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Research Article

Digital Burnout: The Effect of Screen Workloads on Mental Health and Quality of Life

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Abstract

Objectives: This study aimed to explore the effects of remote work on employees' physical and mental well-being, focusing on excessive screen time, prolonged work hours, and their association with symptoms of digital Burnout Syndrome.

Method: A qualitative-quantitative approach was employed, involving 70 participants working in remote or hybrid modalities. Data were collected through an online questionnaire conducted via Google Forms, where participants provided information about their screen time, work hours, sleep quality, self-perception of physical and mental fatigue, as well as their memory and concentration.

Results: The results suggest that excessive screen time and extended work hours significantly impact the ability to separate professional and personal life. Among the participants, 78% reported working an average of 9 hours daily in front of screens. This difficulty in establishing boundaries was associated with increased physical and mental fatigue, including symptoms such as muscle pain, insomnia, exhaustion, irritability, and difficulty concentrating. A multiple linear regression analysis showed that difficulty in setting boundaries was the primary predictor of fatigue. The model revealed that 29% of the variation in participants' physical fatigue levels could be explained by factors such as the difficulty in separating work from personal life ($R^2 = 0.29$; $F(2,48) = 9.72$; $p < 0.001$). Among these factors, difficulty in establishing boundaries had the greatest impact, with a coefficient of $\beta = 0.39$ ($p < 0.05$). Similarly, 31% of the variation in mental fatigue was explained by the same factors ($R^2 = 0.31$; $F(2,48) = 10.65$; $p < 0.001$), with difficulty disconnecting being the main determinant, with a coefficient of $\beta = 0.49$ ($p < 0.05$). These figures highlight how the lack of clear boundaries contributes to increased physical and mental fatigue.

Conclusion: Remote work, while offering flexibility, can lead to blurred boundaries between work and personal life, resulting in significant physical and mental strain. Addressing these challenges requires setting clear limits, promoting sleep hygiene, and fostering healthier work habits.

Keywords: *Burnout; Digital Burnout; Remote Work; Screen Time; Quality of Life*

Abbreviations

N: Total Number of Participants in the Study; n: Number of Participants in the Home Office Subgroup within the Sample; rs**:** Spearman's Correlation Coefficient; p: Statistical Significance ($p < 0.05$ for Significance, $p < 0.01$ for High Significance); R^2: Coefficient of Determination; F: F-Statistic; β: Standardized Coefficient; ICD: International Classification of Diseases; WHO: World Health Organization; SD: Standard Deviation; HO: Home Office Sample Participants; HSW: Hours of Screen Work; OS: Overtime on Screens; DEB: Difficulty in Setting Boundaries; QoS: Quality of Sleep; QSH: Quantity of Sleep Hours; CON: Concentration; MEM: Memory; PF: Physical Fatigue; MF: Mental Fatigue

Introduction

The World Health Organization (WHO) uses the International Classification of Diseases (ICD) to monitor disease incidence and prevalence in a standardized manner globally. In January 2022, the 11th revision of the ICD (ICD-11) came into effect, categorizing Burnout Syndrome under the chapter "Problems Associated with Employment and Unemployment." This change removed it from the category of mental, behavioral, and neurodevelopmental disorders where it had been previously classified under ICD-10 [1]. Despite the ICD being translated into Brazilian Portuguese between August 2021 and December 2022 by the Federal University of Minas Gerais (UFMG) with support from the Ministry of Health [2], its full implementation in Brazil is not expected until January 2027, as noted in Technical Note 61/2024. The delay is attributed to required updates in information systems and user training [3].

From this perspective, the World Health Organization [4] does not classify Burnout Syndrome as a medical condition but rather as an occupational phenomenon caused by unmanaged chronic workplace stress. Symptoms include physical and mental exhaustion, increased negativity or cynicism towards work, and reduced professional efficiency. The term "Burnout" was first introduced by Freudenberger [5], who defined it as a state of physical and mental exhaustion resulting from excessive efforts without adequate recovery time. In addition to exhaustion, Freudenberger [5] emphasized the persistent emotional pressure in workplace environments, which adversely affects mental health and individual performance. Later, Maslach and Jackson [6] expanded the concept, identifying three core dimensions of the syndrome: emotional exhaustion, mental distancing (depersonalization), and diminished professional accomplishment.

