

How COVID-19 Affected the Work Environment and Psycho-Social Health of Information Technology Workers

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This research provides valuable insights into the impact of COVID-19 on the education system, the need for adaptation, and the importance of various aspects such as experiential learning, emotional well-being, mental health, workplace and online education. It offers recommendations and considerations for policymakers and practitioners in higher education to navigate the post-pandemic world successfully.

Keywords: IT workers, information technology, COVID-19, impacts of COVID-19, mental health

THE HARDSHIPS OF COVID-19

The COVID-19 pandemic had many impacts on different job fields including Information Technology (IT) workers who had to adjust to the quick change in the work environment. These workers and many others had to adjust from working in an onsite or office setting to one that was completely online. This sudden change in the work environment had many effects on Internet Technology workers' mental health,

physical health, and work productivity (Goveas, Ray, et al, 2021). The demand for IT workers has increased since most occupations have had to adapt to working with remote services, and extra needed support that could only be provided by IT workers. With this increase in demand, workers in information technology had to be on the frontlines for all occupations (Bhatta, N. M. K, et al, 2021). Evaluating various research collected on this topic found that the switch to asynchronous work decreased communication and collaboration between coworkers and their organization. This research shows both the advantages and disadvantages of IT workers working from home and how they managed to maintain their mental health during the pandemic.

INTRODUCTION

When COVID-19 first appeared, the world seemed to have come to a screeching stop. Because of COVID-19, people have had to find new and creative ways to continue to work and go about their daily activities, and this was one of the biggest impacts it had on work environments. Individuals who would have otherwise been working in a collaborative environment in their workplace, were confined to their homes in hopes of stopping the spread of the virus. Before the COVID-19 pandemic, only about 5% of the American workforce population worked from home a few days a week (Yang et al., 2022). In April 2020, as many as 37% of the workforce in America were working from home full-time (Yang et al., 2022). Along with this, people have had to turn to the internet for everyday tasks such as grocery shopping and schooling. This in return, has caused a major surge in digital infrastructure. “Internet services have seen rises in usage from 40% to 100%, compared to pre-lockdown levels” (De' et. al., 2020).

Many companies had to comply with this newfound need to become digital to appeal to the masses. Employers began “relying on artificial intelligence, machine learning, and virtual reality to save money and limit in-person contact” (Nagele-Piazza, 2020). This has led to an increase in the need for Information Technology workers, especially in workplaces. The pandemic has been incredibly stressful for the information technology sector in terms of their increase in need during COVID-19, the move from working in-person to remote, and the transition back to in-office work has heavily impacted IT workers’ mental health. Workplace stress is the harmful physical and emotional responses that can happen when there is a conflict between job demands on the employee and the amount of control an employee has over meeting these demands (Rao & Chandraiah, 2012). Information Technology professionals became accustomed to working at home because of how the pandemic overlapped into two years, but now that public health concerns have settled due to vaccines, most workers have had to transition back to in-person work, resulting in changes in employee productivity and collaboration.

The Increased Need for IT

During COVID-19, the information technology sector had an increase in demand for cybersecurity and technology professionals because of how many different departments had to become accustomed to working remotely. Before the pandemic, “only 6% of the employed worked from home” (Cotate, 2021). While “another 57% say they rarely or never worked from home before the coronavirus outbreak” (Parker et.al., 2022). However, now it is reported that “more than a third of U.S. households reported working from home more frequently than before the pandemic” (Marshall et.al., 2021).

With, “millions turning to the internet and technology for entertainment and work, causing unprecedented spikes in data traffic and in-home data usage, it shows how vital digital infrastructure is to the future of societies and economies” (Brannen et. al, 2020). Data infrastructure has been changed drastically by the COVID-19 pandemic, which has increased demand for IT workers to assist with helping people navigate through remote work life. Most departments within a business and professional organization have had to learn to adapt to remote services, and IT workers have played a huge role in being used more since the beginning of the COVID-19 pandemic, along with the uptake in data usage. Since COVID-19, to keep up with the rise of hybrid and fully remote professions, the need for IT workers has skyrocketed. Because of the increased demand, “Computer occupations are projected to grow by 13.4

percent over the 2020–30 decade, which is 5.7 percentage points faster than the 7.7 percent average for all occupations” (Hylton et.al., 2022).

