

Theoretical and Practical Implications for Management Employees' Healthcare Practices for Enhancing Workplace Productivity

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ABSTRACT

Business companies' employees' healthcare practices are critical in organizational development and progress. Addressing healthcare-related workplace problems is essential due to their significant economic impact. The economy experiences a productivity loss of \$1 trillion annually due to, for instance, mental health disorders. The World Health Organization emphasizes the value of mental health measures. Healthcare issues affect businesses at all organizational levels, often exacerbated by stigma, which discourages employees from seeking help due to fear of judgment or job insecurity. Mental health conditions result in lost workdays, decreased performance, increased turnover, and higher medical costs for companies. Traditional health assessments often miss subtle mental health conditions, leading to incomplete care. Reactive workplace approaches address issues only when they become major, failing to support employees adequately and resulting in substantial annual asset losses. The absence of mental health support programs contributes to a toxic work environment, reducing overall employee morale and engagement. This study investigates the application of Single Photon Emission Computed Tomography (SPECT) imaging to improve mental health diagnoses in the workplace. By utilizing innovative diagnostic technology, businesses can recapture lost productivity costs associated with untreated mental health issues. Theoretical and practical implications for employees' mental health and innovative behavior in organizations were discussed in this paper.

Keywords: Healthcare, workplace, employee productivity, innovative diagnostic approach.

1. Introduction

Mental health is a critical aspect of organizational development and progress, emphasizing the importance of addressing workplace mental health issues due to their significant economic impacts (Wykes et al., 2025). Mental health disorders result in a productivity loss of \$1 trillion annually (Arias et al., 2022). The economic burden of these issues is further highlighted by the World Health Organization (WHO), which underscores the value of mental health measures (WHO, 2012), particularly in the aftermath of COVID-19.

Mental health issues are a significant challenge for businesses, affecting all levels of an organization. The stigma surrounding mental health often exacerbates the problem, as employees hesitate to seek help due to fear of judgment or job insecurity. Mental health conditions lead to more lost workdays, decreased work performance, higher turnover, and increased company medical costs. Traditional health assessments often fail to identify these subtle conditions, resulting in incomplete care and management. Most workplaces have taken a reactive approach, addressing issues only when they escalate into major problems. This approach not only fails to support employees but also results in significant asset loss annually. The absence of mental health support programs has created a toxic work environment, lowering overall employee morale and engagement (Reinert, 2022).

This study demonstrates how businesses can recapture lost productivity costs from untreated mental health issues by using innovative diagnostic technologies like SPECT imaging. These technologies have the potential to not only enhance employee productivity, efficiency, and loyalty but also positively impact their

children, as employees who are happier and more stable would influence their families in a beneficial way (de Oliveira et al., 2023).

This study explores the application of Single Photon Emission Computed Tomography (SPECT) imaging to improve mental health diagnoses, with the goal of enhancing the management of mental health in the workplace.

The structure of the paper consists of six sections. The first section provides the introduction. The second section presents the results of the literature review. The third section focuses on current diagnostic approaches. The fourth section introduces innovative approach methods. The fifth section is dedicated to current management practices. Finally, the sixth section presents the conclusions.

2. Literature Review

This section covers the prevalence and economic impact of mental health issues in the workplace, current treatment methods, and innovative approaches such as SPECT imaging and artificial intelligence in mental health diagnostics.

2.1. Bibliometric Analysis of Literature and Mental Health Actuality for Business

Using the keyword "mental health," the authors conducted a bibliometric analysis, which revealed a single cluster containing keywords such as stress factor, COVID, safety, negative impact, and others (Wong et al., 2023). The results of the bibliometric analysis are presented below in Figure 1.

Some studies highlight the importance of mental health in business, but the number of such papers is limited and was not included in the bibliometric analysis output. For example, Miller et al. (2020) and Greenwood et al. (2021) discuss the significance of mental health for business.