With globalization and advancements in digital technology, the boundary between personal and professional life has become increasingly blurred. The use of electronic devices for work has intensified, especially during the COVID-19 pandemic [7], which accelerated this shift by imposing remote work as a social distancing measure [8]. According to Araújo., *et al*. [9], this new remote work configuration imposed by the pandemic may have significantly contributed to the rise in Burnout cases, particularly in Brazil, where mental health was already a pressing concern. Furthermore, the psychological vulnerability of the Brazilian population—previously grappling with workplace stress and exhaustion—was exacerbated by increasing dependency on digital technologies. Consequently, the widespread use of electronic devices for work, social interaction, and leisure during the pandemic further intensified mental and emotional overload [10].

Additionally, the "society of fatigue," as described by Byung-Chul Han [11], has emerged as a reflection of chronic exhaustion experienced by individuals constantly overwhelmed by excessive stimuli and demands. Within this context, digital Burnout has arisen as a novel manifestation of Burnout Syndrome, characterized by excessive use of electronic devices, difficulty disconnecting from work, and information overload, which exacerbates individuals' physical and mental exhaustion [12].

Currently, the digital Burnout may be an emerging public health concern. Beyond the classic symptoms of Burnout, remote workers report greater difficulty in establishing boundaries between work and personal life, often leading to work hours extending beyond established schedules [13]. Indeed, data from the Digital 2023: Global Overview Report [14] show that Brazilians spend approximately nine hours daily in front of screens. This extensive screen time has been associated with mental and physical health issues, such as insomnia, fatigue, and concentration difficulties [15,16].

This syndrome not only affects public and mental health but also impacts organizational productivity and performance. For instance, in Brazil, mental health is the third leading cause of worker absenteeism [17].

The pandemic-induced increase in electronic device usage also highlighted new challenges for mental health, such as the fatigue caused by virtual meetings. According to Schoenenberg., *et al.* [18], even minor delays in online meetings can disrupt communication and generate frustration, increasing cognitive and emotional strain on workers. Combined with the difficulty of establishing clear boundaries between online and offline activities, these factors exacerbate exhaustion and contribute to digital Burnout [10].

Purpose of the Study

With the advancement of digital technologies and the growing adoption of the home office model, especially intensified during and after the pandemic, excessive screen-based work has emerged as a significant risk factor for workers' health. The lack of in-depth studies specifically addressing the impact of this work model on the increase in symptoms of Burnout Syndrome underscores the need for scientific investigations on the subject.

In this context, the present study seeks to address this gap by demonstrating, through bibliographic and field research, the possible impacts of remote work in the home environment on workers' lives and health. Furthermore, it aims to raise awareness among companies and workers about the importance of recognizing and mitigating these impacts, promoting a healthier and more balanced work environment. Thus, this study contributes to the discussion on preserving occupational health in a context of transformations in the labor market.

Materials and Methods

Design

The present study employs a qualitative-quantitative approach to investigate the impact of excessive screen work on workers' quality of life. According to Günther [19], this method aims to explore the understanding of values, perceptions, and interpretations of the collected data, providing a reliable measure of human phenomena. The study was conducted voluntarily by the researchers at the Centro Universitário Católico Salesiano Auxilium - UniSALESIANO in Araçatuba, Brazil.

Data collection procedures

The study followed Resolutions No. 466/2012 and No. 510/2016 of the Brazilian National Health Council [20,21], which regulate research involving human subjects. It was approved under approval number 6.541.931 and conducted online using an electronic questionnaire distributed through social media. Consequently, a non-probabilistic sample was chosen, employing a convenience sampling procedure [22], focusing on workers who had been actively employed in the past 12 months in home office or hybrid modalities. The online questionnaire was available from early December 2023 to late January 2024, totaling 59 days.

Although the data collection was conducted online, the dissemination targeted an inland region with limited individuals working in home office or hybrid modalities, restricting the sample to 70 participants.

Participants

The study included 70 participants aged between 20 and 73 years (M = 33.03; SD = 9.13). Among them, 30 were female (42.30%), 39 were male (54.90%), and 1 person preferred not to disclose their gender (1.40%).

