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Exploratory Study on the Effect of Working Conditions of Portuguese Health Professionals on Burnout and Substance Abuse

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Abstract: This study explores the perceptions of a sample of Portuguese healthcare professionals' about working conditions, their impact on behaviour, and mental health. The intention is to increase the knowledge about the effect of these conditions on substance abuse and burnout. The sample includes 91 professionals, averaging 39 years of age, with 72.4% females, 17.6% physicians, and 82.4% nurses. The MBI, SDS, and WCAS were used as measurement instruments. Just 20.9% view their conditions positively, while 38.5% find them unfavourable, emphasising precariousness, physical environment, and material inadequacy in healthcare institutions. Notably, public sector conditions are worse than in the private sector. The study reveals a significant impact of these conditions on burnout symptoms and substance consumption among professionals. Over 80% experience high emotional exhaustion, and nearly 60% display elevated depersonalisation. Furthermore, comparative analyses of these variables were conducted based on socio-demographic and professional variables. The study links adverse working conditions to substance consumption as a maladaptive coping strategy. Professionals facing burnout are more likely to use tobacco, alcohol, and psychoactive substances, affecting individual well-being, patient care, and the healthcare system. Finally, theoretical and practical implications of results were discussed.

Keywords: Healthcare Professional; Working Conditions, Burnout, Substance Abuse, Mental Health.

Estudo Exploratório do Efeito das Condições de Trabalho dos Profissionais de Saúde Portugueses sobre o Burnout e o Abuso de Substâncias

Resumo: Este estudo explora as perceções de uma amostra de profissionais de saúde portugueses sobre as condições de trabalho e o seu impacto no comportamento e na saúde mental. O intuito é aumentar o conhecimento sobre o impacto destas condições no consumo de substâncias e no *burnout*. A amostra inclui 91 profissionais, com média de 39 anos, sendo 72,4% mulheres, 17,6% médicos e 82,4% enfermeiros. O MBI, o SDS e a WCAS foram os instrumentos de medida utilizados. Apenas 20,9% têm uma visão positiva de suas condições, enquanto 38,5% as consideram desfavoráveis, destacando a precariedade, o ambiente físico e a inadequação de materiais em instituições de saúde. Os resultados destacaram que as condições no setor público são piores do que no privado. O estudo revela um impacto significativo dessas condições nos sintomas de *burnout* e no consumo de substâncias entre os profissionais. Mais de 80% experimentam alta exaustão emocional, e quase 60% exibem níveis elevados de despersonalização. Foram ainda desenvolvidas análises comparativas destas variáveis pelas variáveis sociodemográficas e profissionais. O estudo associa condições adversas de trabalho ao consumo de substâncias como estratégia de enfrentamento não adaptativa ou disfuncional. Os profissionais que experienciam *burnout* têm maior probabilidade de consumir tabaco, álcool e substâncias psicoativas, afetando o bem-estar individual, o cuidado ao paciente e o sistema de saúde. Por fim, foram discutidas as implicações teóricas e práticas dos resultados encontrados.

Palavras-chave: Profissionais de Saúde, Condições de Trabalho, Burnout, Abuso de Substâncias, Saúde Mental.

1. Introduction

In recent decades, there has been an increasing awareness among public authorities about the need to reduce occupational hazards. As a result, general public health policies have been implemented in Europe, along with multiple EU directives for occupational hazard prevention (EU-OSHA, n.d.). The European Pillar of Social Rights, formally proclaimed by the EU institutions in 2017, reflects a joint commitment to providing a healthy, safe, and well-adapted working environment for workers in the EU. The working conditions of employees concern the enterprise that employs them and play a crucial role in the socio-economic governance that ensures its sustainability (Cerniak-Emerych & Golej, 2021).

Health professionals' working conditions have been highlighted in international research. This interest in analysing working conditions in health institutions is related, on the one hand, to the fact that they are seen as a central factor for the expansion of the well-being of society and, on the other hand, to the prior knowledge that the positive working conditions of health professionals are essential to enhance their performance and, as such, they influence the quality of care provided and patient safety (Jarrar et al., 2023).