In May 2020 there was a decrease of about 17.6 million jobs compared to May 2019, however, there was an increase of about 1.2% in tech-related jobs. The need for software developers, cybersecurity experts, and data scientists had skyrocketed with an increase of over 60,000 employees after the start of COVID-19 (BestColleges, 2021). Over the next decade (2020-2030) tech jobs are predicted to increase by 13.4%, this includes not only IT-related fields but telehealth services. Like many businesses being shut down and not seeing customers in store, doctors' offices were also unable to see patients and had to work completely online through video or phone call office visits. This was a huge adjustment at first but eventually became a well-liked method of doctors' visits (U.S. Bureau of Labor Statistics, 2022). Despite the massive layoffs that have been happening at major companies like Google, Amazon, and Microsoft, it still is showing that tech jobs are the most in-demand right now. It has been stated that these layoffs are due to the over-hiring that happened at the beginning of the COVID-19 pandemic when tech jobs were at the highest they have ever been. A highlight is employers are now recognizing the potential in applicants when they have certain skills that do not necessarily meet the criteria. This is due to the excellence of online courses and boot camps that showing remarkable results on new employees (CNBC, 2023). Due to the COVID-19 pandemic, women across the nation have been suffering significantly, lowering the workforce levels down to levels from 1988, with a total of 156,000 lost jobs, which accounts for 111% of the lost jobs just in December 2020 alone. The increase of opportunities for women in tech is still current, with many employers trying to fill entry-level and leadership roles, it states, “Women are having an easier time finding higher level positions during the pandemic than in previous years” (WTC Community, 2023). With technology being the main source of communication COVID-19, it became important for companies like Zoom to ensure that they are hiring an adequate number of tech employees to keep up with the high demand of users. It has been found that there will be an even bigger tech rebound in the future and it is noted that right now is the best time to increase job skills and land a job while it is still in high demand (Summit Human Capital, 2022).

Mental and Physical Health of IT workers

Due to the increase in demand, many IT workers have been overworking and the pressure of being more in demand has affected their employee productivity and sleeping patterns. The health of IT workers had fluctuated during the pandemic ever since the transition to remote services. Many IT workers described their mental health worsening and affecting their overall physical health due to the transition and socioeconomic changes from COVID-19. “Nearly half (44%) of IT sector professionals said they had their mental health affected since the start of the pandemic” (Mari, 2021). These stressors along with prolonged periods behind a computer screen have been a factor in health problems for IT workers during COVID-19. Psychologists had conducted a “study that revealed 84.7% of male and 85.1% of female IT workers during the pandemic spent more than 8 hours in front of the computers in comparison with 52.7% of the males and 52.5% of the females in the pre-pandemic period” (Nasui et.al., 2022). This behavior leads IT workers to live a more sedentary lifestyle and gain weight, along with an increase in depression among IT professionals. The amount of screen time and the number of hours also plays a role in this, resulting in more fatigue, depression, and negative impacts on mental health.

COVID-19 disruption resulted in a polarizing shift concerning psychosocial habits, thought processing, and behaviors. Several scholars have brought awareness to opposition and challenges in response to COVID-19. The adverse effects of COVID-19 also played a key role in rates of anxiety, depression, and social isolation. Career exasperation has positively correlated with mental health symptoms. IT professionals were being asked to overcome a growing list of challenges, often resulting in longer work hours and around-the-clock support, which lead to them being at risk of suffering work-life conflict. A poor work-life balance and related stress could negatively affect the output of employees and therefore decreases their productivity. The cause for such psychological distresses could be personal beliefs and conditions at the home, family, or society (Mahalakshmy, et.al., 2020). As a result, increased stress and anxiety levels may impact IT workers' psychosocial health because wellness dimensions are mutually codependent. The

eight dimensions of wellness consist of “mental, emotional, social, physical, spiritual, environmental, occupational, and financial health.” (Stoewen, 2017).

