RESEARCH ARTICLE

Assessment of work-related stress and burnout among clinical research occupations [version 1; peer review: awaiting peer review]

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Abstract

Background: Burnout syndrome is included by the World Health Organization (WHO) in the International Classification of Diseases, and it has a direct impact on the health of workers and also on the performance of companies. In this work, we propose a comprehensive methodology for evaluating work stress and burnout in various occupations within a healthcare organization.
Methods: The work stress questionnaire and the Maslach Burnout Inventory were administered to employees of 7 different occupations within a company. The effect of the stressors is established using Cohen's d test, as well as the relationship between the main stressors, burnout and occupation.
Results: The results of the study indicated that medical service personnel had the highest levels of stress and burnout syndrome, but significant stress levels and burnout scores were also identified among finance, clinical operations, and marketing professionals.
Conclusions: Stress and burnout can vary by department, team, or individual in a company. Based on the study, it was concluded that a single approach to assessing stress and burnout may not provide a complete understanding, in fact, a better alternative is to assess each occupation specifically.

Keywords

stress, occupations, emotional exhaustion, depersonalization, personal fulfillment

Open Peer Review

Approval Status *AWAITING PEER REVIEW*

Any reports and responses or comments on the article can be found at the end of the article.

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Introduction

Work stress is a common issue faced by many employees, and is caused by several factors, including continuous overwork (Panigrahi, 2016), unclear job responsibilities (Kim and Hye-Sun, 2022), and difficulty in adapting to the behaviors of customers, co-workers, or any present health issues (Salama et al., 2022). This stress can result in chronic anxiety, psychosomatic illnesses, and various emotional problems (Gray and Muramatsu, 2011; Selmanovic et al., 2011). Chronic stress can be particularly detrimental to health and well-being, leading to long-term physical and mental health problems. When employees face continuous stress and lack strategies to manage it, they can suffer burnout, a condition characterized by physical, emotional and mental exhaustion (Selmanovic et al., 2011).

Occupations with direct patient or client interaction experience high levels of burnout and stress, including intensive care units, oncology, emergency services, and operating rooms in the medical sector (Lloyd et al., 2002; Piko, 2006; Menéndez & Papasidero, 2019; Chirico et al., 2021; Corona et al., 2022). Burnout syndromes are frequently reported in these high-stress environments (West et al., 2009). Neglecting these issues can have negative consequences, not only for individuals but also for company productivity (Selmanovic et al., 2011; Corona et al., 2022).

The consequences of ignoring these levels of stress and burnout in a company can be serious. Individuals can suffer from chronic anxiety, psychosomatic illness and emotional problems. This, in turn, can lead to decreased job performance and increased risk of turnover (Selmanovic et al., 2011; Corona et al., 2022). For organizations, the consequences can include decreased productivity, increased healthcare costs and a negative impact on the company's reputation. To mitigate these risks, it is important for organizations to periodically assess the stress and burnout levels of their employees and implement strategies to support their well-being.

This paper presents a comprehensive methodology for evaluating work stress and burnout syndrome among the various occupations within an organization dedicated to providing care to people's health as well as the development of clinical research. The objective of this study is to gain a deeper understanding of the extent and nature of work-related stress and burnout among employees of an organization dedicated to the health care of people, as well as to the development of clinical research. The methodology proposed in this article includes the use of standardized tools, such as surveys and interviews, to gather data from employees across different occupations within the company.

Methods

The study had an exploratory and descriptive scope and involved two cross-sectional surveys conducted at different time points to minimize the potential for any biases or confounding variables that may have arisen if the surveys were conducted simultaneously. The study was conducted using the same set of questions for all participants. This helped to reduce bias, and also made it easy to compare the responses across participants. The participants were assured that their responses would be kept confidential, which was done by providing anonymous surveys or by keeping their personal information confidential. Moreover, all the employees in the company were selected for this study, which helped to reduce bias by ensuring that all members had an equal chance of being selected.

