IMPACT OF COVID-19 PANDEMIC ON THE INFORMATION TECHNOLOGY (IT) WORKFORCE: A REVIEW OF THE LITERATURE

by

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Impact of COVID-19 pandemic on the information technology (IT) workforce: A review of the literature

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Abstract

The COVID-19 pandemic has had a significant impact on the work and personal lives of information technology (IT) employees. As organizations adapt to pandemic-induced changes, IT employees face increased work demands, isolation, and blurred boundaries between work and personal life, which may lead to burnout and turnover intentions. The pandemic has also resulted in a significant shift in how companies conduct business, including recruiting and acquiring IT talent. The demand for IT professionals has always been high, but the pandemic has created new challenges for IT talent management. This review examines the impact of the pandemic on the IT workforce in terms of burnout and talent management compared to before the pandemic and identifies correlations between burnout and talent management issues. The paper concludes with practical implications and recommendations for organizational practices to improve the IT workforce in the post-pandemic era with respect to burnout and talent management.

Keywords: information technology burnout pandemic, information technology retention, Information Technology Recruiting, information technology professional pandemic

Introduction

In December 2019, an outbreak of pneumonia from an unknown virus in China led to what later became known as COVID-19, which was declared a global pandemic by the World Health Organization in March 2020 (Ciotti et al., 2020). Due to COVID-19, many organizations quickly adapted and adopted digital technology, causing a digital transformation explosion (Hai et al., 2021). IT played a crucial role in facilitating remote operations for many organizations (Kaushik & Guleria, 2020). During the COVID-19 pandemic, IT professionals worked countless hours to keep their organizations operational remotely. As a result of COVID-19, there has been an increased demand for online or computer usage in all aspects of life, which can cause high levels of physiological activation, discomfort, and anxiety (Sharma et al., 2020). The COVID-19 pandemic may have also caused challenges in human resources, skills, and compensation (Mykytyn, 2020). Burnout can be defined as unsuccessfully managed work stress, including elements of physical, emotional, and mental exhaustion (Ninaus et al., 2021).

Problem Statement

Organizational information technology increased demands have caused an IT professional workforce imbalance in IT burnout and talent management. This may be a byproduct of overuse, and through research, one can find ways to manage problematic technology overuse and improve well-being (Barnes, 2020). It is significant to study the causes of burnout, signs of burnout, and prevention. Also, to dive into the challenges of talent management in IT in the post-pandemic environment in comparison to pre-pandemic.

Purpose of study

This study aims to identify trends in articles that indicate commonalities of burnout and talent management in the Information Technology workforce during two distinct periods involving COVID-19. The research adds to the understanding of post-pandemic concerns in IT burnout and talent management and identifies symptoms of IT burnout and strategies for managing IT professionals in the workforce across different eras by reviewing literature before and after the COVID-19 pandemic.

Research Question

RQ1: What are the similarities and differences in IT burnout and talent management before and after the COVID-19 pandemic?

Review of the Literature

Before the pandemic, one of the leading causes of IT burnout was the pressure to work long hours and meet tight deadlines. IT professionals often work longer hours than other professionals, and this can lead to burnout (Spector et al., 2011). IT professionals often work in isolation and may need access to social support from colleagues or supervisors (Moore, 2000). IT professionals often work in highly structured environments that can limit their ability to make decisions and control their work. This lack of control can lead to frustration and helplessness, contributing to burnout (Moore, 2000).

IT professionals often have to deal with a large volume of work and multiple demands, which can be overwhelming and stressful. This has led to burnout and reduced productivity (Tarafdar, Tu, & Ragu-Nathan, 2011). Lastly, before the pandemic, technostress, constant exposure to new technology, and pressure to keep up with technological advancements can be stressful and overwhelming. This can lead to burnout and decreased job satisfaction (Brod, 1984).

The pandemic created a digital surge and highlighted the importance of digital technologies (Pandey & Pal, 2020). During the pandemic, IT employees responded similarly to police forces like SWAT teams to provide IT support, systems, and solutions, ultimately contributing to business continuity for many organizations (Adeodyin & Soykan, 2020). IT professionals were frontline workers or warriors through COVID-19, yet there may not be a clear understanding of the effort of specific personnel to work 24/7 to effectively keep all critical systems connected and running smoothly (Arshad, 2020). IT professionals experienced a high degree of burnout associated with working from home (WFH) and managing everyday work during the pandemic when they had the possibility of working twenty-four hours a day. The COVID-19 pandemic added new stressors, such as the sudden shift to remote work, the need to manage virtual teams, and the increased demand for technology to support remote work. Workplace demands and work-family conflict caused increased issues of work exhaustion in the IT profession (Progemmer & Kremar, 2021).

Pandemic and post-pandemic teleworking have increased significantly (Felstead & Reusche, 2021). IT professionals working from home during the pandemic reported higher levels of burnout than those working in the office. This could be due to the blurred boundaries between work and personal life, with work demands creeping into personal time. Burnout during the pandemic was also caused by the work climate and environment (Nobles, 2022). The COVID-19 pandemic increased burnout during its peak, with indicators of burnout being an increase in absences from work and early retirement (Ninaus et al., 2021).