Although this is not a recent concern, the increasing challenges in health institutions have alerted them to the possible degradation of working conditions and the well-being of health professionals. Some studies reveal inadequate working conditions, which reflect negatively on workers' quality of life and health, affecting physical and mental health and well-being, highlighting the relationship between negative working conditions and the prevalence of burnout syndrome in professionals (Teoh et al., 2021)

Burnout is a psychological syndrome due to high exposure to stressors in the professional context, conceptualised by high emotional exhaustion, depersonalisation, and reduced personal fulfilment (Maslach & Leiter, 2016). Burnout in health professionals has negative individual, family, and organisational implications. It is consistently associated with increased rates of depression, decreased well-being, increased divorce, suicide, medical errors, patient dissatisfaction, and unstable interpersonal relationships. It can also be reflected in the increase in substance use as a strategy to deal with negative emotions or burnout (Airagnes et al., 2021). It entails high social costs, given its impact on the health system due to its economic repercussions (Lacy & Chan, 2018). Recent studies have shown a high prevalence of burnout symptoms among healthcare professionals in Portugal. They consistently report that this has been exacerbated due to the Covid-19 pandemic (e.g. Serrão et al., 2022; Batista et al., 2021).

The literature review of the proposed variables seems to warn of a destructive cycle that culminates in dangerous results for healthcare professionals and patients, institutions, and community. This study aims to understand health professionals' perceptions of their working conditions and acquire more knowledge about the effect of these conditions on substance abuse and burnout.

2. Theoretical Framework

2.1. Work Conditions

Working conditions have been a central issue in the discussion of paid work. Work is a central activity in the lives of individuals. It allows them to form their identity and satisfy their needs. The conditions under which work is performed is relevant to individuals' physical and psychological well-being.

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Working conditions are often considered as being all factors that occur in the work process and affect human beings. These components or factors can be divided into physical and non-physical components (Cierniak-Emerrych & Golej, 2020). The physical component includes physical and material, chemical and biological elements, for example, workspace equipment, lighting, microclimate, noise, etc. The non-physical component relates to elements such as work organisation, time, interpersonal and social relationships as well as living activities.

The working conditions of workers do not only concern the company that employs them, but their relevance is also so significant that these employers must be concerned the socioeconomic governance that guarantees their own sustainability. Workers' health is one of the main concerns of industrialised countries (Coupaud, 2017) and literature has highlighted that psychosocial and physical working conditions interact to impact workers' health (Sundstrup & Andersen, 2021). Therefore, demands on working conditions have been increasing, mainly due to the self-awareness of employees and organisations in terms of ensuring the physical safety and health of the workforce (Ciernial-Emerych & Golej, 2020). The importance of working conditions is also reflected in the European Foundation for the Improvement of Living and Working Conditions, that is, “working condition is a characteristic or a combination of characteristics of work that can be modified and improved. Current conceptions of working conditions incorporate considerations of wider factors, which may affect the employee psychosomatically. Thus, a broader definition of the term includes the economic dimension of work and effects on living conditions” (Eurofund, 2022, n.p.).

Burr (2021) argues that regarding existent research on work and health, there remains a lack of studies on psychosocial and physical working conditions. According to the person-environment fit model, it is suggested that if working conditions are not viable, this can result in mental fatigue (Dewel et al., 2012). The contribution of working conditions to the risk of mental disorders is widely recognised in the literature (Harkko et al., 2023), especially from the point of view of the psychosocial factors that are most portrayed in the literature (Heinomen et al., 2022). Working conditions can create environments with a high risk of occupational stress, including long working hours, time pressure and emotional challenges, and poor physical conditions. These factors can be a source of psychological suffering and globally affect the health and well-being of workers (Asare-Doku et al., 2021).

Although the literature focuses mainly on studying the effect of psychosocial working conditions on the mental health of professionals, there is also evidence that physical working conditions can also affect mental health (Kouvonen et al., 2017). Asare-Doku et al. (2021), concluded that the length of shifts, remuneration and physical working conditions are associated with the physical and psychological well-being of workers and can contribute to the psychological suffering of professionals.

To Health and Social care workers, both psychosocial and physical conditions are associated with mental disorders (Heinomen et al., 2022). In the health sector, physical working conditions are relevant to employment qualities. Poor physical working conditions can cause health problems (Holtermann et al., 2010) and lead to the loss of professionals in this sector (Sewdas et al., 2019). Kairys et al. (2008) concluded that the facility's resources (e.g., technology, laboratories, diagnostic equipment) and the space conditions (e.g., suitability of space, location, distance, etc.) affect employee satisfaction. Recent empirical research shows that working conditions in critical functions and organisations, such as health and education, are less favourable than others (Dütsch, 2022).