The study recruited a total of 79 participants from an organization dedicated to providing care to people's health located in Jalisco, Mexico. All company employees were invited to participate and the sample included people from various departments and positions, ensuring complete coverage. The company provides services related to clinical research, medical testing, and general and specialized consultations, among others.; This company was selected because the CEO planned to create an internal wellness plan within the company. Participants were informed about the study and its purpose, which was to improve the overall well-being and work environment within the company. This transparency helped to build trust and encourage participation. The data collection was paper-based and took place in the month of February 2022 in two different weeks. Sociodemographic background information was collected: sex, age, marital status, number of children and occupation of each participant.

The first survey used was the Job Stress Survey (Spielberger et al., 2010). It consists of three scales: 1) Job Stress Severity Scale (JS-S) which indicates the average severity score perceived by the individual in 30 stressful situations (ranges from question 2 to 30, question 1 is the standard stressor); 2) Job Stress Frequency Scale (JS-F) which indicates the average frequency with which the 30 stressful situations have occurred in the last 6 months (from question 31 to 60) and 3) Job Stress Index (JS- X) where an overall level of stress is considered. The job stress index is obtained as a result of multiplication between the result of JS-S and JS-F and results between 0 and 81 are obtained (Puteri & Syaebani, 2018); for this case the overall effect size of JS-F index is considered. The effect size was determined using Hedges' g-test or Cohen's d-test, according to the nature of the data (Faraone, 2008). The effect was considered small if it was between the values of 0 to 0.49, medium between 0.5 and 0.79, and large between 0.8 and higher (Arnoldo & Víctor, 2015; Faraone, 2008). Cronbach's α coefficients were 0.97, 0.94, and 0.97 for JS-S, JF-S, and JS-X, respectively.

The second survey used was the Maslach Burnout Inventory (Maslach et al., 1996). It was used to determine burnout syndrome, being the most used and best validated for the assessment of burnout (West et al., 2009). It consists of 22 items divided into 3 dimensions: 1) emotional exhaustion (EE), with 9 items, the overall score being low if it presents a value from 0 to 18; moderate from 19 to 26 and high > 27; 2) depersonalization (DP), with 5 items, being low from 0 to 5, moderate from 6 to 9 and high > 10; 3) and difficulty in personal accomplishment (PA), with 8 items, being low from 0 to 33 (high level of burnout), moderate from 34 to 39 (medium level of burnout) and high > 40 (low level of burnout) (González & De la Gándara, 2004; Liebenberg et al., 2018; Menéndez & Papasidero, 2019). The items are rated on a 7-point Likert-type scale ranging from 0 (never) to 6 (every day). For the analysis, binary correlations were performed for the scales and the global burnout score, considering all occupations; subsequently, bar graphs were used to observe the occupations where the burnout response and the scales associated with the syndrome predominate (Rumschlag, 2017). Cronbach's α coefficients were 0.90, 0.60 and 0.81 for EE, DP and PA, respectively. The study by Lee et al. (2019), also showed a lower α value for PA (0.49), so they suggest excluding 3 items from the PA scale to obtain a higher score (0.85), however, when excluding the items, for this sublevel no values higher than 0.67 were reached, so it was decided to continue with the information obtained.

Statistical analysis

Sociodemographic aspects were expressed as frequencies and percentages. Age was recorded considering intervals of < 30 years; 30 to 39 years; 40 to 49 years; 50 to 59 years; and 60 to 80 years (age intervals of the National Vaccination Plan in Mexico). For both types of surveys, normality was assessed using the Shapiro-Wilk test and equality of variances using the Levene test. Sample comparisons were performed using the Mann-Whitney U test for nonparametric data or the t test for parametric data. In comparisons where the sample size was greater than 20, Cohen's d was used, and when the sample size was less than 20, Hedges' h was used. In the present study, only stressors with medium to large effects and a significance level ≤0.05% were considered.

Statistical analysis was performed with the IBM SPSS statistical package (version 26, IBM Corporation, Armonk, NY, USA).