Digital transformation initiatives that typically take years to complete were completed in months due to the pandemic, which seemed like emergency speed (Reuschi et al., 2022). Many IT professionals have needed help to keep up with the rapid pace of digital transformation. This acceleration has resulted in a significant

demand for IT talent, particularly those with expertise in emerging digital technologies. Retaining and attracting highly skilled IT personnel can be a challenge post-pandemic.

The shift toward remote work is one significant impact of the pandemic on IT talent management. The pandemic has forced many companies to shift their operations online or accelerate digital transformation, resulting in a surge in demand for IT professionals with expertise in remote work technologies. Employees must be prepared to change their skillset (Zou et al., 2020), resulting in a higher demand for IT professionals with expertise in digital technologies such as cloud computing, artificial intelligence, and cybersecurity,

The COVID-19 pandemic has disrupted traditional hiring processes and created new challenges in IT talent management. The workforce is already suffering from a skill crisis or a need for a pool of individuals with specialized information technology skill sets (Chapman, 2020). The shift towards remote work has resulted in a broader pool of candidates for IT positions, as companies are no longer restricted to hiring only within their geographic region. Lack of experience is also a barrier to filling vacant positions, causing a low supply but high demand for available professionals (Jordan, 2022), which contributes to skills shortages. IT professionals need to gain the necessary skills to work in the current IT landscape, including credentials or education to help fill the gap, as indicated by Adetoye et al. (2023). Additionally, talent is considering factors other than money when deciding to leave or stay in an organization (Adetoye et al., 2023). Technology leaders should be strategic in retaining critical talent.

However, organizations in need of information technology professionals face another challenge due to a shortage of skilled IT professionals, as the demand for their expertise has risen significantly. This situation has given IT professionals higher bargaining power, making them more likely to seek better career prospects and benefits in other organizations. As a result, competitors use aggressive recruitment techniques, including offering various monetary and non-monetary rewards, to attract and retain the best talent to combat staffing challenges (Heerden et al., 2022). This poses a risk of organizations losing experienced workforce.

Research Methodology

This study is a systematic narrative review of the literature. Searches were conducted using online academic resources (i.e., GALILEO and Google Scholar). A literature review is an essential component of academic research and helps identify gaps to explore. This systematic review describes the guidelines and procedures for the review for a successful review with the following components: planning the review, conducting the review, and reporting the review (Xiao & Watson, 2019). Keywords were used to compile the identified articles and data.

Literature Review Process

The systematic literature review utilized in this article is adapted from Xiao and Watson's (2019) guidance for conducting a systematic literature review. The criteria include formulating a research problem, validating the review protocol validation after development, searching the literature, screening for inclusion, accessing data quality, and extracting data. After extracting data, the process of analyzing and synthesizing data commences. Lastly, the findings are reported (Xiao & Watson, 2019).

Inclusion Criterion The searches used primarily captured literature between 2020-2022 due to the timeframe of COVID-19 as a pandemic. Also, literature relevant in the prior 15-20 years related to IT talent management and burnout was considered.

Literature Identification

Using keywords “information technology pandemic,” “information technology COVID-19,” “IT Professional covid,” “IT management covid,” “IT burnout covid,” “IT burnout,” and “IT management.” In search results, articles were identified by title for relevance. After review of title and key components of the articles were later reviewed for inclusion. Reference information was documented after being determined to be relevant to the literature review. Keywords were inputted into Georgia Library Learning Online (GALILEO) and Google Scholar. Keywords fielded two hundred and fifty-seven articles to continue the review.

Screening for Inclusion

Abstracts were reviewed as the next step in the review of an article. Also, independently reviewing methodology, results, and conclusions for ties to the research topic and questions. A total of two hundred fifty-three articles were narrowed down to review to continue with quality assessment.

Quality and Eligibility Assessment

Full-text articles were used for quality assessment. Review for quality investigated attributes such as peer-reviewed, published, scholarly, authoritative, and the references cited. Conference speeches and non-peer-reviewed articles were omitted unless they were authoritative sources. An authoritative source in this context would be a government entity. Irrelevant articles to research and non-English articles were excluded in this stage of review.

Data Extraction and Analysis

Articles were grouped based on themes and categorized by their relevancy to the research questions. The categories of "pandemic-related IT burnout" and "talent management" helped formulate the research problem, search articles, extraction of data, and locate findings. Articles were scanned for worthy data for extraction to cite using Adobe Acrobat Pro, Microsoft Word, Microsoft Excel, and Beyond Compare.

Results

Of the forty-eight (62) articles selected for review, the majority were from 2020-2023 (the percentage is n = 77.4). Articles before 2020 and the COVID-19 pandemic were included for their relation to information technology management and burnout comparison. The types of research conducted in the articles reviewed included quantitative, qualitative, and mixed methods. Qualitative made up 19.3% of the articles. Quantitative articles were 51.6% of included research, and mixed methods make up 29.1%. Among the articles selected, 67.8% have a relation or mention of COVID-19. Forty-five percent are involved in information technology talent management.

Table 1: Summary of Included Papers

Attributes	Categories	Count	Percentage
Year Published			
	Before 2019	12	19.4
	2019	2	3.2
	2020	26	42.0
	2021	11	17.74
	2022	9	14.5
	2023	2	3.2
	No Date	0	0
Variables of Interest			
Information technology talent management (pandemic)		42	67.8
Information technology professionals, work-life balance (burnout)		20	32.3
Methodology			
Quantitative		32	51.6
Qualitative		12	19.3
Mixed Methods		18	29.1

The key articles were categorized in time burden/burnout (n= 18). The other category is retaining IT talent (n = 22).