The COVID-19 pandemic impacted many populations, but the emphasis is on IT workers. This is because this study group is susceptible to the impact of the pandemic while being underrepresented in COVID-19 research. The associated findings can lead to “opportunities for interventions targeting lifestyle behaviors, well-being, disrupted social connections, and paying closer attention to those with specific medical and mental health histories that may reduce loneliness and improve mental health” (Goveas et.al., 2021). Moreover, it has been suggested that these changes may result in delays in time to completion, as well as reduce successful entry into the job market (Hamza et.al., 2021). When work environments brainstorm on the advantages and disadvantages of their decision-making processes, among IT populations, they must “also consider who is most at risk for increased stress and anxiety during the pandemic” (Hoyt et.al., 2021). Bringing awareness to the health challenges of IT workers amid a pandemic is essential for evaluating potential long-term consequences on psychosocial health and all eight dimensions of wellness. Another finding is associated with career choice and job performance, “findings suggest that symptoms of psychological distress are common among... professionals during... COVID-19... as such symptoms may negatively affect job performance” (Li et.al., 2021).

Pandemic effects brought about a significant shift in the way we work, with many industries, including the IT sector, rapidly transitioning to remote work arrangements. This new way of working has brought about unique challenges for IT workers, including an increased rise in sedentary behavior and increased screen time. It is important to consider physical health in relation to the psychosocial health of IT workers during this time as we saw an increase in stress and anxiety among IT workers around the world. Physical activity has a profoundly positive impact on psychological health, by enhancing self-esteem and resilience to stress and reducing depression and anxiety (Maugeri et.al, 2020).

Understanding how physical health and psychosocial health are linked can help us understand the patterns in relation to stress and anxiety found in IT workers during this time as well as how IT workers did or could have handled the new stressors in life. With many IT workers transitioning to remote work, there has been a rise in sedentary behavior, leading to a decrease in physical activity levels. In a study aimed to investigate the immediate impact of COVID-19 quarantine measures on physical inactivity and weight gain among Sri Lankans, it was found that more than half of the respondents (52.4%) reported decreased exercise levels (Sooriyaarachch et. al, 2021).

Another study that aimed to summarize the literature on physical activity and sedentary activity during the COVID-19 pandemic amongst the working population, the study showed that most of the literature reported physical activity levels significantly decreasing during the COVID-19 pandemic, while sedentary behavior increased significantly (Ráthonyi et. al, 2021). Additionally, a study conducted on IT workers in Romania before and during the COVID-19 pandemic by Nasui et. al in 2022, found that 50.5% of men and 45.3% of women experienced weight gain. With the shift to remote work, many IT employees have had to adjust to working from home, which has resulted in longer periods of sitting and reduced physical activity. In addition, physical activity was reduced due to the closure of many places during COVID-19 lockdowns, especially gyms and fitness centers. Not only were there physical barriers that reduced activity levels of IT workers but also psychological barriers, such as a fear of getting COVID-19 and the possibility of being hospitalized and even dying.

An increase in physical inactivity and sedentary behaviors are important because they can lead to weight gain, decreased cardiovascular health, and other physical health issues. A sedentary lifestyle, which is characterized by prolonged periods of sitting and low physical activity levels, is associated with an increased prevalence of psychological stress and weight gain (Saeed & Javed, 2021). In the Sri Lankan study, conducted by Sooriyaarachch et. al in 2021, 38.5% of respondents reported weight gain and the average weight gain was 3.61 kg. Gaining weight can increase psychological stress by reducing one’s self-esteem, reducing one’s body image, and decrease mental health (Emmer et. al, 2020).