Ethical approval

The study was conducted in accordance with the General Law for the Protection of Personal Data. Ethical approval was granted by the Research Ethics Committee of Investigación Biomédica para el Desarrollo de Fármacos, S.A. de C.V. (Folio number: CEI:000001) on December 8 of 2022. The surveys are carried out continuously in the company as part of an internal programme, and ethical approval was sought retrospectively when the authors decided to publish the results. After a complete description of the study to the participants, written informed consent was obtained. The confidentiality of the participants was guaranteed.

Results and discussion

Sociodemographic aspects

The organization consists of healthcare professionals such as nurses, lab technicians, receptionists, managers, and general practitioners, in addition to personnel who support the development of clinical research, marketing, among others. In the present study, 80 people were contacted to participate, of which 79 participated and completed both surveys. Table 1 describes the number of employees by occupation, all employees who participated in the study and those who participated in both surveys (Flores Luna et al., 2023).

Table 1. Sociodemographic aspects.

Demographics	Classification	n	%
Sex	Women	53	67
	Men	26	33
Age	<30 years	33	41.8
	30-39 years	24	30.4
	40-49 years	16	20.3
	50-59 years	5	6.3
	≥60 years	1	1.3

Table 1. *Continued*

Demographics	Classification	n	%
Civil status	Single	47	59.49
	Married	32	40.51
Children	Yes	35	44.30
	No	44	55.70
Occupations	Clinical operations	22	28
	Administrative	13	16
	Medical services	11	14
	Commercial	7	9
	Finance	6	8
	Marketing	4	5
	Other areas	16	20

During the coronavirus disease 2019 (COVID-19) pandemic, personnel working in this area had variable schedules due to the high demand for COVID tests. The administrative area includes managers, assistants and receptionists who manage the company's objectives, paperwork and the logistics of company events. Clinical operations, on the other hand, focus on managing the execution of clinical research projects for the pharmaceutical industry and are composed of nurses, clinical research coordinators, pharmacists, specialists, and general managers.

The sample included 53 women and 26 men, so the sample was mainly represented by women, which may establish a bias in the results. In terms of age, most respondents were under 30 years of age, single, childless, and the most represented occupation corresponded to clinical operations (28%); in this occupation, the main activities were focused on conducting clinical studies sponsored by the pharmaceutical industry, followed by administration and medical services (Table 1), all persons participating in the study. Note that the number of people per occupation is not the same, which may represent a bias in the results.

Work stress

Job Stress Severity (JS-S)

When evaluating the effect of stress severity among all occupations, it was possible to establish that of the 30 stressful situations, 5 showed significant results (Table 2). These are the main causes of stress common to all occupations recorded. According to Santos et al. (2011), the predominant items are part of the subscales of work pressure (4th), lack of support (10th, 17th) and lack of organization (30th).

Table 2. Work stress results for the JS-S scale.

Item	S	M	S.D.	Sig.	d	Effect	Stressful situation
4a	F	4.26	2.14	0.02	0.56	Medium	I am assigned new tasks very often
	M	3.04	2.11				
10a	F	3.04	2.17	0.01	0.61	Medium	The quality of the equipment is poor and inadequate
	M	4.58	2.91				
14a	F	2.34	1.91	0.02	0.55	Medium	I experience negative attitudes towards the institution
	M	3.54	2.47				
17a	F	2.93	2.63	0.03	0.52	Medium	Personal insults between colleagues
	M	4.35	2.87				
30a	F	3.40	2.34	0.03	0.51	Medium	Conflicts with other departments
	M	4.73	2.95				

N=53 women y 26 men. Abbreviations: S: Sex; M: male; F: female; M: Mean; S.D.: Standard Deviation; Sig: significance; d: Cohen's d.

Table 3. Job stress results for the JF-S scale.

Item	S	M	S.D.	Sig.	d	Effect	Stressful situation
19b	F	2.76	3.3	0.05	0.48	Medium	insufficient salary
	M	4.42	3.6				

N= 53 women y 26 men. Abbreviations: S: Sex; M: male; F: female; M: Mean; S.D.: Standard Deviation; Sig: significance; d: Cohen's d.

