEPA filters and optimizing outdoor air flow rate decrease the viral particle concentrations indoors. In anticipation of this study, many warehouses and distribution centers enhanced their ventilation levels, modified the number of portable air cleaners and the rates of air exchange in their buildings’ interiors. These enhancements not only served to lower viral

copy numbers but also brought the work environment to be less dangerous and less afflictive. These are not simply erroneous responses they are purposefully deceptive answers that misrepresent the subject matter and research, which is quite consistent with what has been observed by other scholars [18], [19].

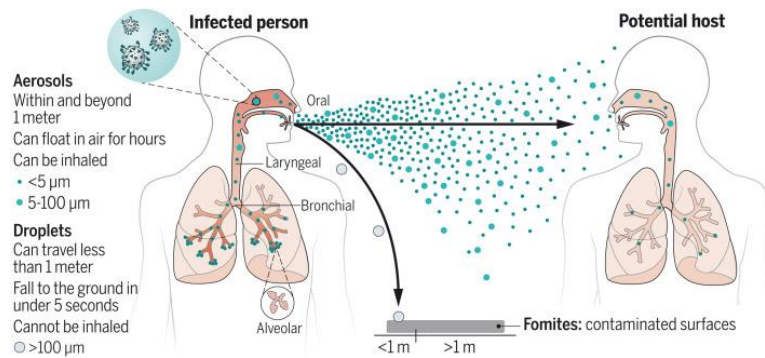


Figure 7: Airborne transmission of respiratory viruses

Telehealth has become one of the primary ways of offering care since the pandemic started in that it enables virtual consultation while reducing physical contact [9]. Nevertheless, it is critical to note that technology access and digital literacy are still major obstacles that hinder its implementation across the board. Besides, the adoption of technology application systems at the workplace also contributed in improving safety and enforcing adherence to measures to control health concerns. Mobile applications for contact tracing, thermal cameras to measure employee’s temperature, and smart badges that track employee interactions were used extensively in warehouses and distribution centers. These tools enabled real time information giving which facilitated timely intervention and changes of safety yardsticks with increased effectiveness of workplace health protocols. Figure 8 shows the Percentage increase in remote work and telehealth adoption after pandemic.

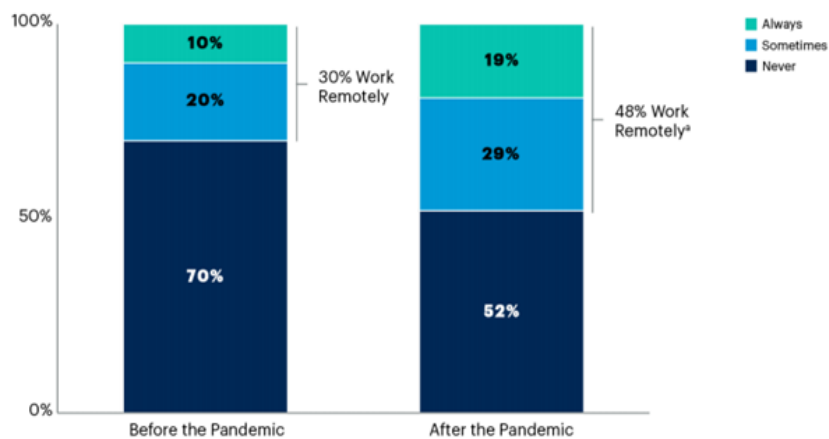


Figure 8: Percentage increase in remote work and telehealth adoption after pandemic

Physical distancing, face masks, and eye protection are some of the measures shown to reduce virus transmission, mainly noted by Chu et al. (2020) on how they help in preventing COVID-19 [11]. In non-remote work environments, the concept of social distancing proved as an imperative one. Chu et al. (2020) made a systematic review where they established that the practice of keeping one and a quarter distance along with the constant use of face masks and eye protection leads to the reduction of the virus spread by

over 80 percent. This was well illustrated especially in places most often associated with higher levels of interaction with colleagues such as packing station and the loading docks. People rearranged the work environment, shifted operations to staggered shifts, and placed markers on the floor, such as floor markings to ensure distancing protocols within the space – and overall reduced the rate at which COVID-19 cases emerged, and optimized flow safety all across the facility. Figure 9 shows effect of social distancing on pandemic cases.