Weight gain among IT workers can increase the risk of developing cardiovascular problems, which can have serious health implications. Young adults who are obese or gain weight are at a higher risk of developing coronary heart disease, according to research findings in the Sri Lankan study on the impact of

COVID-19 quarantine measures on physical inactivity and weight gain. In another study, conducted by Kaneko et. al, body weight gain in adulthood frequently leads to obesity and subsequent cardiovascular disease. Excess weight can put a strain on the heart, leading to an increased risk of developing high blood pressure, diabetes, and other health conditions that can contribute to the development of cardiovascular disease. It is important to understand the link between increased sedentary behavior, weight gain, and cardiovascular disease because cardiovascular disease is one of the leading causes of death globally. Understanding the risk factors associated with cardiovascular diseases, such as sedentarism and weight gain, can help IT workers take preventative measures to reduce their risk of developing cardiovascular problems or diseases.

Remote work has also resulted in increased screen time, leading to eye strain, headaches, other vision-related problems, and physical pain and discomfort. With working from home during COVID-19, IT workers faced increased screen time and sitting periods. In the Sri Lankan study conducted by Sooriyaarachch, 82.7% of participants reported increased screen time and 63.5% reported increased sitting time during the workday. Prolonged eye strain can have negative effects on work productivity and quality of life. The prevalence of digital eye strain was 82.41% in a study conducted by Zayed et. al in 2021. In the same study, the symptoms were headaches, burning of the eyes, and blurred vision; 81.5% headaches, 75.9% burning of the eyes, and 70.4% blurred vision (Zayed et. al, 2021). Eyestrain could be due to computers facing windows producing glare, user-to-monitor distance, long hours of computer use, and inappropriate lighting. Poor ergonomics while working from home can also lead to musculoskeletal pain and discomfort, such as back pain and neck pain. Musculoskeletal problems could be due to poor computer facilities, workstation layout, long hours in the same posture, and inadequate rest breaks (Shikdar & Al-Kindi, 2007). A wide variety of health problems were reported: 45% shoulder pain, 43% back pain, 35% arm pain, 30% wrist pain, 30% neck pain, and 23% leg pain (Shikdar & Al-Kindi, 2007).

With the shift towards remote work during the COVID-19 pandemic, many IT workers have been spending prolonged periods of time in front of computer screens. Due to the increased screen time and sitting time of IT workers, it is highly possible that many of these workers experienced digital eye strain, headaches, other vision-related problems, and physical pain and discomfort. The physical health impacts of COVID-19 on IT workers can also have negative effects on their mental health. Physical health problems can cause stress and anxiety, which can further exacerbate mental health problems (Chandraiah, K., 2012). Furthermore, physical health problems can interfere with an individual's ability to work, leading to feelings of frustration, helplessness, and a sense of loss of control.

Employee Productivity

Employee productivity has also been a major concern in IT workers' lives because of the sudden shift to remote work at the start of the pandemic. Many professionals have said that employee productivity has decreased with the transition to working from home, while others have said it has stayed the same. At the beginning of COVID-19, "employers first sent people home in reaction to the spread of the coronavirus, and many-faced challenges with getting employees the equipment they needed and optimizing their VPN networks to ensure connectivity" (Maurer, 2020). Changing to remote work caused employee productivity to decrease at first, and it was tough for IT workers to adapt to being completely virtual in our ever-changing world. However, when people went back to in-person as we tried to live with the "new normal" (Choudhury, et al, 2020), there was a slightly tough transition to getting employee productivity back up to par, but it gradually leveled over time. Although there are many downsides to working from home, there are some advantages. Studies show that working from home has made people more productive and people have more flexibility when it comes to working. Those who prefer to work from home like how they get to avoid traffic and save money on commuting to and from the workplace. (Jain, Currie, & Aston, 2022).

When IT workers switched to remote services, there was an increase in teamwork compatibility and networking, thus many professional organizations found many innovative ways to stay connected and collaborate despite being in virtual and remote spaces. When a team is more diverse and collaborates through temporal rhythms, there is a greater chance of effective communication, and teamwork, as well as much more motivation to complete tasks assigned to a group.