Although the overall severity effect was medium, we continued with the particular evaluation of the JS-S scale in each of the occupations, finding significant results with large effects, mainly in the occupations of medical services with 10 stressful situations (items 1, 2, 3, 6, 11, 13, 17, 21, 27 and 30) and administration with 7 (2, 5, 7, 16, 20, 26, 29). For both occupations, most of the items are associated with the subscale lack of organization, in addition to intense work pressure, predominating in administration (Santos et al., 2011). Both occupations had in common the stressful situation of performing work in free time. On the other hand, clinical operations, financial and commercial presented large effects with 2 (item 4 and 10), 1 (item 10) and 1 (item 11) stressful situations, respectively (data not shown).

Frequency of occupational stress (JS-F). The survey revealed that the most frequent stressful situation is related to insufficient salary, although the effect was medium (Table 3). When analyzing the occupation of medical services and administration, it was observed that the items with large effect that were most frequently reported were 2b (I have to do work in my free time), 16b (In critical situations, decisions are made without careful analysis), 20b (Poorly motivated peers), 26b (Excessive compliance goals) and 29b (Poorly motivated peers). The most predominant items were associated with the lack of organization subscale (Santos et al., 2011).

Work Stress Index (JS-X). The results of the general work stress index (JS-X) indicate a moderate level of stress across all occupations, with a Cohen's d of 0.46 and Hedges' g of 0.47.

In the stress survey, the reliability values of Cronbach's α coefficients were above 0.85 (JS-S: 0.97, JS-F 0.94 and JS-X: 0.97), so they can be rated as very satisfactory; thus, the results are compatible with the theoretical frame of reference (Holmström et al., 2008).

Burnout syndrome

The global average burnout shows a low trend of exhaustion (DP: 4.3; PA: 42.8; EE: 18.5), however, the global results of the emotional exhaustion scale (EE: 18.5) provided evidence of an onset of a moderate burnout syndrome among all the occupations evaluated. When performing the correlation analysis, the EE scale presented a strong positive correlation with the general result of burnout, regardless of the type of occupation (Table 4). For the PA scale, despite not being significant, a negative relationship was found with respect to burnout ($r = -0.034$, $p = 0.768$), which is consistent with other studies where it is established that this response is strongly determined by organizational processes and structures (Piko, 2006).

Similarly, it is observed in the scatter diagrams, where the high positive correlation between the EE scale and burnout is evident, and in the case of the DP scale, despite presenting a low R^2 value (0.608), it can also indicate its influence in the burnout response (Figure 1).

Table 4. Correlations by scales and burnout.

		EE	PA	DP	Burnout
EE	Pearson's Correlation	1	-0.339**	0.641**	0.920**
PA	Pearson's Correlation	-.339**	1	-0.241*	-0.034
DP	Pearson's Correlation	0.641**	-0.241*	1	0.780**
Burnout	Pearson's Correlation	0.920**	-0.034	0.780**	1

EE: emotional exhaustion; PA: difficulty for personal fulfillment; DP: depersonalization.
*p < 0.05 (2 tales).
**p < 0.01 (2 tales).