Inclusion criteria were being 18 years or older; working as an employee or freelancer and having worked remotely or in person in the 12 months prior to participation. Exclusion criteria were being under 18 years of age, not having worked remotely or in person in the previous 12 months, and declining participation after reading the Free and Informed Consent Form.

Of the participants, 51 (72.86%) reported predominantly working in a home office modality (HO), while 19 (27.14%) worked in a hybrid modality, performing most activities at the workplace but with flexibility to work remotely.

Instruments

The instrument used was a structured interview designed to address issues not only indicative of Burnout Syndrome symptoms but also traits reflecting the potential of workers to develop the syndrome. Participants provided self-reported information on their screen work time, overtime hours, sleep quality and quantity, difficulty in establishing boundaries between personal and work life, persistent feelings of discouragement and/or lack of motivation to perform work tasks, emotions most prevalent during and after their home office workday, self-perception of physical and mental fatigue, memory, and concentration capacity. This information allowed for a comprehensive analysis of the factors influencing well-being in the context of remote work.

Data analysis

After data collection through Google Forms, the researchers tabulated and analyzed the data using descriptive statistics for central tendency measures, obtaining frequencies and percentages via the SPSS software (Statistical Package for the Social Sciences) — version 25.0. An exploratory data analysis was performed to assess homogeneity and normality parameters using the Shapiro-Wilk (S-W) test, which is recognized in the literature for its effectiveness [23,24]. Results revealed a non-normal distribution ($p < 0.001$) of home office modality variables, leading to the decision to apply non-parametric statistical analyses, such as Spearman's Correlation Coefficient test. Additionally, a multiple linear regression analysis was conducted to examine the combined effects of predictor variables on the outcomes of interest, providing further insights into the data relationships [25].

Results

Work situation and professional boundaries

It was observed that the average screen time among workers (N = 70) was 8.51 hours (SD = 1.59), with 75.8% reporting working 8 to 10 hours per day in front of an electronic device. Focusing exclusively on the sample of individuals working predominantly in the home office modality (n = 51), 78.4% reported working an average of 9 hours per day on screens. Figure 1 illustrates the daily screen work time for all study participants.

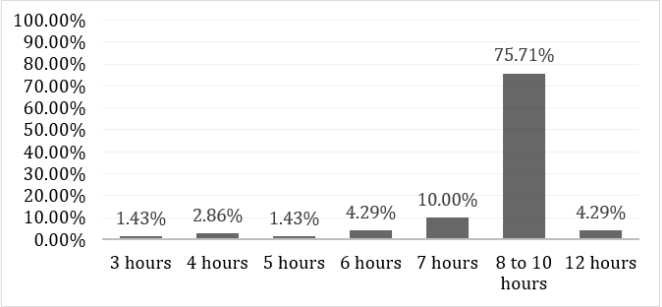

Figure 1: *Daily screen work time for the general sample (N = 70).*

Additionally, nearly half (41.18%) of those working remotely (n = 51) reported performing additional shifts of 5 hours or more on screens, indicating an increase in daily work hours compared to what was previously established or expected. Figure 2 shows the reported percentage of daily overtime hours in the home office modality.

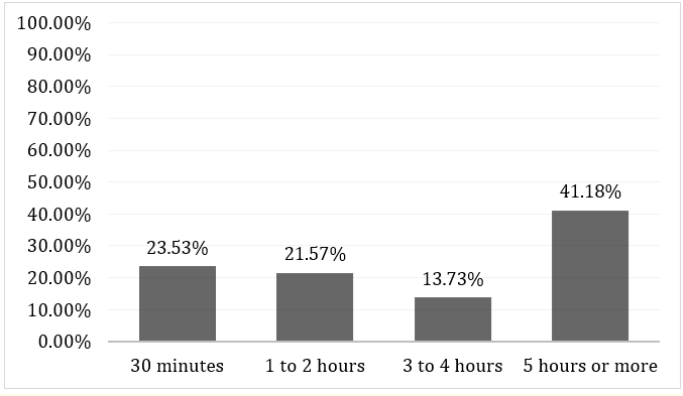

Figure 2: *Overtime work in the home office modality (n = 51).*

Work-life balance

As shown in table 1, a significant negative correlation was found between screen work hours and sleep quantity (rs = -0.33; p< 0.001). This indicates that the more time individuals in the sample spent working in front of screens, the fewer hours of sleep they reported. Additionally, a significant positive correlation was observed between screen work hours and physical fatigue (rs = 0.28; p< 0.05). This suggests that the longer participants in the home office group worked in front of electronic devices, the greater their reported sensations of physical fatigue, including muscle pain, insomnia or sleep difficulties, and headaches or migraines.