Theme 1: Similarities in Work-Life Balance Causing Burnout

Before and after COVID-19, there is an emerging or constant theme of work-life balance involving IT professional burnout. Theme 1 details one of the leading causes of burnout among IT professionals, which is the lack of work-life balance (Weerarathna et al., 2022). Information is summarized in Table 2.

Cook (2006) argues that burnout is influenced by various factors, including job demands and job resources. Additionally, Cook suggests that organizations can develop effective strategies to prevent and manage burnout in their IT workforce by understanding these social representations of burnout.

Pawloski et al. (2004) discussed the findings of IT professionals identifying stressors such as long work hours without backup or coverage during the leave. Responses from study participants included instances of raising the bar in terms of work performance when requesting a reduction in hours to take personal time.

In a study by Kumaresan et al. (2022), forty-five percent of IT professionals suffered from burnout during the pandemic, with women being affected more prevalently than men. The studies indicate that continuous physical and mental health assessment is needed. Additionally, the study found that the prevalence of burnout syndrome was higher among those who reported longer working hours, less support from family and friends, and increased workload due to the pandemic. The study also found that the prevalence of burnout syndrome was higher among those who reported working in larger organizations.

In another study, most IT staff respondents are stressed due to work, do not have enough time for the family due to work pressure, and cannot complete tasks during regular working hours because of working from home during the COVID-19 pandemic (Dhiman, 2023).

Weerarathna et al. (2022) suggest that organizations need to take proactive measures to promote work-life balance among their employees, such as providing flexible work hours and supporting social interactions. Overall, the article provides valuable insights into the impact of working from home on the work-life balance among software engineers during the pandemic and highlights the need for organizations to prioritize employee well-being during these challenging times. Participants are in Sri Lanka and are software engineers during the pandemic

Table 2: Articles reviewed - Theme 1

Author(s)	Year	Contribution
Cook, S. L. S.	2006	Used a mixed methods approach to predict IT professional burnout
Kumaresan, A., Suganthirababu, P., Srinivasan, V., Chandhini, V. Y., Divyalaxmi, P., Alagesan, J., & Prathap, L.	2022	Study of burnout due to pandemic on work from IT professionals.
Pawlowski, S., Kaganer, E., & Cater III, J.	2004	This study interviewed participants to find a central core of social representation of burnout in IT professionals
Weerarathna, R., Rathnayake, N., Yasara, I., Jayasekara, P., Ruwanpura, D., & Nambugoda, S.	2022	The work-life balance involving work from home

Theme 2: Similarities in Work Overload Causing Burnout

Theme 2 identifies work overload as a recurring theme, as narrowed down to four articles in Table 3. The information in the articles shows similarities in the significant impact of work overload both before and after the COVID-19 pandemic.

Brod (1984) examines the negative impact of technology on individuals in the workplace. The author argues that rapid technological advancements can lead to stress and have negative effects on mental and physical health. The literature provides insights into the causes of technostress, with job demands having a significant impact. The author also discusses strategies for reducing technostress in the workplace.

Pawloski et al. (2004) identified projects that can add to the workload or cause a heavy workload, including factors such as project selection, prioritization, planning, and project management. Other factors included unrealistic deadlines in comparison to the project requirements. The authors explore the various dimensions of burnout and how they are perceived by IT professionals using SRT. They suggest that organizations can develop effective strategies to prevent and manage burnout in their IT workforce by understanding these social representations of burnout.

Cook (2006) finds that tasks assumed as "menial" work divert attention away from prioritized or important work, causing burnout, which is strongly observed in the results. These tasks are added to the already assigned workload. Findings suggest that workload is the most significant issue related to burnout.

Kurian & Thomas (2022) surveyed IT professionals and found that the pandemic has led to an increase in perceived stress levels among IT professionals. The study also found that factors such as job demands, and job resources significantly influence perceived stress levels during the pandemic. The article suggests that employers need to take proactive measures to manage work-related stressors and promote employee well-being during the pandemic. Overall, the article provides valuable insights into the impact of the pandemic on the mental health of IT professionals and highlights the need for organizations to prioritize employee well-being during these challenging times.

It is also identified that levels of stress and burnout need to be addressed to achieve work performance (Singh et al., 2022). The study reviews the causes and effects of stress on cybersecurity professionals and highlights the need for further research to identify effective interventions to mitigate stress and improve the well-being of cybersecurity professionals.

Table 3: Articles - Theme 2

Author(s)	**Year**	**Contribution**
Brod, C.	1984	Earlier literature describes technology being introduced in workplaces.
Cook, S.	2006	Used a mixed methods approach to predict IT professional burnout
Pawlowski, S., Kaganer, E., & Cater III, J.	2004	A study that interviewed participants to find a central core of social representation of burnout in IT professionals
Kurian, R. M., & Thomas, S	2022	Study of IT professionals during COVID-19
Singh, T., Johnston, A. C., D'Arcy, J., & Harms, P. D.	2022	Effects of stress on employees include work performance

Theme 3: Similarities in Social Support Causing Burnout.

Another theme in burnout is social support. In this study, social support can be defined as individuals being cared for in terms of affiliation, value, or belonging to a network of communication within an organization (Pearson, 1986).