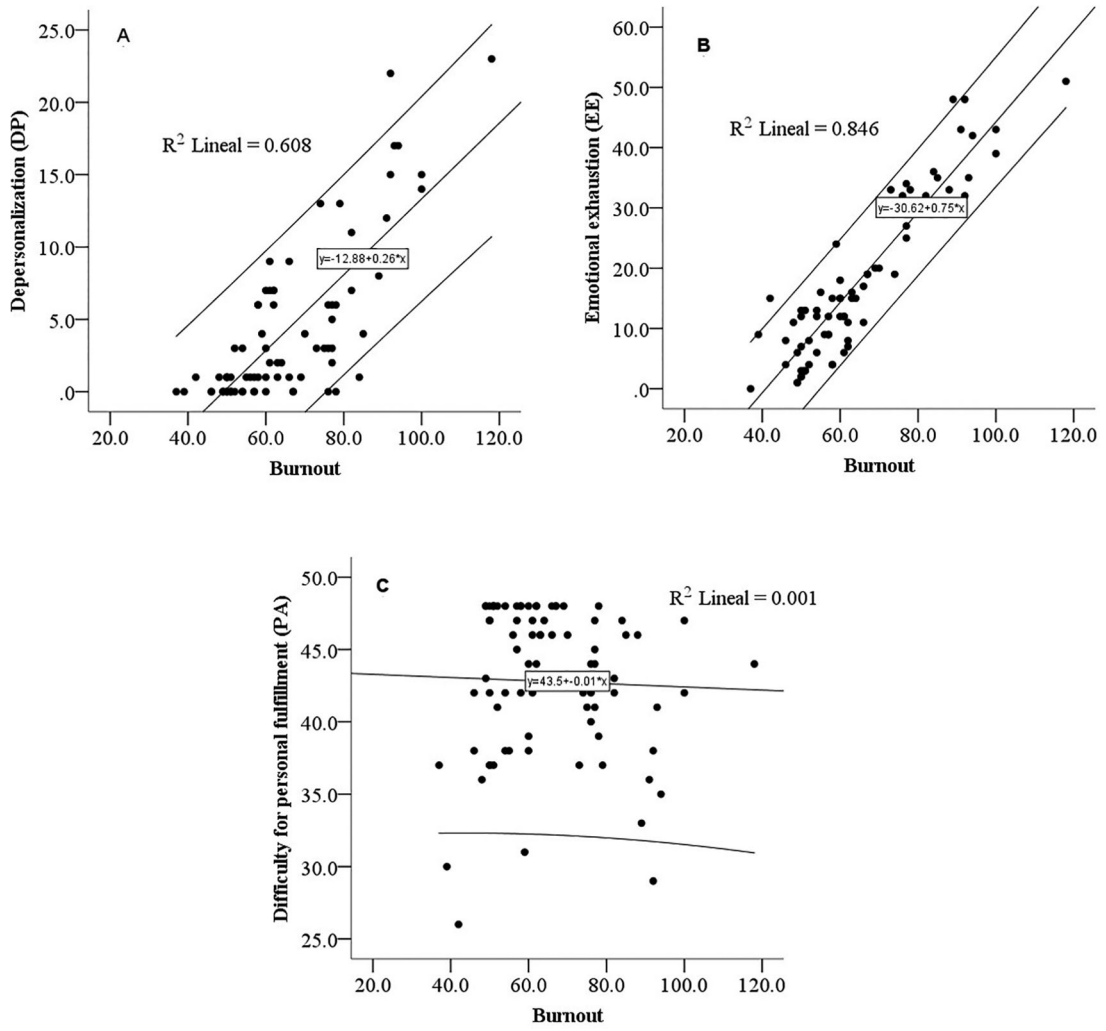

Figure 1. Data scatter diagrams for each of the scales (DP, EE and PA) as a function of the overall Burnout response. Abbreviation: A: PD – Burnout ratio; B: EE-Burnout relationship and C: PA-Burnout relationship. R^2: coefficient of determination. The 2 confidence bands simultaneously at 95%.

In Figure 2 we show the relationship between the scales (EE, PA and DP) and the occupations, confirming that the medical services personnel present a response of exhaustion associated with only two (EE and DP) of the 3 scales (Figure 2). West et al. (2009), mention that high values of depersonalization (DP) and emotional exhaustion (EE) and low values of personal accomplishment (PA) indicate exhaustion; however, in the present study, the PA scale for medical services did not show a high value of burnout.

In addition, people working in the marketing area presented a high level of burnout associated with the PA scale; it should be noted that the PA score is inversely proportional to the degree of burnout, i.e., the lower the performance or personal accomplishment score, the more affected the person is (González and De la Gándara, 2004). Job satisfaction has an important influence on work-related behaviors such as absenteeism, job performance and turnover intention (Piko, 2006). Other areas that registered moderate burnout scores were finance and clinical operations.