Variable		OS	DEB	QoS	QSH	CON	MEM	PF	MF
Hours of Screen Work (HSW)	rs	0.13	0.08	-0.23	-0.33**	0.09	0.09	0.28*	0.25
	p	0.37	0.56	0.11	0.02	0.52	0.52	0.05	0.08
Overtime Work on Screens (OS)	rs		0.46**	-0.21	-0.14	-0.04	-0.04	0.44**	0.36**
	p		0	0.15	0.35	0.79	0.76	0	0.01
Difficulty in Setting Boundaries (DEB)	rs			-0.38**	-0.15	-0.06	-0.11	0.48**	0.50**
	p			0.01	0.31	0.70	0.46	0	0
Sleep Quality (QoS)	rs				0.52**	0.15	0.25	-0.29*	-0.30*
	p				0	0.30	0.07	0.04	0.03
Sleep Quantity (QSH)	rs					0.07	0.28*	-0.25	-0.30*
	p					0.62	0.05	0.08	0.03

Table 1: *Correlations between screen work, difficulty establishing boundaries, sleep health, concentration, memory, and physical and mental fatigue in the home office group (n = 51).*

Note: *HSW refers to hours of screen work; OS refers to overtime on screens; DEB refers to difficulty in setting boundaries; QoS refers to quality of sleep; QSH refers to quantity of sleep hours; CON refers to concentration; MEM refers to memory; PF refers to physical fatigue; and MF refers to mental fatigue.*

**p < 0.05; *p < 0.001.*

As shown in table 1, a significant positive correlation was found between overtime work and difficulty establishing boundaries between professional and personal life (rs = 0.46; p< 0.001), physical fatigue (rs = 0.44; p< 0.001), and mental fatigue (rs = 0.36; p< 0.001) in the home office group. These findings suggest that individuals who extended their work hours beyond what was initially established or expected faced greater challenges in separating work from personal life. Additionally, participants reported symptoms of physical and mental fatigue, including feelings of low energy, self-critical evaluations of their work, lack of attention or concentration, impatience, and irritability.

Furthermore, a significant negative correlation indicated that the lack of boundaries was associated with a more negative self-perception of daily sleep quality among home office participants (rs = -0.38; p< 0.001). The lack of boundaries was also positively correlated with physical fatigue (rs = 0.48; p< 0.001) and mental fatigue (rs = 0.50; p< 0.001), suggesting that accepting additional work demands is associated with increased overload and chronic exhaustion, or Burnout Syndrome.

In the general sample (N = 70), while more than half (52.90%) reported feeling bored while performing tasks, 42 participants (60%) admitted to feeling the need to use their phones or computers to work outside scheduled hours, including on weekends. Additionally, 47.14% noted difficulty in establishing boundaries between work and personal life. Furthermore, 80% reported behavioral and habit changes due to excessive work and responsibilities, such as alterations in sleep patterns (71.43%), eating habits (58.93%), family relationships (41.07%), and socialization or leisure activities (55.36%).

To examine how overtime work and difficulty in establishing boundaries between personal and professional life affect physical and mental fatigue among remote workers, a multiple linear regression analysis was conducted. This approach allowed for identifying the significance of these variables and their extent in explaining the levels of physical and emotional fatigue reported by participants.

Physical fatigue

The analysis for physical fatigue revealed a statistically significant model, indicating that the predictor variables “overtime work” and “difficulty in establishing boundaries” contributed to explaining reported levels of physical fatigue [$F(2,48) = 9.72$; $p < 0.001$]. The model explained 29% of the variation in physical fatigue levels ($R^2 = 0.29$). This indicates that approximately 30% of the differences in physical fatigue levels among participants can be attributed to these two variables combined.