Pawloski et al. (2004) detail that participants in the study indicated feeling emotional exhaustion due to factors such as panic, deflation, and frustration. Participant responses included not being able to cope with anything due to emotional strain after big projects.

Tarafdar, et al. (2011) explain the use of computer usage in an employee's profession. The phenomenon of technostress can be related to the evolving use of technology or keeping up with the changes. Technostress can cause strains, including impacting the sense of well-being, involvement, and dedication to the occupation. Findings include the need for end-user involvement in innovation and support. Findings also indicate that technostress is a result of the overload of technology in an organization and that organizations should attempt to find ways to cope with stress. They suggest that organizations can mitigate the effects of technostress by providing training, support, and a positive organizational culture.

Nobles (2022) highlights the importance of addressing human factors in cybersecurity to improve employee well-being and prevent burnout, stress, and fatigue. The author suggests that organizations should focus on improving working conditions, providing adequate training and resources, and promoting a culture of well-being to mitigate the negative effects of burnout.

Table 4: Articles reviewed - Theme 3

Author(s)	Year	Contribution
Pawlowski, S., Kaganer, E., & Cater III, J.	2004	The study that interviewed participants to find a central core of social representation of burnout in IT professionals
Tarafdar, M., Tu, Q., & Ragu-Nathan, B. S.	2011	The study involved information before COVID-19 burnout. The article has suggestions for causes and solutions.
Nobles, C.	2022	Highlights support for success in stress and burnout

Theme 4: Key Difference in Causes of Burnout

A difference identified as a theme in burnout highlights an uptick or emerging issue in working from home due to telework for IT employees. Before the pandemic, the literature does not indicate issues or factors of burnout contributing to working from home or telework.

Thathsarani & Praveeni (2021) found in their study that remote work during the pandemic has had both positive and negative effects on work-life balance. On one hand, remote work has provided employees with greater flexibility and autonomy, allowing them to better balance work and personal responsibilities. On the other hand, remote work has also led to longer working hours, increased job demands, and reduced human interaction, negatively impacting work-life balance. The article suggests that organizations should prioritize employee well-being by promoting work-life balance initiatives and providing adequate support and resources for remote workers. Overall, the article provides valuable insights into the impact of remote work on work-life balance during the pandemic and highlights the importance of promoting employee well-being in the IT sector.

The Mehta (2022) study argues that work-from-home-related isolation and loss of task identity have a significant positive relationship with job insecurity, which in turn mediates the relationship between these factors and work alienation. The authors also conclude that the COVID-19 pandemic has resulted in increased work-from-home-related isolation and loss of task identity, which can lead to job insecurity and work alienation. The author suggests that organizations need to take measures to address these issues, such as providing support and resources for remote workers and fostering a sense of connection and belonging among employees.

Table 5: Articles reviewed - Theme 4

Author(s)	Year	Contribution
Thathsarani, N. & Praveeni, S.	2021	Insight on IT employees working from home.
Metha, P.	2022	Working from the home study on burnout during the pandemic.

Theme 5: Similarities in Skills Gap for Talent Management

In this theme, using articles before Covid-19 and after the start of COVID-19, the following indicates similarities in the issue of skill gaps in the information technology sector regarding talent management.

The authors of Kolding et al. (2018) argue that the rapidly changing technological landscape and the increasing amount of data available have created a significant skills gap in IT. The article suggests that organizations need to invest in training and development programs to bridge this gap and ensure that employees have the necessary skills to manage information effectively. The authors also discuss the importance of hiring individuals with a combination of technical and business skills, as well as the need for organizations to foster a culture of information management. The article concludes by emphasizing the importance of IT in today's business environment and the need for organizations to address the skills gap in this area to remain competitive.

In Jordan (2022), the study uses qualitative research methods to explore the challenges faced by organizations in recruiting and retaining cybersecurity talent. The author argues that the cybersecurity skills gap is a complex and multifaceted problem that requires a comprehensive approach to address. The research findings suggest that the skills gap is primarily caused by a lack of cybersecurity talent in the labor market, inadequate training and education programs, and a lack of awareness among potential candidates. The study also highlights the importance of effective recruitment and retention strategies, such as competitive compensation, flexible work arrangements, and professional development opportunities, in attracting and retaining cybersecurity talent. Overall, the article provides valuable insights into the challenges and opportunities in addressing the cybersecurity skills gap and offers recommendations for organizations to build and maintain a skilled cybersecurity workforce.

Table 6: Articles reviewed - Theme 5

Author(s)	Year	Contribution
Jordan, C.	2022	Review of cybersecurity for skill gaps. Identifying issues and solutions in recruitment and retention.
Kolding, M., Sundblad, M., Alexa, J., Stone, M., Aravopoulou, E., & Evans, G.	2018	Skills gap issues identified before the pandemic.

Theme 6: Key Differences in Talent Management

This theme identifies the differences between talent management issues before COVID-19 and after the start of COVID-19. Job satisfaction is highlighted more in pre-pandemic literature, and employee retention is discussed more post-pandemic than talent management. Job satisfaction is vital among IT professionals and is influenced by a complex combination of factors, including work environment and compensation

(Joseph et al., 2007). IT professionals may perceive that their workload, compensation, or opportunities for advancement are unfair, leading to burnout and reduced motivation (Gibson & Cohen, 2003).