Shbeer and Ageel (2022) mention that the main cause of emotional exhaustion (EE) among medical services personnel is related to the nature of their tasks; in this sense, it states that workload, insufficient rewards in the workplace and unfair treatment with employees are the causes associated with EE. Chatterjee et al. (2021); mention in their study on stress in medical service personnel, that physicians tend to present high levels of anxiety due to stress, unlike nurses who develop more irritability; in general, they state that work overload leads to irritability. Piko (2006), suggests that an additional indicator to the burnout and stress survey may be the assessment of psychosomatic symptoms, which have been related to work stress and burnout.

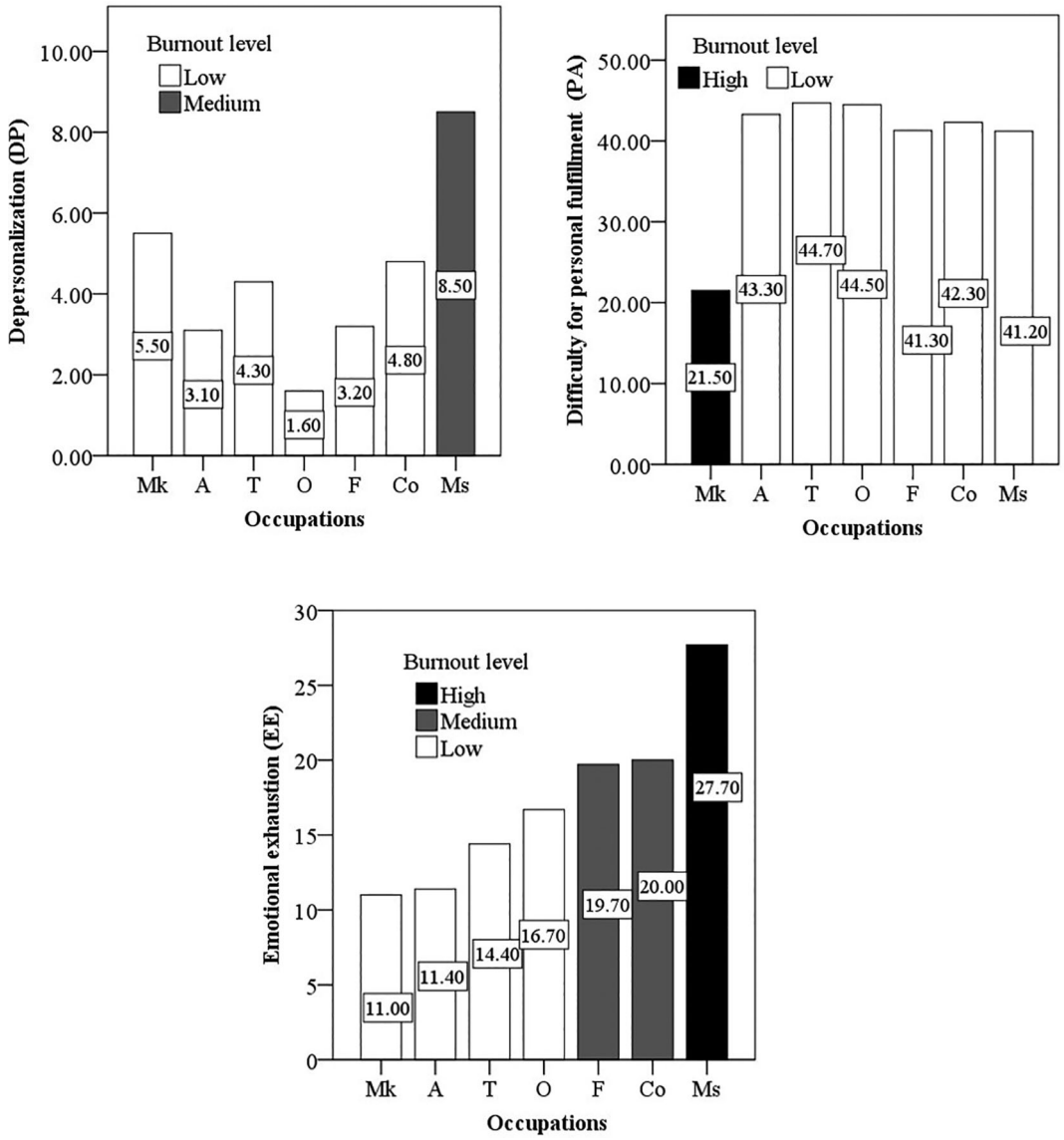

Figure 2. Bar graphs relating each of the scales (EE, PA and DP) to the level of burnout among all occupations. Abbreviations: Mk: Marketing; A: Administration; T: Trade; F: Finance; Co: Clinical Operations; Ms: Medical Services; O: Others.

The lack of evaluation of work stress or the presence of burnout and not having preventive programs can have repercussions on physical, emotional and psychological integrity (Corona et al., 2022) in addition to impacting work efficiency and reducing productivity in the company (Selmanovic et al., 2011).

Prevention activities to reduce stress and the incidence of burnout for workers not only in the medical services sector (Yadav & Sahu, 2022), but also for those who show signs of chronic stress or moderate burnout, contribute to the reorientation of organizational approaches; these activities include modifications of schedules, work processes, and generation of individual-centered strategies (Liebenberg et al., 2018). Shbeer and Ageel (2022) suggest taking breaks, physical activity and medical services promotion programs, to reduce burnout.

The results of this study allowed the managers of the company where the participants work to support the development of a psychosocial factors prevention plan referred to in the Mexican Official Standard NOM-035-STPS-2018; it included a detailed study of the medical services shift schedules, the creation of integration activities such as: monthly birthday celebrations, active breaks once a week and the teamwork model with dynamics focused on the needs of the community.

The company also organizes talks to raise awareness about people with disabilities and against violence. In addition, the quality management system was established, which harmonized the company's processes and procedures and promoted the development of job descriptions for personnel. These findings highlight the importance of evaluating and implementing customized strategies to overcome stress and burnout syndrome in specific functional areas within organizations. Such an approach can help to localize the main areas where employees are most affected and to tailor interventions that address the unique challenges faced by employees in different roles (Kim & Hye-Sun, 2022; Panigrahi, 2016; Salama et al., 2022).