Among the variables analyzed, difficulty in establishing boundaries was the most significant factor, with a standardized coefficient of $\beta = 0.39$ ($p < 0.05$). This result suggests that workers with greater difficulty in separating work from personal life experience significantly higher levels of physical fatigue. Although overtime work also contributed to physical exhaustion, it had a smaller and nonsignificant impact in the composite model ($\beta = 0.23$; $p > 0.05$). These findings suggest that the impact of overtime work on physical fatigue is largely mediated by the lack of clear boundaries, making inadequate separation between work and personal life a major factor exacerbating physical fatigue.

Mental fatigue

For mental fatigue, the model was also statistically significant [$F(2,48) = 10.65$; $p < 0.001$], explaining 31% of the variation ($R^2 = 0.31$). This indicates that approximately one-third of the differences in mental fatigue levels reported by participants can be explained by the variables “overtime work” and “difficulty in establishing boundaries”.

In this model, difficulty in establishing boundaries again emerged as the most relevant predictor, with a standardized coefficient of $\beta = 0.49$ ($p < 0.05$). This highlights that workers unable to adequately separate professional responsibilities from personal life are more likely to experience intense mental fatigue. Conversely, overtime work showed a smaller coefficient ($\beta = 0.12$) and was not significant ($p > 0.05$),

suggesting that its direct impact on mental fatigue is limited when analyzed together with difficulty in establishing boundaries. These results indicate that the effect of overtime work on mental fatigue is mediated by the inability to disconnect, underscoring inadequate boundary setting as the primary factor contributing to emotional exhaustion.

Quality of life and sleep health

The average sleep duration among participants was 6.19 hours (SD = 0.91), as shown in figure 3, which illustrates the distribution of sleep hours in the sample. Notably, 61.43%-more than half of the individuals-reported sleeping less than seven hours per night.

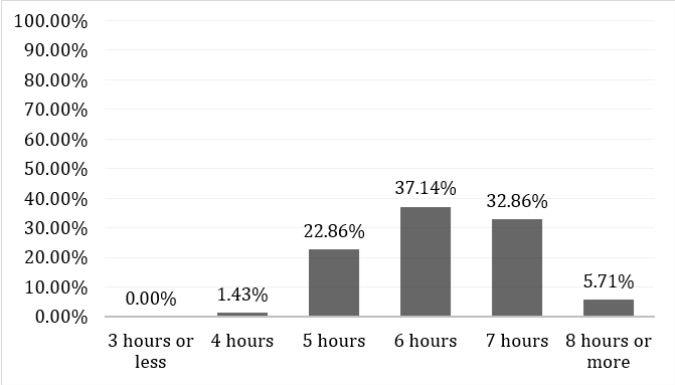

Figure 3: *Hours of sleep per night for the general sample (N = 70).*

In the home office sample (n = 51), the average number of hours slept per night was 6.19 (SD = 0.91). Table 1 highlights a significant negative correlation between sleep quality and both physical fatigue ($r_s = -0.29$; $p < 0.05$) and mental fatigue ($r_s = -0.30$; $p < 0.05$). This indicates that the lower the perceived sleep quality reported by remote workers, the higher their reported sensations of fatigue.

In addition to the correlation observed between screen time and sleep, this group also demonstrated a significant negative correlation between sleep quantity and mental fatigue ($r_s = -0.30$; $p < 0.05$). Participants reported feeling more mentally exhausted after fewer hours of sleep. These perceptions were associated with reports of low energy, impatience, helplessness, irritability, and other similar symptoms.

Furthermore, a significant positive correlation was found between the number of hours slept and participants' positive self-assessment of memory ($r_s = 0.28$; $p < 0.05$).

Regarding the primary sensations and emotions reported during home office work, such as engagement, exhaustion, excessive fatigue/lack of energy, happiness, and nervousness, the most prevalent were exhaustion (58.82%) and excessive fatigue/lack of energy (64.70%) among the home office group.

Among the most frequently reported physical fatigue symptoms were headaches and/or migraines (68.62%), muscle pain (50.98%), and insomnia or difficulty sleeping (49.01%). For mental fatigue, the most reported symptoms were feelings of low energy (76.50%), irritability (64.70%), lack of attention and/or concentration (52.94%), impatience (52.94%), and tendencies to negatively evaluate one's own work (43.13%).

Discussion

With advancements in technology, new business models, such as digital platforms, have transformed the way people work and consume products and services, significantly expanding opportunities for commercial interaction. The COVID-19 pandemic significantly accelerated the adoption of remote work in Brazil. A study conducted by the Fundação Instituto de Administração (FIA) in July 2020 revealed that 46% of Brazilian companies, spanning small, medium, and large enterprises across the country, implemented home office practices. Initially, more than half of their employees encountered challenges in adapting to telework [26].