In fact, employees do not experience mental health issues in isolation, and the company's role in employee mental health is crucial. Both supportive and unsupportive employers can have an impact. Several factors in the workplace negatively affect mental health (APA, 2024a). Until recently, discussions have primarily focused on existing mental disorders and the stigma associated with them. However, there is now growing attention on the broader impact of work on mental health. A majority (84%) of respondents cited at least one workplace factor that negatively affected their mental health (Greenwood et al., 2021). Younger workers and members of underrepresented groups are particularly affected. Among all respondents, the most common factor was emotionally debilitating work (e.g., stressful, depressing, boring, or monotonous), which worsened after the pandemic. Work-life balance also emerged as a significant concern (APA, 2024b). Other workplace factors exacerbated by the pandemic included poor communication practices and lack of communication with colleagues and managers, as well as lack of support—issues that became particularly pronounced with remote work. Workaholism, a feature of much of American culture, was intensified by the pandemic, leading to increased employee burnout. Companies have increased investment in their employees' mental health, though there has yet to be a fundamental cultural shift. Respondents noted that many employers have improved access to resources since the pandemic began, such as additional paid time off, company-wide mental health days, and mental health education (Greenwood et al., 2021). Additionally, employees benefited from housing opportunities that provided day-to-day support, such as longer or more frequent breaks and visits to medical facilities during the workday. However, the occupancy of remaining facilities, including public holidays and leave days, remained unchanged compared to 2019. This highlights the contrast between employee spending and the costs offered by employers, which often remained short-term benefits.

In fact, for 31% of respondents, a more open culture about mental health was the most sought-after source of support (Greenwood et al., 2021). Societies have made progress in the area of cultural change. While much remains to be done, some companies have made significant strides in cultural improvements that may have been accelerated by the pandemic. Fifty-four percent of respondents now believe that mental health is more important than other organizational priorities, up from 41% in 2019 (Greenwood et al., 2021). Additionally, 47% of respondents feel their managers are committed to supporting their mental health at work, an increase from 37% in 2019, and 47% believe their manager would support them if they experienced mental illness or symptoms, up from 39% in 2019 (Greenwood et al., 2021). These are potentially positive outcomes, reflecting better education and discussion about mental health (Elsevier, 2023). However, paradoxically, this increased understanding did not manifest in all areas. The number of respondents who felt they wanted to support the mental health of their coworkers dropped by 5%, and a similar percentage reported knowing the correct process for maintaining mental health at work. Employers who have supported their employees during the pandemic, as well as in areas such as racial inequities, return-to-office planning, and mental health, tend to see better mental health and engagement outcomes.

For cultural change to be successful, both top-down and bottom-up strategies are necessary. Mind Share's ecosystem of mentally healthy workplaces demonstrates that everyone has a role to play, starting with managers and leaders. Leaders should prioritize mental health through accountability mechanisms, such as regular assessments and a clear division of responsibilities. They should also act as allies, sharing personal experiences to foster an environment of openness and integrity. Without an open culture, even the societies with the greatest mental health benefits will not see an increase in physical activity due to fear and shame. Companies must educate managers, supervisors, and all employees on how to manage mental health in the workplace, engage in meaningful conversations, and create supportive environments.

Last but not least, there is a culture of communication, ranging from mere mercenaries who leave time to ask "How are you?" to healthy work relationships and meaningful communication between teams. Employers should create conditions for communication within the company and encourage continuous and detailed conversations between managers, direct messages, and colleagues. Significant changes in the company have transformed its culture and employees' perception of mental health. Employers have started to invest more, but employees have legally increased their expectations. The future of mental health at work requires cultural changes: greater sensitivity, compassion, and sustainable ways of working. Due to COVID-19, we are already on the path of cultural change. Let us take the opportunity to focus on new ways of working instead of returning to the status quo of 2019.

2.2. Prevalence and Economic Impact

The World Health Organization has estimated that mental health disorders, particularly depression and anxiety, result in economic losses of approximately \$1 trillion each year due to reduced productivity. The magnitude of this issue necessitates the implementation of effective management strategies.