Conclusions

Burnout is a state of emotional, physical and mental exhaustion resulting from prolonged stress and exposure to difficult working conditions. The main occupation in which burnout was recorded was in medical services, which is continually noted as the sector most affected by burnout syndrome. In this sense, people working in these fields are likely to experience high levels of mental, emotional and physical stress, which can have a significant impact on their overall well-being.

Other occupations that also recorded burnout according to the scale were finance, clinical operations and marketing. In finance, employees may suffer burnout due to the high pressure they are under to meet performance targets and the fast-paced and changing nature of the financial markets. In clinical operations, employees working in the healthcare sector can suffer burnout due to the demanding nature of their work, which involves treating and caring for patients in often stressful and time-pressured environments. Marketing professionals can suffer burnout due to the constant need to be creative, generate new ideas and meet performance targets. Pressure to meet the high expectations of customers and stakeholders, as well as the fast pace and constantly evolving nature of the marketing industry, can also contribute to burnout in this field.

Stress and burnout can manifest differently in different departments, teams, or individuals within a company, depending on factors such as job role, responsibilities, workload, and working conditions. Global assessments that do not take these differences into account may not accurately reflect the true level of stress and burnout in different parts of the company. To overcome this limitation, the companies must carry out partial evaluations that are tailored to specific areas within the company. These evaluations can provide more accurate insights into the specific stressors and burnout risks in different parts of the organization, allowing companies to take targeted and effective action to address them.

Data availability

Figshare: Assessment of work-related stress and burnout among clinical research occupations. https://doi.org.10.6084/m9.figshare.22631374.v1 (Flores Luna et al., 2023).

This project contains the following underlying data:

- Burnout syndrome.xlsx - Burnout syndrome (1).csv
- Job Stress Survey.xlsx - Job Stress Survey (1).csv

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