Simultaneously, the literature indicates that excessive use of digital devices can negatively impact users' mental health, contributing to increased levels of stress, depression, and anxiety [15,16,27,28]. Moreover, a previous study, such as the cross-sectional study by Abdulrahman., *et al*. [29], conducted with a sample of 315 medical students and physicians living in Saudi Arabia, highlighted the relationship between digital technology dependence and increased symptoms of emotional exhaustion. The study also indicated that communication among colleagues and patients was significantly impacted by technological overload, leading to reduced efficiency and interaction quality. Similarly, the findings of this study suggest that the difficulty in establishing boundaries between work and personal life, combined with prolonged use of devices in home office settings, may be associated with increased symptoms of physical and mental fatigue.

While the results of the present analyses do not establish a direct cause-and-effect relationship between screen work time, overtime, and individual well-being, significant associations were identified that provide insights into these phenomena. Participants in the home office sample (HO) exhibited higher levels of physical fatigue as they faced difficulties in setting boundaries between professional and personal life and worked extended hours.

The multiple linear regression analysis revealed that the variables "overtime" and "difficulty in establishing boundaries" explained 29% of the variation in physical fatigue levels [$R^2 = 0.29$; $F(2,48) = 9.72$; $p < 0.001$]. Among these variables, difficulty in establishing boundaries emerged as the most significant predictor of physical fatigue, with a standardized coefficient of $\boldsymbol{\beta} = 0.39$ ($p < 0.05$). Conversely, the direct impact of overtime was smaller and not significant in the composite model ($\boldsymbol{\beta} = 0.23$; $p > 0.05$), suggesting that the effects of extended hours are largely mediated by the inability to disconnect from work.

These findings indicate that, although working long hours may contribute to physical fatigue, the inability to adequately separate work from personal life is a central factor intensifying this exhaustion. Symptoms reported by participants, such as muscle pain, insomnia, sleep difficulties, and headaches or migraines, align with conditions described by Lima and Fernandes [30], including back pain, muscle stiffness, headaches, and other physical issues related to overwork.

Such symptoms may be indicative of Burnout Syndrome. According to Pruessner, Hellhammer, and Kirschbaum [31], this condition can lead to a wide range of physical and psychological manifestations, including unexplained generalized pain, extreme fatigue, reduced concentration, feelings of apathy and purposelessness, and disengagement from work. These symptoms are typically associated with factors such as role ambiguity, responsibility conflicts, high-stress events, excessive workload, and constant workplace pressure. Lima and Fernandes [30] emphasize that these symptoms can occur independently or in combination, without following a uniform pattern among individuals.

Behavioral responses to Burnout Syndrome may stem from reactions to physical symptoms, as behaviors like irritability, aggressiveness, and impatience are frequently linked to physiological complaints such as headaches and migraines [30]. Regarding the types of fatigue experienced, even though a low positive correlation was observed between physical fatigue and screen work hours ($r_s = 0.28$; $p < 0.05$), it

is worth discussing that some individuals may experience sensations and behaviors related to or as a consequence of mental exhaustion. For instance, lack of energy, impatience, helplessness, and irritability, as reported by participants, may reflect associations between screen work hours and perceived physical fatigue.

Although the Brazilian Federal Constitution establishes that the regular workweek should not exceed 44 hours [32], Article 59 of the Consolidation of Labor Laws permits up to two additional hours per day, totaling a maximum of 10 overtime hours per week, under agreement [33]. However, over 40% of home office workers in this study reported daily overtime shifts of five or more hours. In this group, a significant positive correlation was observed between overtime and increased reports of physical fatigue ($r_s = 0.44$; $p < 0.001$) and mental fatigue ($r_s = 0.36$; $p < 0.001$) among individuals working prolonged shifts. Such issues may be related to the consequences described by Santos [16], which indicate that excessive screen use triggers higher levels of stress in adults and more severe psychological problems in the elderly.