A comprehensive analysis from the Mental Health Foundation highlights that in the UK, businesses incur specific costs related to mental health problems amounting to approximately 26 billion pounds per year. This underscores the need for investment in better workplace mental health resources and diagnostic tools. Additionally, the role of the work environment in influencing employees' mental health cannot be overlooked (NECA Minneapolis, 2023).

In fact, a study in the Harvard Business Review even cited how toxic workplace cultures significantly contribute to mental health problems, which stem from employees' low morale and productivity. Additionally, leadership style has an immense impact on mental health in the workplace (Amen et al., 2018).

The American Psychological Association recently published research on how remote work impacts mental health, along with guidelines for companies on various ways to successfully support employees who work off-site.

With the growing trend of modern workplaces shifting towards remote work, the need for technological solutions to support employees' mental health cannot be underestimated (Henderson et al., 2020).

3. Current Diagnostic Approaches

This section includes the current diagnostic and treatment, self-reporting questionnaires and screening tools, clinical interviews, and traditional treatment approaches and their limitations.

Self-report questionnaires and screening tools. Self-report questionnaires are among the most commonly used tools to screen for mental health conditions in workplace settings. The Patient Health Questionnaire (PHQ-9) and the Generalized Anxiety Disorder Scale (GAD-7) are frequently employed to assess symptoms of depression and anxiety, respectively (Levis et al., 2019). Both tools rely on individuals' subjective assessment of their symptoms, which can lead to underreporting due to stigma or lack of self-awareness (Mughal et al., 2020).

Interviews. Clinical interviews remain the gold standard for diagnosing mental health disorders. Conducted by licensed mental health professionals, these structured or semi-structured interviews follow specific diagnostic criteria, enabling a comprehensive evaluation of symptoms, history, and functioning.

However, clinical interviews require significant time, expertise, and financial resources. They also rely on the patient's willingness to disclose sensitive information. Additionally, personal biases and subjective interpretation can impact the accuracy of the diagnosis (Balogh et al., 2015). These limitations often result in delayed or incorrect diagnoses, leading to ineffective treatment plans (Mughal et al., 2020).

Traditional treatment approaches. Cognitive Behavioral Therapy (CBT) is one of the most established and effective therapeutic interventions for mental health disorders. It is based on the idea that thoughts, feelings, and behaviors are interconnected, and that changing negative thought patterns can positively influence emotional states and behaviors.

CBT involves identifying negative thoughts and replacing them with positive, realistic ones. It is particularly effective for conditions like depression, anxiety, Post-traumatic Stress Disorder (PTSD), and Obsessive-Compulsive Disorder (OCD). Despite its efficacy, access to qualified therapists is limited, and adherence to treatment plans remains challenging for many patients. Additionally, CBT requires consistent effort and engagement from individuals, which can be difficult for those experiencing severe symptoms (Sunderland et al., 2019).

Medications such as antidepressants, anti-anxiety drugs, and mood stabilizers are widely prescribed for mental health conditions. They can provide symptom relief, especially when used alongside psychotherapy. However, their effectiveness varies significantly among individuals, and mental health medications are not suitable for everyone. The side effects can be severe, ranging from weight gain, sexual dysfunction, and nausea to anxiety, dizziness, and brain zaps in some cases (Sunderland et al., 2019).

Limitations of traditional diagnostic approaches. Inaccuracy in diagnosis is one of the most significant challenges, particularly when addressing mental health issues in the workplace, and traditional diagnostic methods are relatively imprecise. Tools like self-report questionnaires and clinical interviews rely heavily on individuals' subjective reporting of symptoms, which can lead to inaccuracies in diagnosis. Employees may feel stigmatized, fear discrimination, or be unaware of their symptoms, contributing to these inaccuracies.

In Ethiopia, up to 39% of individuals with severe psychiatric disorders were misdiagnosed. In fact, in over half of the cases where participants were diagnosed with major depressive disorder (MDD), the diagnosis was incorrect, and they were misdiagnosed with another mental health condition, such as schizophrenia or bipolar disorder. This highlights the difficulty of relying solely on clinical interviews and questionnaires for accurate diagnosis. Ayano et al. (2021) emphasize the urgent need to transition to more accurate methods of conducting diagnoses.