Joseph et al. (2007) conducted a narrative review of the literature and meta-analytic structural equation modeling to develop a comprehensive model of IT turnover. The model suggests that job satisfaction, organizational commitment, perceived alternatives, and job embeddedness are the main predictors of IT turnover. The study also found that demographic factors such as age and tenure have a moderating effect on the relationship between these predictors and IT turnover. The article provides valuable insights into the complex nature of IT turnover and offers a framework for understanding the factors that influence turnover among IT professionals. The findings can be useful for organizations in developing strategies to retain their valuable IT talent.

Tarafdar, M., Tu, Q., & Ragu-Nathan, B. S. (2011) analyzed factors that create technostress. Further explains overuse can result negatively in job satisfaction. Rapidly changing technology quickly caused issues with job satisfaction. That is, not only does technostress have adverse behavioral and psychological outcomes, but it also has negative outcomes in the end-user computing domain. The authors explore how technostress, which is the stress experienced by individuals due to technology use, can lead to decreased job satisfaction, lower performance, and increased turnover intention.

Ertürk and Vurgun (2015) conducted a study on the retention of IT professionals and examined the impact of empowerment, social exchange, and trust on the retention of these professionals. The study found that empowering IT professionals by giving them autonomy and decision-making authority can significantly increase their job satisfaction and intention to stay with their organization. Additionally, a positive social exchange, where the organization provides support and recognition to the IT professionals, can also increase their job satisfaction and intention to stay.

Porto Bellini et al. (2019) study focuses on the impact of a crisis on the intention of IT professionals to remain in their jobs or seek alternative employment. The authors surveyed IT professionals in Brazil during a period of political and economic instability and found that job satisfaction, organizational commitment, and perceived job alternatives were significant predictors of intention to stay or leave. The study suggests that organizations can reduce turnover intentions during a crisis by enhancing job satisfaction, commitment, and communication. The article provides valuable insights into the impact of a crisis on the IT workforce and offers recommendations for organizations to retain their valuable IT talent, valued due to another crisis before the pandemic.

The study by Prommegger and Krcmar (2021) examines the impact of workplace social support on turnover intention among IT professionals during the COVID-19 crisis. The study found that workplace social support has a significant negative relationship with turnover intention, indicating that employees who receive more social support from their colleagues and supervisors are less likely to intend to leave their job. The study concludes that organizations should focus on providing social support to their IT professionals during the COVID-19 crisis, as this can lead to reduced turnover intention or improvement in retention.

Papagiannidis et al. (2020) discuss how the pandemic forced many companies to accelerate their digital transformation efforts and highlight the importance of effective IT leadership in managing this process. They argue that successful digital transformation requires collaboration between IT leaders and stakeholders.

Table 7: Articles reviewed - Theme 6

Author(s)	Year	Contribution
Ertürk and Vurgun	2015	Study of IT employee retention before the pandemic.
Joseph, D., Ng, K. Y., Koh, C., & Ang, S.	2007	Narrative review detailing reasons for IT Turnover before the pandemic.
Porto Bellini, C. G., Palvia, P., Moreno, V., Jacks, T., & Graeml, A.	2019	Study of the IT workforce in crisis before the pandemic in Brazil.
Tarafdar, M., Tu, Q., & Ragu-Nathan, B. S.	2011	Revisited earlier articles on technostress and its relation to talent management.
Prommegger & Krcmar	2021	Study of turnover post-pandemic for IT employees.
Papagiannidis, S., Harris, J., & Morton, D.	2020	Reflects on the digital transformation and the challenges in the IT environment to meet rapid change.

Discussion

To help answer the research question finding similarities and differences between burnout and talent management before and after the COVID-19 pandemic. Sub-categories were created from categories detailed in Table 1 to establish six themes. The articles are further narrowed down from articles selected for review and sub-categories created as shown in Table 8. The themes are (1) Similarities in work-life balance causing burnout, (2) Similarities in Work Overload Causing Burnout, (3) Similarities in Social Support Causing Burnout, (4) Key Differences in Causes of Burnout, (5) Similarities in Skills Gap for Talent Management, and (6) Key Differences in Talent Management.

There are common themes that arise from comparing pre-pandemic and post-pandemic categories of burnout in the field of information technology. These common themes include a lack of social support, work-life balance, and work overload. The review reveals that these common themes have been long-standing issues in the information technology field and are similar between the two eras. However, the widespread adoption of remote work because of the pandemic has become a key factor contributing to rapid burnout in the post-pandemic era.

Similarly, there are common themes that emerge from comparing pre-pandemic and post-pandemic categories of talent management in information technology. These common themes relate to the skills gap in the field. However, pre-pandemic literature tends to highlight job satisfaction more, while post-pandemic literature focuses more on employee retention in talent management. Nevertheless, it is important to recognize that there may be common factors underlying these differences that can be further explored.

This research indicates that burnout in the field of information technology has been a significant issue both before and after the pandemic, requiring attention and action from organizations and individuals within the industry. Even in the post-pandemic era, the new normal of increased workload and remote work has further exacerbated the issue.