Studies have displayed that “shared temporal rhythm facilitates the coordination of work and reduces conflict among team members...scheduling tools can incorporate chronotype information to help individuals block out suitable times for focused activities” (Breideband et.al., 2022). While having a diverse team with people who have different chronotypes, otherwise known as the amount of differing energy an individual has in the morning versus night, teams can better divide them into smaller groups with those who have similar chronotypes to have effective productivity and coordination. Amidst the harsh impacts of the transition from in-person to online, teams who have used this method learned to become more collaborative while working together online. An example is within the branch of information technology that covers software development. Staff are constantly researching innovative ways that an organization can benefit from newly established software, some organizations found hybrid models during the pandemic to be successful.

A study on software developers during COVID-19 states: “Organizations can support remote work by understanding the varied experiences of developers and the challenges their employees may face, and that there are actionable recommendations they can follow to support developers working from home now or in the future as part of a hybrid model” (Ford et.al., 2021).

By dismantling each other’s differences within an organization and establishing a model that benefits all members of an organization versus one group, it will better assist with innovation and collaboration through hybrid models to ensure employee effectiveness while being remote and virtual. Creating these models will allow for a collaborative working space online, and promote a sense of community amid a tough transition (SHRM, 2023).

Research has shown that strong communication and strong ties between co-workers, and between an individual and the organization they work for are important in the success of the company (Granovetter, 1973). Workers who are able to gain new information from different structures of an organization through communication and connections within the network of a company have been shown to bridge gaps in the structure of an organization and have improved communication among workers (Yang et al., 2022). In technology jobs, this factor has a direct impact on the output of high-quality and creative work. It has also allowed for a competitive advantage in roles that practice inter-structural communication and knowledge transfer between people who work in different sectors of the same organization (Yang et al., 2022).

Strong ties between two individuals in a company can transfer information to each other more readily because they can connect on a common perspective. Strong ties can easily cooperate, trust, and take the time to understand the knowledge that is being transferred. This is different from two individuals with weaker ties that have not connected or share a common perspective (Granovetter, 1973). New information can still be transferred but this tie does not require as much time or energy to maintain (Granovetter, 1973). Studies have shown that a companywide shift from in-person work environments to work-from-home environments has caused groups to decrease in communication and become less interconnected throughout the organization. It has caused employees to spend less time communicating and collaborating with each other. This is because employees have spent more time communicating with their stronger ties for information as compared to their weaker ties when switching to a remote work-from-home environment (Yang et al., 2022). Many IT professionals have said that during the lockdown, they have spent longer working hours while at home which made them more productive, others say it either stayed the same or made them less productive when it came to working (Pantanjali & Bhatta, 2022).

Empirical as well as theoretical studies have also shown that information transfer and collaboration are greatly dependent on modes of communication that employees use with each other. In-person communication and interaction are shown to have richer communication channels and can effectively relay complex information. While remote styles of communication such as emails and video calls are better for conveying information and its meaning (Counts, 2021). Working from home and in remote positions can also affect problem-solving as more complex communication is better-relayed face to face (Chen, 2021). Having to solve problems online through remote communication styles can be difficult and lead to delayed solutions, psychological stress, and anxiety (Chen, 2021). Insufficient communication of information that is shared remotely has also been shown to increase the potential of conflict, lack of confidence in oneself, and fear among employees (Bussin & Swart-Opperman, 2021).

Findings have shown that remote work has caused workers to spend 25% less time communicating and collaborating with their fellow employees across all work-from-home groups, compared to before the COVID-19 pandemic (Counts, 2021). Due to the pandemic, individuals were forced to convey information asynchronously and synchronously, and more employees chose the former communication style, sticking to emails and messaging. These findings have shown that a switch to asynchronous communication made it more difficult to effectively relay information within an organization and has caused weaker ties to be used less and decreased the formation of new ties between individuals. Additional research done on virtual employee teams found that they suffered from a lack of accountability due to supervisors not being able to directly watch over employee performance (DeFilippis et al., 2022). Consequently, the switch to a remote work-from-home environment will have impacts on productivity and innovation among employees (Yang et al., 2022).