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2.2. Burnout

Despite having been recognised for several decades by experts, it was only in 2022 that Burnout was introduced by World Health Organisation (WHO) in the International Classification of Diseases (ICD) as an occupational disease. In ICD-11 (Code QD85), Burnout is defined as "a syndrome conceptualised as resulting from chronic workplace stress that has not been successfully managed. It is characterised by three dimensions: 1) feelings of energy depletion or exhaustion; 2) increased mental distance from one's job, or feelings of negativism or cynicism related to one's job; and 3) a sense of ineffectiveness and lack of accomplishment" (WHO, 2022).

After more than three decades of research, Burnout has been defined in various ways (Yuan & Xu, 2020), but it is evident that it is not just an academic issue. It's a social problem that affects public health in different countries, and its investigation and understanding are still in the early stages (Merek et al., 2017).

Maslach et al. (2001) define Burnout as a prolonged response to continuous interpersonal and emotional stressors in the workplace, comprising three dimensions: emotional exhaustion, cynicism, and reduced personal accomplishment.

Emotional exhaustion is the central component of Burnout and is the most reported by individuals. Emotional exhaustion refers to the feeling of physical and emotional overload. This dimension is a necessary criterion to burnout diagnosis, but it is not sufficient. Limiting burnout syndrome to emotional exhaustion is too limiting for understanding the phenomenon. The cynicism or depersonalisation dimension represents the interpersonal context and refers to a negative response marked by greater sensitivity and detachment to different aspects of work. Personal accomplishment or efficacy is a self-evaluation dimension and refers to the feeling of lack of achievement and work productivity or incompetence. The first two dimensions are elevated, while the third dimension is low in burnout Syndrome. Emotional exhaustion stimulates depersonalisation as a coping strategy for self-protection (Maslach & Jackson, 1981; Maslach et al., 2018; Maslach et al., 2001).

Abramson (2022) highlights the prevalence of burnout as an emerging concern for society and organisations. The author considers that burnout and occupational stress reached the highest levels across all professions. Burnout is not a crisis caused by the Covid-19 pandemic, but it is increased by it, and its effects will be felt far beyond its existence. Abramson (2002) also states that the prevalence of occupational stress among professionals in the USA is 79% in 2021, 38% higher than in 2019. Except for better analysis, no studies reported a decrease in burnout levels in recent years, whether in USA or Europe.

Maslach and Jackson (1982) state that professional caregivers, especially those in education and healthcare environments, are most prone to burnout. While high levels of burnout have been reported across all professions, the literature tends to emphasise a higher prevalence among healthcare professionals (Abramson, 2022; Kagan et al., 2023; West et al., 2018). This prevalence has been commonly associated with the characteristics of the context and nature of the work performed, namely, excessive workload, role overload, role conflict, time and emotional pressure, long working hours, and physical risk due to contact with toxic substances and contagious diseases, as well as a low level of social support and financial rewards considered unfair (Yuan & Xu, 2020). All these conditions place healthcare professionals in a situation of high physical and psychological pressure. The studies conducted during the pandemic period reinforced this relationship.

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The Covid-19 pandemic increased pressure on healthcare systems worldwide and raised levels of burnout in healthcare professionals as never seen before (Baptista et al., 2021). In other words, the negative alteration of the organisational context led to a significant increase in the prevalence of burnout among these professionals.

High levels of burnout have regularly been associated with negative consequences. For example, high levels of burnout were associated with absenteeism, turnover intention, voluntary turnover, job abandonment, low job performance, poor quality of care services, diminished professional identity and high conflict level, more impulsivity, irritability, and hostility (Delgado et al., 2023). Experiencing high levels of burnout syndrome has a direct impact on the health and behaviour of individuals, but also on their professional aspects. Throughout burnout research, high levels of this syndrome have been associated with various adverse health outcomes, namely, sleep disorders, muscular or musculoskeletal pain, headaches, fatigue, hypertension and early cardiovascular disorders, immune deficiency, gastrointestinal disorders, sexual dysfunctions, depression, and other mental dysfunctions (Toker et al., 2012; Adebayo et al., 2023). Serrão et al. (2021) demonstrated, with a Portuguese sample of healthcare professionals, that depression was positively associated with burnout dimensions. Ren et al. (2023) found that high levels of burnout contributed to nurses' psychological distress and low levels of satisfaction within nursing. The authors also found that around 35% of their sample had high levels of psychological distress.