Table 8: Summary of Sub-Categories to Identify Themes

Sub-Category	Authors	Number of articles
Causes of burnout post-pandemic	(Ågerfalk, et al., 2020; Arshad, 2020; Dhiman, 2023; Felstead & Reuschke, 2021; Hai et al, 2021; Kamal, 2020; Kaushik & Guleria, 2020; Kudyba, 2020; Kumaresan et al., 2022; Mangla, 2021; Metha, 2022 ; Ninaus, et al., 2021; Nobles, 2022; Pandey & Pal, 2020; Sharma,et al., 2020; ;Singh, et al., 2020; Thathsarani, & Praveeni, 2021; Weerarathna,et al., 2020).	18
causes of burnout pre-pandemic	(Brod, 1984; Cook, S. L. S., 2006; Moore, J, 2000; Pawlowski et al, 2004; Spector et al., 2011; Tarafdar et al., 2011).	6
challenges of talent management post-pandemic	(Ågerfalk,et al., 2020; Arshad, 2020; Chakraborty & Kar, 2021; Dhiman, A. 2023; Felstead & Reuschke, 2021; Hai et al, 2021; Heerden et al., 2022; Herath & Herath, 2020; Jordan, 2022; Idell, 2020; Kamal, 2020; Kaushik & Guleria, 2020; Kudyba, 2020; Mangla, 2021; Ninaus, et al., 2021; Nobles, 2022; Pandey & Pal, 2020; Papagiannidis et al., 2020; Prommegger & Krcmar; Reuschi et al., 2022; Sharma,et al., 2020; ;Singh, et al., 2020; Thathsarani, & Praveeni, 2021; Weerarathna,et al., 2020)	23
challenges of IT talent management pre-pandemic	(Ertürk & Vurgun, 2015; Gibson & Cohen, 2003; Joseph et al, 2007; Kolding et al, 2018; Porto Bellini et al., 2019; Tarafdar et al, 2011)	6

Conclusion

In conclusion, there are many similarities in the pre-COVID-19 and post-COVID-19 eras regarding burnout and talent management in the information technology workforce. It can be concluded that burnout has been a longstanding problem, and talent management has been a persistent issue, with the pandemic adding new challenges to the existing problems, particularly in terms of adapting to rapid innovation, remote work, and work-life balance during burnout in the post-pandemic era.

Implications and Recommendations

To address the issue of IT burnout in the post-pandemic era, there are several potential solutions that organizations and individuals can implement. These may include providing adequate resources and support for IT professionals to manage their workload and promote a healthy work-life balance. This could involve offering flexible work arrangements, providing mental health resources and support, and ensuring that IT professionals have access to the necessary tools and technology to perform their jobs effectively. Organizational and supervisor support can also play a crucial role (Thathsarani & Praveeni, 2021).

Encouraging IT professionals to take breaks and prioritize self-care can help prevent burnout and maintain their mental and physical health.

In addition, there may be a need for training and activities to help employees adapt to the new ways of working. Front-facing or frontline IT personnel are highly valued in the post-pandemic job market, and companies should proactively use social support to retain their qualified IT staff during and after crises, as such support can mitigate workload overload and time pressure (Progemmer & Kremar, 2021). Organizations have also learned valuable lessons from the COVID-19 pandemic about the role of IT in facilitating business continuity (Wang et al., 2021).

A talent management strategy that many companies have adopted is to prioritize upskilling and reskilling their existing IT workforce. This approach not only addresses the skills gap but also helps companies retain their existing talent (Singh et al., 2020). Another strategy that companies have employed is leveraging technology to improve their IT talent acquisition process. This includes using video conferencing tools for virtual interviews and assessments and using artificial intelligence to screen resumes and identify qualified candidates (Vardarlier & Zafer, 2020). It is also recommended that organizational leaders review job satisfaction in work-from-home situations (Dhiman, 2023), and consider the benefits of post-pandemic culture such as telecommuting in addressing talent management issues related to retention and recruitment.

References

Adetoye, B., & Fong, R. C. W. (2023). Building a Resilient Cybersecurity Workforce: A multidisciplinary solution to the Problem of high turnover of cybersecurity analysts. In *Cybersecurity in the Age of Smart Societies: Proceedings of the 14th International Conference on Global Security, Safety and Sustainability, London, September 2022* (pp. 61-87). Springer International Publishing.

Adedoyin, O. B., & Soykan, E. (2020). COVID-19 pandemic and online learning: the challenges and opportunities. *Interactive Learning Environments*, 1-13.

Ågerfalk, P. J., Conboy, K., & Myers, M. D. (2020). Information systems in the age of pandemics: COVID-19 and beyond. *European Journal of Information Systems*, *29*(3), 203-207.

Arshad, M. (2020). COVID-19: It's time to be thankful to our ICT professionals. *Information Technology & Electrical Engineering*, *9*(2), 23-31.

Barnes, S. J. (2020). Information management research and practice in the post-COVID-19 world. *International Journal of Information Management*, *55*, 102175.

Brod, C. (1984). *Technostress: The human cost of the computer revolution.* Addison-Wesley.

Chakraborty, A., & Kar, A. (2021). How did COVID-19 impact working professionals a typology of impacts focused on the education sector? *The International Journal of Information and Learning Technology*. 38(3), 273-282.

Chapman, P. (2020). Are your IT staff ready for the pandemic-driven insider threat?. *Network Security*, 2020(4), 8-11.