The significant positive association between overtime and difficulty in setting boundaries between professional and personal life ($r_s = 0.46$; $p < 0.001$) may suggest that remote work has facilitated and expanded the scope of work beyond traditional office settings. This has allowed individuals to work more hours than initially defined, including weekends, as also noted by Tietze [34] and Barros and Silva [35]. Additionally, the absence of clear boundaries appears to be an indicator of more negative self-perceptions of daily sleep quality in the home office group ($r_s = -0.38$; $p < 0.001$). Participants reported that extended screen time may be one of the factors linked to increased reports of physical and mental fatigue and difficulty separating work from personal life, corroborating literature that associates long work hours with Burnout Syndrome [36,37].

Potiguara Filho., *et al.* [37] argue that while remote work may be perceived as more flexible, enabling individuals to choose where they work, most tasks are often performed at home. This can blur the boundaries between work and leisure, leading workers to respond to messages outside working hours and feel constantly productive. Delgado [38] emphasizes the importance of recognizing workers as human beings entitled to a dignified existence, which includes family time, leisure, and rest. Thus, establishing boundaries between work and personal life is a legal requirement aimed at preserving individual health and well-being.

Regarding the hours of sleep for this same sample ($N = 51$), the results concerning the negative and significant correlation between sleep quality and physical fatigue ($r_s = -0.29$; $p < 0.05$) and mental fatigue ($r_s = -0.30$; $p < 0.05$) are consistent with the findings of the Instituto do Sono [39] on the importance of sleep hygiene. While no causal relationship was established, the data indicate that the lower the perceived quality of sleep among remote workers in this group, the higher their reported levels of fatigue. Sleep hygiene involves a set of practices aimed at preparing the body for rest and promoting better sleep quality. These practices include avoiding the use of electronic devices in bed for at least an hour before sleeping and reserving the bed exclusively for sleep, avoiding activities such as work or studying.

Furthermore, while adults aged 18 to 60 need at least seven hours of quality sleep per night on a regular schedule [40,41], the participants in the home office group averaged only 6.19 hours of sleep per night. A significant negative correlation was observed between sleep duration and mental fatigue ($r_s = -0.30$; $p < 0.05$), showing that individuals sleeping less than recommended not only felt more mentally fatigued but also described symptoms such as a lack of energy, impatience, powerlessness, and irritability after short sleep durations. These findings suggest a likely relationship between screen use, sleep quantity and quality, and fatigue.

Regarding the main sensations and emotions reported by the home office group related to physical and mental fatigue, the most common were exhaustion, excessive fatigue/lack of energy, headaches and/or migraines, muscle pain, insomnia or difficulty sleeping, irritability, lack of attention and/or concentration, impatience, and a tendency to negatively evaluate their own work. These descriptions align with the literature on symptoms of Burnout Syndrome and the emerging "digital Burnout" [12,30,42].

For the overall sample of workers in this study (N = 71), it was observed that 75.71%-a little over three-quarters—spend approximately 9 hours a day in front of screens. This time refers specifically to work-related screen usage, excluding activities such as social media, gaming, or streaming. Similarly, data from the Digital 2023: Global Overview Report by DataReportal, conducted across 45 countries, show that Brazilians spend an average of 16 waking hours per day, more than half (56.6%) of which is dedicated to using smartphones and computers, making Brazil the second country with the highest screen exposure time [14].

Christensen., *et al.* [43] found that excessive screen use during the day was associated with shorter sleep durations, and exposure to smartphones at bedtime was linked to poorer sleep quality. Similarly, in this study, the general sample averaged 6.19 hours of sleep per night, with more than half (61.43%) reporting sleeping less than the recommended 7 hours per night. This could pose a significant risk to the quality of life of these individuals. In addition to the cognitive and emotional deficits caused by excessive screen use, such as increased symptoms of attention deficit, emotional and social impairments, and social isolation [44], inadequate sleep also contributes to health risks such as cardiovascular diseases, cognitive decline, depression, high blood pressure, elevated cholesterol, and obesity [45].

A longitudinal cohort study, Whitehall II, which followed 7,800 healthy public servants in the United Kingdom over 25 years, investigated how work environment, lifestyle, and social factors influence long-term health. The study found that individuals sleeping five hours or less per night at age 50 had a 30% higher risk of developing multiple chronic diseases, such as diabetes, cancer, stroke, heart failure, chronic obstructive pulmonary disease, depression, and dementia, compared to those sleeping seven hours. This risk increased to 32% at age 60 and 40% at age 70 [46].