A survey of mental health clinicians revealed that more than 50% reported a high likelihood of assigning a schizophrenia diagnosis, even when the clinical picture did not meet the Diagnostic and Statistical Manual of Mental Disorders (DSM) criteria. Additionally, 49.7% of clinicians disagreed with the diagnosis, even when the patient's symptoms met the criteria. This suggests that diagnostic decisions are highly variable and largely subjective (Raskin & Gayle, 2016).

Another study published in the *Journal of the American Medical Association* reveals that up to one-third of patients diagnosed with major depressive disorder may actually have bipolar disorder, which requires a different treatment approach (Trogakos et al., 2020). Most traditional treatments take a generalized approach rather than being tailored to individual needs (Rogers, 2023). While CBT and medication are effective for many, they may not work for others due to differences in genetics, environment, or coexisting conditions. Personalized treatment requires a detailed understanding of an individual's mental health profile, including brain activity patterns, genetic predisposition, and lifestyle factors. However, traditional diagnostic methods often fail to capture this level of detail, resulting in trial-and-error treatment approaches (Hu et al., 2014; Ren et al., 2014).

4. Innovative Approach Methods

The discovery of mental illness through the application of innovative research methods is an essential area of research. We will look at several vital methods.

Machine learning methods. Machine learning (ML) methods are increasingly recognized for their ability to detect, diagnose, and treat mental illness. Researchers have explored various machine learning algorithms to study human behavioral patterns, identify symptoms, predict disease progression, and provide personalized treatment.

However, challenges remain, including the need to develop effective money laundering apps that can be implemented. A systematic review of the human-computer interaction (HCI) literature identified trends, shortcomings, and problems in this area, emphasizing the importance of an interdisciplinary, human-centered approach (Abd Rahman et al., 2020).

Deep Learning methods. To identify mental disorders, researchers examined physiological symptoms such as electroencephalogram (EEG), heart rate, and skin conductance. Properties like wavelength entropy, wavelength relative energy, and transpunctular asymmetry were excluded by using machine learning algorithms, such as Linear Discriminant Analysis (LDA), and deep learning techniques like Multi-Layered Perceptron Neural Networks (MLPNN) (Su et al., 2020). These methods are designed to provide objective and non-invasive ways to assess mental health.

Integrated approach methods. The development of information technology, automated data collection, and big data analytics has led to an integrated approach to mental health prevention. These approaches include a variety of technologies to effectively monitor and manage mental health, such as mobile devices and mobile applications. Artificial intelligence (AI) could also be integrated into these methods (Kalyoncu & Gonul, 2021).

While AI offers significant potential, it is crucial to consider its ethical implications. Models and interventions must be designed with mental health in mind to ensure they are applicable in real-world scenarios. It is vital to prioritize interpretation, fairness, and privacy (Tutun et al., 2023).

Overall, the innovative research methods involve a combination of machine learning, physiological symptoms, and digital medical technologies. As this field evolves, interdisciplinary collaboration and ethical awareness are crucial for advancing mental health discovery and care (Carr, 2020).

Further, this section includes SPECT imaging and the future outlook for the fusion of SPECT and artificial intelligence.

4.1. SPECT Imaging

Single Photon Emission Computed Tomography (SPECT) is an advanced neuroimaging technology that provides valuable insights into brain activity and function (Camargo, 2001).

SPECT directly visualizes the brain, providing a functional map of blood flow and brain activity. By highlighting abnormalities in specific brain areas, SPECT imaging can identify patterns associated with mental health disorders such as depression, anxiety, and PTSD (Vázquez-Abad et al., 2020).

SPECT imaging involves injecting a radioactive tracer into the bloodstream. This tracer emits gamma rays, which a gamma camera detects to create three-dimensional images of brain activity. The images are color-coded to reflect varying blood flow levels, with regions showing reduced or increased blood flow compared to normal activity, indicating areas of potential concern. For instance, decreased blood flow in the prefrontal cortex may correlate with symptoms of depression (Xiao et al., 2024). The value of SPECT imaging lies in its ability to reveal functional abnormalities that other diagnostic methods cannot detect. Unlike Computed Tomography (CT) or Magnetic Resonance Imaging (MRI), which primarily provide structural imaging, SPECT highlights functional issues that may underline various mental health disorders. This distinction is critical, as many mental health conditions stem from functional rather than structural problems. By directly observing brain function, clinicians can tailor treatment strategies to each patient's specific needs.