Ciotti, M., Ciccozzi, M., Terrinoni, A., Jiang, W. C., Wang, C. B., & Bernardini, S. (2020). The COVID-19 pandemic. *Critical reviews in clinical laboratory sciences*, 57(6), 365-388.

Cook, S. L. S. (2006). *Explaining burnout: A mixed method investigation of information technology workers* [Doctoral dissertation, Capella University]. ProQuest Dissertations Publishing.

Dhiman, A. (2023). Worklife balance in the shadow of the pandemic-with due consideration to its companies. [Unpublished manuscript]. NICE School of Business Studies, Shobhit Institute of Engineering and Technology.

Ertürk, A., & Vurgun, L. (2015). Retention of IT professionals: Examining the influence of empowerment, social exchange, and trust. *Journal of Business Research*, *68*(1), 34-46.

Felstead, A., & Reuschke, D. (2021). A flash in the pan or a permanent change? The growth of homeworking during the pandemic and its effect on employee productivity in the UK. *Information Technology & People*, 2021(6).

Gibson, L., & Cohen, S. G. (2003). *Virtual teams that work: Creating conditions for virtual team effectiveness.* Jossey-Bass.

Hai, T. N., Van, Q. N., & Thi Tuyet, M. N. (2021). Digital transformation: Opportunities and challenges for leaders in the emerging countries in response to COVID-19 pandemic. *Emerging Science Journal*, 5(1), 21-36.

Herath, T., & Herath, H. S. (2020). Coping with the new normal imposed by the COVID-19 pandemic: Lessons for technology management and governance. *Information Systems Management*, *37*(4), 277-283.

Idell, K. (2020). *Information Technology Professionals-Linking Trust and Turnover Intention* [Doctoral dissertation, Drexel University]. ProQuest Dissertations Publishing.

Jinhyun, C. H. O., Yoo, J., & Lim, J. I. (2020). An Impact Analysis of Information Security Professional's Job Stress and Job Satisfaction to Turnover Intention: Moderation of Organizational Justice. *Journal of Society for e-Business Studies*, *24*(3), 143-161.

Jordan, C. A. (2022). *Exploring the cybersecurity skills gap: A qualitative study of recruitment and retention from a human resource management perspective* [Doctoral dissertation, Northcentral University]. ProQuest Dissertations Publishing.

Joseph, D., Ng, K. Y., Koh, C., & Ang, S. (2007). Turnover of information technology professionals: A narrative review, meta-analytic structural equation modeling, and model development. *MIS Quarterly*, 31(3). 547-577.

Kamal, M. M. (2020). The triple-edged sword of COVID-19: understanding the use of digital technologies and the impact of productive, disruptive, and destructive nature of the pandemic. *Information Systems Management*, *37*(4), 310-317.

Kansal, M. (2021). The impact of COVID-19 on organizational culture and employee engagement: exploratory research on information technology (IT) professionals in Delhi/NCR (India). *Journal of Xi'an University of Architecture and Technology*, 13(1), 68-77.

Kaushik, M., & Guleria, N. (2020). The impact of pandemic COVID-19 in workplace. *European Journal of Business and Management*, *12*(15), 1-10.

Kim, S., & Wright, B. E. (2007). IT employee work exhaustion: Toward an integrated model of antecedents and consequences. *Review of Public Personnel Administration*, *27*(2), 147-170.

Kolding, M., Sundblad, M., Alexa, J., Stone, M., Aravopoulou, E., & Evans, G. (2018). Information management–a skills gap? *The Bottom Line*, 31(3), 170-190.

Korn, E. B., Fletcher, D. M., Mitchell, E. M., Pyke, A. A., & Whitham, S. M. (2021). Jack pandemus–Cyber incident and emergency response during a pandemic. *Information Security Journal: A Global Perspective*, *30*(5), 294-307.

Kudyba, S. (2020). COVID-19 and the Acceleration of Digital Transformation and the Future of Work. *Information Systems Management*, *37*(4), 284-287.

Kurian, R. M., & Thomas, S. (2022). Perceived stress among information technology professionals in India during the COVID-19 pandemic. *Theoretical Issues in Ergonomics Science*, *23*(2), 182-198.

Kumaresan, A., Suganthirababu, P., Srinivasan, V., Chandhini, V. Y., Divyalaxmi, P., Alagesan, J., & Prathap, L. (2022). Prevalence of burnout syndrome among work-from-home IT professionals during the COVID-19 pandemic. *Work*, 71(2).

Mangla, N. (2021). Working in a pandemic and post-pandemic period–Cultural intelligence is the key. *International Journal of Cross Cultural Management*, *21*(1), 53-69.

Maudgalya, T., Wallace, S., Daraiseh, N., & Salem, S. (2006). Workplace stress factors and burnout among information technology professionals: A systematic review. *Theoretical Issues in Ergonomics Science*, *7*(3), 285-297.

Moore, J. E. (2000). One road to turnover: An examination of work exhaustion in technology professionals. *MIS Quarterly*, 24(1), 141-168.

Mykytyn, P. P. (2020). COVID-19 and its impacts on managing information systems. *Information Systems Management*, *37*(4), 267-271.

Ninaus, K., Diehl, S., & Terlutter, R. (2021). Employee perceptions of information and communication technologies in work life, perceived burnout, job satisfaction and the role of work-family balance. *Journal of Business Research*, *136(1)*, 652-666.