IT governance and management have changed due to the effects of COVID-19. Since IT governance usually depends on CIOs' implementing new strategies to help their organization become more effective, the COVID-19 pandemic impacted IT governance drastically. Studies have shown that "despite the well-known benefits of IT governance to organizations, previous studies revealed that many firms are still struggling to implement and apply frameworks to their work environment during the pandemic" (Miyamoto, 2022). IT workers have had to adapt to learning new ways to promote governance through a virtual environment, which has made it hard to establish due to the negative effects on employees' mental health, using new models an organization hasn't tried yet, and managing a remote team due to the differences of schedules. IT workers have had to find new ways to build trust, boost company morale, and track employee productivity during the transition to being remote (DeFilippis, E., et al, 2022).

The COVID-19 pandemic contributed to mental health help-seeking. Evidence suggests "that individuals with higher levels of anxiety rate their likelihood of help-seeking as higher and those who do seek psychological help report higher levels of depression. Further, those who began new treatment for behavioral health difficulties during the COVID-19 pandemic reported lower social support and less clarity about how they felt (specifically, emotional clarity when upset)" (Tambling et al., 2022). With lifetime prevalence rates of 17% for depression and 29% for anxiety disorders, they are the most common psychological disorders... It is clear that professional help, including psychotherapy, is useful in reducing the harms associated with depression and anxiety" (Tambling et al., 2022).

Technological advancement and innovations influence the character, development, or behavior of how IT workers involve themselves in psychotherapy. As a result, "technology-based therapy and counseling have received an increase in scholarly attention during the current pandemic" (Barney et al., 2020; Chenneville & Schwartz-Mette, 2020; Desai et al., 2020; Perrin et al., 2020). During the COVID-19 pandemic, levels of loneliness increased. This has been associated with anxiety, stress, and depression. Preventative measures and efforts to minimize the dissemination of COVID-19 also included isolation measures like quarantining, "appropriate clinical management of patients by proper screening, and diagnostic tools" (Tariq, M. U., & Abonamah, A. A., 2021). When limiting the spread of infection and contagious disease, psychological reactions also act as a factor due to "the emergence of emotional suffering and societal disturbance during and after the pandemic" (Tariq, M. U., & Abonamah, A. A., 2021). Emotional intelligence is key when regulating, monitoring, and managing emotions. This can directly impact psychological well-being (Barros, C., & Sacau-Fontenla, A., 2021). These findings concluded that addressing these concerns is crucial for the sake of the psychosocial health of this population.

FUTURE FINDINGS AND CONCLUSIONS

COVID-19 has impacted the socioeconomic capacity of the world and has strongly altered the psychosocial health and environment of workers in information technology. Due to the increase in demand, long hours being behind a computer screen, and negative impacts on mental health and lifestyle, IT workers have had to adjust to a new normal. When the world shut down, information technology professionals were on the front lines. The switch from in-person to work-from-home environments has impacted workers in all fields including technology and information technology positions by making it more difficult for employees

to exchange information and collaborate with each other. On a positive note, collaboration in a virtual environment has been much more effective, and many professional organizations were able to conduct models to promote a sense of community despite being in a remote setting. This allowed for new ways of engagement for team members to interact and created new avenues for projects to be completed virtually (Brannen, S., et al. 2020).

Despite going through a rough transition, IT workers established new innovative ways to work, promoting IT governance and innovation on a new level (McDonald C., Aug 2020). Overall, inadequate efforts to recognize mental health challenges may have lasting adverse effects on the social and mental health of IT workers. Extended research and studies concerning individual departments or the impact of mental and social health of IT workers on the spheres of influence during the COVID-19 pandemic should be conducted to further this research.

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