Difficulty sleeping may be linked to melatonin production, the hormone responsible for inducing sleep, which is released at nightfall in response to low light exposure. However, excessive screen use at night suppresses this hormone, impairing not only rest but also its anti-inflammatory, immune, and antitumor functions [47]. To maintain a healthy circadian rhythm, it is essential to reduce screen use during nighttime hours [39].

Additionally, nearly half (47.14%) of workers in this study reported experiencing excessive work demands. In terms of behavioral and habit changes, 80% of the general sample reported noticing changes due to excessive work and responsibility, such as altered sleep patterns (71.43%), diet (58.93%), family relationships (41.07%), and socialization or leisure activities (55.36%). Moreover, more than half (52.90%) expressed boredom with their work tasks, while 60% felt the need to access their phones or computers outside of regular working hours, including weekends. These behaviors may reflect exhaustion from work overload and the difficulty of establishing boundaries between personal and professional life, potentially contributing to the development of Burnout Syndrome [12,48].

Lastly, the delay in implementing the 11th revision of the International Classification of Diseases (ICD-11) in Brazil for over three years has significantly impacted health promotion by hindering the diagnosis and treatment of various conditions, such as Burnout Syndrome. The new revision includes more precise and updated definitions for categories, codes, and diagnostic criteria. This delay and the continued use of ICD-10 until 2025 do not reflect the latest scientific findings [49], limiting the development of awareness policies and the implementation of well-being measures for workers with symptoms of Burnout.

The findings of this study highlight the importance of understanding and mitigating the effects of chronic exhaustion, particularly in remote workers, given the correlations between excessive screen time, physical and mental fatigue, work overload, and disconnection difficulties, which pose risks for developing chronic illnesses [16,44].

Thus, new studies are essential to develop public health interventions aimed at primary prevention, such as sleep hygiene practices and limiting electronic device use outside work hours. Policies promoting digital disconnection after work and clear boundaries between personal and professional life are fundamental to reducing the risk of Burnout and improving workers' overall health.

An international study indicated that mental health education programs and self-care strategies are effective in preventing Burnout and its physical and emotional consequences [12]. Additionally, a systematic review by Costin, Roman, and Balica [50] emphasized that effective workload management, combined with strong organizational support, plays a crucial role in mitigating Burnout's impacts, fostering sustainable well-being in professional environments.

These findings underscore the importance of designing and implementing targeted interventions for remote and hybrid work contexts, where excessive screen time and disconnection difficulties are growing risk factors. These interventions should encourage establishing clear boundaries between professional and personal life, such as adopting fixed work hours, organizational policies promoting digital disconnection outside of work hours, and limiting overtime.

Although causality could not be directly established, the results show that difficulty setting boundaries and long work hours significantly contribute to increased physical fatigue and its impacts on workers' well-being. These conditions are associated with symptoms such as muscle pain, insomnia, headaches, and other signs of physical and emotional exhaustion, which, if not addressed, may lead to Burnout. Beyond preventing Burnout, these strategies aim to create an organizational culture prioritizing workers' holistic health, improving quality of life and workplace satisfaction, increasing productivity, and ensuring the sustainability of organizations.

Conclusion

This study revealed the impact of remote work on physical and mental well-being, highlighting associations between excessive screen time, overtime work, and fatigue symptoms such as muscle pain, insomnia, and migraines. The difficulty in separating professional and personal life was identified as a key factor contributing to increased physical and mental fatigue. Furthermore, reduced sleep quality and quantity were found to be linked to higher levels of mental and physical exhaustion.

To address these challenges and mitigate risks associated with remote work, the following recommendations are proposed:

1. Establish clear work-life boundaries to reduce the difficulty in disconnecting from work and prevent chronic fatigue.
2. Promote sleep hygiene practices, such as limiting screen use before bed, to improve sleep quality and health.
3. Implement regulations to limit work hours, ensuring control over labor demands and preventing overwork.
4. Develop organizational well-being policies that include flexible schedules, digital disconnection initiatives, and mental health support.

These measures are critical for fostering a healthier and more sustainable remote work environment, improving both the well-being and productivity of workers.

Conflict of Interest

None of the authors have any conflict of interest.

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