Clinical research, particularly by Dr. Daniel Amen and other practitioners, supported by over 200,000 scans collected over 30 years, has demonstrated the efficacy of SPECT imaging in improving diagnosis and treatment outcomes (Lazzarino et al., 2011). For example, SPECT scans can reveal distinct patterns in the brains of individuals with depression, such as increased activity in the limbic system and decreased activity in the prefrontal cortex. Similarly, various forms of anxiety show specific patterns of increased or decreased brain activity (Mental Health Daily, 2023), with PTSD often displaying hyperactivity in the amygdala, a region involved in fear and emotional responses. According to a report from the Amen Clinics, 80% of cases had a change in diagnosis or treatment after adding a SPECT scan. Over 20% of the cases revealed unexpected brain injuries, while more than 20% showed unexpected toxicity. These findings led to medication or supplement prescription changes in 60% of cases, highlighting the significant role of SPECT imaging in providing more accurate and effective patient care.

4.2. The use of Artificial Intelligence in mental health research area

AI can have a significant impact on mental health care and research.

AI plays a significant role in the early detection of potential mental health problems. AI algorithms can identify potential risk factors or symptoms by analyzing data patterns on social media, such as news, language, or physiological cues (D'Alfonso, 2020).

NLP methods enable AI systems to analyze and understand human language. In the field of mental health, NLP can assist doctors by extracting meaningful information from patient conversations, clinical notes, and other textual data. This helps in diagnosing the disease and recommending appropriate treatment (Graham et al., 2019).

AI-based virtual reality (VR) experiences can replicate therapeutic environments for patients. For example, the treatment of PTSD can be conducted in a controlled VR environment, gradually exposing patients to situations that challenge them and help them confront their fears (Bell et al., 2020).

AI can analyze big data to tailor treatment plans to individual needs. By considering factors such as genetics, lifestyle, and treatment history, AI algorithms can recommend personalized interventions (Tornerio-Costa et al., 2023).

AI-powered chatbots and apps provide mental health insights, coping strategies, and emotional support. These tools are available anytime, anywhere, and provide valuable resources for those seeking help.

However, it is vital to recognize the challenges (Thieme et al., 2023). Recent research shows that the use of AI in mental health research is unbalanced, with a particular focus on studies of depressive disorders and schizophrenia. There is a lack of understanding regarding how AI can be applied to treat other mental health issues.

AI encompasses sophisticated statistical methods and large amounts of data. Poor management of these aspects can lead to bias, inaccurate results, and an overly optimistic approach to AI performance.

AI can be used to determine mental health, and careful assessments and ethical aspects are required to ensure effective and responsible use.

4.3. Artificial Intelligence Analysis in SPECT Imaging

Medical imaging with artificial intelligence is a rapidly evolving field, and its integration with SPECT imaging holds the greatest promise for advancing mental health diagnostics. By using machine learning algorithms and deep neural networks, AI can analyze complex brain patterns to provide highly accurate identifications of disorders linked to mental health. The primary goal of integrating AI with SPECT imaging is to automate

and precisely diagnose specific patterns that correlate with certain mental health conditions. AI-trained models, based on large databases of SPECT images, can learn to recognize brain activity patterns characteristic of disorders such as depression, anxiety, PTSD, and attention deficit hyperactivity disorder (ADHD). As the size and adaptability of this database grows, the model's diagnostic accuracy will improve, enabling it to recognize finer distinctions between different conditions (Chen et al., 2023).