Nobles, C. (2022). Stress, burnout, and security fatigue in cybersecurity: A human factors Problem. *Journal of Business and Public Administration*, 13(1), 49-72.

Pawlowski, S.D., E.A. Kaganer, and J.J. Cater (2004) "Mapping Perceptions mf Burnout in the Information Technology Profession: A Study Using Social Representations Theory," in Agarwal, R., L. Kirsch, and J.I. DeGross (eds.) *Proceedings of the 25th International Conference on Information Systems,* Washington, DC, (pp. 901-913).

Pan, S. L., & Zhang, S. (2020). From fighting COVID-19 pandemic to tackling sustainable development goals: An opportunity for responsible information systems research. *International journal of information management*, 55(1), 102196.

Pandey, N., & Pal, A. (2020). Impact of digital surge during COVID-19 pandemic: A viewpoint on research and practice. *International journal of information management*, *55(1)*, 102171.

Papagiannidis, S., Harris, J., & Morton, D. (2020). WHO led the digital transformation of your company? A reflection of IT related challenges during the pandemic. *International journal of information management*, *55*, 102166.

Pearson, J. E. (1986). The definition and measurement of social support. *Journal of Counseling & Development*, *64*(6), 390-395.

Perrin, S., & Wang, L. (2021). COVID-19 and rapid digitalization of learning and teaching: quality assurance issues and solutions in a Sino-foreign higher education institution. *Quality Assurance in Education*, *29*(4), 463-476.

Porto Bellini, C. G., Palvia, P., Moreno, V., Jacks, T., & Graeml, A. (2019). Should I stay or should I go? a study of IT professionals during a national crisis. *Information Technology & People*, *32*(6), 1472-1495.

Prommegger, B., & Krcmar, H. (2021). Through good times and bad: The influence of workplace social support on IT professionals' turnover intention during the COVID-19 crisis. In *Proceedings of the 2021 on Computers and People Research Conference* (pp.13-21).

Reuschl, A. J., Deist, M. K., & Maalaoui, A. (2022). Digital transformation during a pandemic: Stretching the organizational elasticity. *Journal of Business Research*, 144(1), 1320-1332.

Sharma, M. K., Anand, N., Ahuja, S., Thakur, P. C., Mondal, I., Singh, P.,& Venkateshan, S. (2020). Digital burnout: COVID-19 lockdown mediates excessive technology use stress. *World Social Psychiatry*, 2(2), 171.

Singh, M. K., Kumar, V., & Ahmad, T. (2020). Impact of COVID-19 pandemic on working culture: exploratory research among information technology (IT) professionals in Bengaluru, Karnataka India. *Journal of Xi'an University of Architecture & Technology*, *12*(5), 3176-3184.

Singh, T., Johnston, A. C., D'Arcy, J., & Harms, P. D. (2022). Stress in the cybersecurity profession: a systematic review of related literature and opportunities for future research. *Organizational Cybersecurity Journal: Practice, Process and People,* 1(1), 1-11.

Spector, P. E., Cooper, C. L., & Sparks, K. (2011). *Occupational health psychology*. John Wiley & Sons.

Tarafdar, M., Tu, Q., & Ragu-Nathan, B. S. (2011). Impact of technostress on end-user satisfaction and performance. *Journal of Management Information Systems*, 28(3), 303-334.

Thathsarani, N. A. N., & Praveeni, S. M. N. (2021). Impact of work from home on work-life balance during COVID-19: A study on ICT sector employees in Western Province, *Sri Lanka. Age*, 189(191), 49-7.

University of Southern California Libraries (n.d.). *Research Guides*. https://libguides.usc.edu/c.php?g=235208&p=1560699#:~:text=Non%2Dscholarly%20materials%20are%20legitimate,%2C%20use%20non%2Dscholarly%20sources.

Urbach, N., Ahlemann, F., Böhmann, T., Drews, P., Brenner, W., Schaudel, F., & Schütte, R. (2019). The impact of digitalization on the IT department. *Business & information systems engineering*, 61(1), 123-131.

Van Heerden, J., Du Plessis, M., & Becker, J. R. (2022). Walking the tightrope of job demands and resources: Leveraging work engagement to counter turnover intentions ofinformation technology professionals. *Frontiers in Psychology*, 13(1), 1-13.

Vardarlier, P., & Zafer, C. (2020). Use of artificial intelligence as business strategy in recruitment process and social perspective. *Digital Business Strategies in Blockchain Ecosystems: Transformational Design and Future of Global Business*, (pp. 355-373). Springer International Publishing.

Wang, X., Li, Y., Stafford, T. F., & Xin, D. (2021). The IT labor market amid the pandemic: the case of the united states. *IEEE Engineering Management Review*, *49*(4), 41-53.

Weerarathna, R., Rathnayake, N., Yasara, I., Jayasekara, P., Ruwanpura, D., & Nambugoda, S. (2022). Towards work-life balance or away? The impact of work from home factors on work-life balance among software engineers during COVID-19 pandemic. *Plos one*, 17(12), 1-21.

Xiao, Y., & Watson, M. (2019). Guidance on conducting a systematic literature review. *Journal of planning education and research*, *39*(1), 93-112.

Zou, C., Zhao, W., & Siau, K. (2020). COVID-19 calls for remote reskilling and retraining. *Cutter business technology journal*, *33*(7), 21-25.