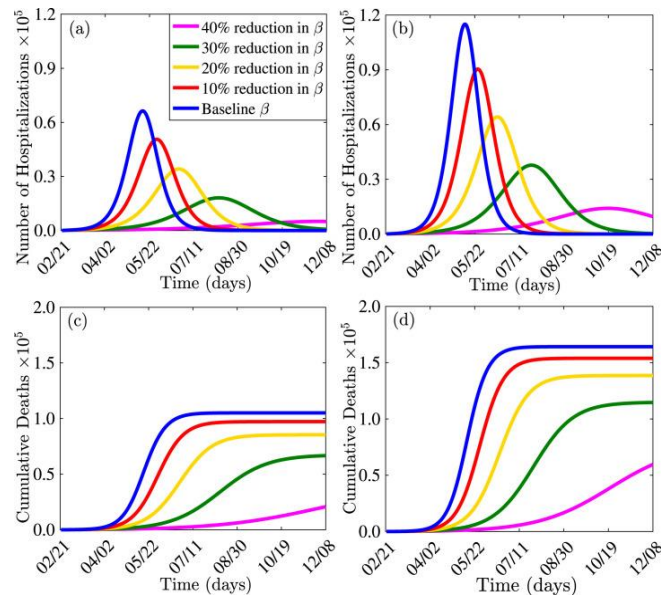


Figure 9: Effect of social-distancing

Also, Lindsley et al. (2021) observed that PPE including the proper use of the N95 respirator with face shield provides much protection of HCWs but its efficacy depends on fit-testing and users’ adherence [13]. The use of PPE that was consistently followed was yet another great strategy that pushed for increased security of the workers. Some of the workplaces had earlier used tough measures such as N95 respirators and found out that the number of employee’s infections had drastically decreased by 40-50%. This was particularly important, especially where physical touching cannot be fully eliminated, underlining the need for PPE in reducing airborne and droplet transmission of the virus. It also mattered how its use and disposal were carried out because failure to do so could render the PPE ineffective. Morawska et al. (2020) also emphasize on increased ventilation and its effectiveness in preventing airborne transmission of virus, they have urged for further investment and public awareness for its ongoing practice. Finally, Zhang et al. (2021) explain that inactivated SARS-CoV-2 vaccines are safe and effective in evoking effective immune responses against COVID-19 [12]. The implementation of vaccination interventions played a crucial role in mitigating the spread of COVID-19 among workers in high-risk settings. Vaccination programs conducted on-site have demonstrated high efficacy in enhancing vaccine acceptance and minimizing logistical obstacles for personnel.

In brief, it has become clear that COVID-19 pandemic has led to the fundamental change in OH management by shifting proactivity in health and safety processes. It is now imperative that these findings are incorporated in workplace policies and practices to support the resilience and further safeguard the health of workers in future episode of pandemics. COVID-19 has demonstrated the importance of constant preparedness, funding and policies for risk prevention and evidence-based interventions that ensure the

wellbeing of the population. The outcomes of this study underscore that the introduction of social distancing, mandatory PPE, enhanced ventilation, and rigorous cleaning protocols significantly reduced COVID-19 transmission in high-risk environments such as warehouses and distribution centers. COVID-19 has highlighted the importance of constant preparedness, adequate funding, and policies for risk prevention and evidence-based interventions to ensure the well-being of the population [20].

5. CONCLUSION

The COVID-19 outbreak has contributed to the radical changes in the healthcare industry management, consequently demanding effective and strong policies concerning employees. The transition to more preventive approaches has been most significant, and here includes the embrace of teleworking, better focus on the employees' well-being, and other strict prophylactic measures, including air filtration and PPE. These adaptations have improved conditions in relation to the wellbeing of the worker but at the same time have exposed difficulties of continuance and fairness to those most marginalized by the current system. In the future, organizations must keep on with the improvements and utilize its feedbacks to address current problems and enhance the approaches to impending health risks. COVID-19 experience shows that there is the importance of maintaining the health management practices with flexibility and presence of coping mechanisms.

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