These findings suggest that businesses should allocate a portion of their annual productivity losses to enhance accessibility to SPECT imaging technology. Such an investment would not only improve employee loyalty and productivity but also potentially increase overall income. Additionally, the recent advancements in artificial intelligence (AI) make this investment even more appealing. By training AI and machine learning algorithms to diagnose mental health conditions using SPECT imaging, businesses can streamline the process and reduce costs associated with incorporating this technology into the workplace. With access to the extensive archive of images collected by Dr. Amen, AI can be trained to provide fast and accurate diagnoses. This integration promises to significantly improve workplace mental health management in an efficient and effective manner.

5. Current Management Practices for Mental Health in the Workplace

Mental health benefits and support practices. The availability of mental health benefits and support programs plays a crucial role in identifying and addressing mental health issues in the workplace. Many Employee Assistance Programs (EAPs) offered by organizations provide confidential counseling, referrals, and support to employees dealing with personal and/or work-related challenges. These programs can include access to mental health professionals, on-site stress management activities, and resources for addressing symptoms of anxiety, depression, and other mental health concerns. According to Milliman, 94% of employers provide at least some mental health resources, and 73% consider these resources vital for attracting and retaining employees.

Another major lever is providing flexible work arrangements, which allow staff to enjoy flexible schedules or work from different locations. This can help alleviate work-related stress and improve work-life balance. Flexible work policies can have a significant positive impact on employee mental health, contributing to lower stress levels and greater job satisfaction, according to the American Psychological Association. Seventy-one percent of workers believe their employers are more concerned about their mental health since the pandemic, and 80% say that employers' mental health support is a key factor for future employment. According to a report by the Society for Human Resource Management, 57% of employers have increased their mental health benefits since the start of stay-at-home orders due to COVID-19, reflecting the rising demand for mental health support in the workplace. Organizations with strong mental health programs experience a 10% reduction in employee turnover and a 5% increase in productivity (HRSG, 2024).

Creating a supportive work environment. Building a positive workplace culture around mental health is essential, and managers and leaders should adopt an open-door policy that makes employees feel comfortable seeking help (Conforti, 2023). A study conducted by The UKG Workforce Institute recently found that 69% of employees reported that their manager has a greater impact on their mental health than doctors or therapists (Worksafe UK, 2024).

Offering training programs to raise awareness, clearly defined behavioral expectations, and transparent decision-making helps level the playing field for every individual (Cummins Facility Services, 2024).

Leaders should also encourage employees to take regular breaks, use their vacation days, and fully disconnect from work after official working hours (Garcia et al., 1997). Flexible work arrangements, such as remote working and flexible hours, can increase job satisfaction and significantly reduce employee stress.

Businesses also offer mental health awareness training programs for employees and managers, providing support for those responsible for responding to colleagues who may be experiencing mental health issues. The training may include identifying behaviors and signs of emotional distress, understanding the value of mental health, and familiarizing employees with available support resources (Neuroscience News, 2024).

6. Conclusions

Attention to mental health increased during and after COVID-19. This study highlights the significant financial losses caused by untreated mental health issues, particularly due to decreased workplace productivity, and how businesses can address this challenge through SPECT imaging. Integrating SPECT imaging into mental health treatment can provide a strong business case for employers by enhancing employees' capabilities and improving overall productivity.

Therefore, businesses must be prepared to allocate a portion of their productivity losses to enable early diagnostic procedures through SPECT imaging, either via in-house diagnostic capabilities or partnerships with specialized clinics. This approach will facilitate early diagnosis and personalized treatment for their valued employees (SNMMI, 2024).

The rise of artificial intelligence will significantly enhance the accuracy and effectiveness of diagnoses. Vast databases of SPECT scans should be processed using AI to identify potential patterns or irregularities that may not be detected by the human eye. This could provide quick and accurate diagnoses, leading to more effective treatment plans (Impression Imaging, 2024).

In short, by adopting new diagnostic technologies and artificial intelligence, both businesses and the medical community can transform mental health management, leading to better outcomes for individuals and organizations alike.

The research has some limitations. It does not focus on traditional methods used to identify mental health status but instead highlights the critical limitations of these methods. Additionally, the study could benefit from further exploration of the practical applications of innovative research methods.

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