In addition to health issues, we can also identify in the literature the impact on behaviour. In a study with physicians, Patel et al. (2018) highlighted that high levels of burnout increase the likelihood of substance abuse, road accidents, and suicide. In a more recent study (Banerjee et al., 2023), the authors found that the risk of suicide is always higher in the medical profession than in the general population, but in situations of burnout, the risk doubles. Furthermore, the average consumption of alcohol and drugs in the medical profession is higher than that of the general population. At the behavioural level, burnout has been associated with job withdrawal behaviour as absenteeism, turnover and turnover intention, low commitment and performance drops and efficacy. Furthermore, this phenomenon has been seen as "contagious" as it hurts co-workers, affecting their own behaviour and well-being (Burke & Greenglass, 2020).

Burnout is a prevalent issue among healthcare professionals that has negative consequences not only for themselves, but also for patients, healthcare institutions, and the community. The mental health of healthcare professionals is directly relation to healthcare assistance quality. As such, this situation has become a concern for health management (Ren et al., 2023). In a study carried out by West et al. (2018), the authors found that high levels of burnout in healthcare professionals are associated with reduced patient satisfaction and a significant increase in the rate of medical errors. High rates of burnout contribute to increased turnover rates, reduced access to healthcare, and higher costs for organisations and countries (Bykov et al., 2022). Banerjee et al. (2023) confirmed a strong correlation between high levels of burnout and medical errors, patient dissatisfaction, and poor treatment outcomes. The study highlighted the high turnover rates among physicians, leading to a loss of experience and a significant financial burden on healthcare institutions.

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2.3. Substances Abuse

Studies on substance abuse by healthcare professionals have focused mainly on physicians. However, the prevalence among physicians (10%-12%) and nurses (+/- 10%) is equal to or higher than that of the general population (Berge et al., 2009; Besson et al., 2021). Alcohol and substance abuse are two phenomena that affect all dimensions of the quality of life of healthcare professionals, reducing assertiveness in patient management and reducing the quality of care provided. During the Covid-19 pandemic period, substance consumption increased significantly, especially alcohol (Moya-Salazar et al., 2022), and the tobacco consumption (Besson et al., 2021).

Alcohol and drug consumption among health professionals can have serious consequences, both for the individuals involved and the quality of patient care. While not all health professionals engage in substance misuse, those who do may face a range of negative outcomes. The literature indicates that substance use among health professionals can have serious consequences, including: (1) impaired job performance, (2) increased risk of medical errors, (3) potential harm to patients, (4) negative impact to mental health (Berge et al., 2009; Dupont, et al., 2009). Some more recent studies corroborate these data. For example, Telusca et al. (2015) state that substance use by healthcare professionals jeopardises patient health and public health. Fernandes et al. (2017) found that substance use alters behaviour and logical reasoning, consequently affecting decision-making and the proper execution of medical procedures. Additionally, substance use increases the likelihood of suicide, disrupts sleep patterns, raises the probability of cognitive failure, and consequently leads to a higher number of errors (Arble et al., 2023). Moya-Salazar et al. (2022) warn about the poor quality of life among healthcare professionals who consume substances, while Sorge et al. (2020) highlight the association with premature mortality as well as organisational consequences such as decreased productivity, increased absenteeism, and presenteeism. Millar, White, and Zheng (2023) found that the likelihood of a physician with substance use committing fraud is between 50 to 100 times higher than that of a non-consuming physician.

Worrying results were reported in a study carried out in 2008 with 904 physicians (McLellan et al., 2008) long before the Covid-19 pandemic. This study found that 50.3% reported alcohol consumption, 35.9% admitted consuming opioids, 7.9% reported stimulant consumption and 5.9% confirmed consuming other substances. The consumption of substances by healthcare professionals can be driven by the high levels of stress to which they are subject and by the easy and immediate access to medication, narcotics, and psychotropic substances (Berge et al., 2009). More recently, Alexandrova-Karamanova et al. (2016) found that burnout is positively associated with high consumption of fast food, infrequent physical exercise, high consumption of alcohol and painkillers by physicians.

3. Method

This is an exploratory study whose objective is to verify if there is a relationship between these concepts and the specific population of health professionals and their complex work environment. This research uses a quantitative and correlational methodology to analyse the relationship between work conditions, burnout, and substance abuse among healthcare professionals in Portugal.

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3.1. Procedures

Data was collected through an online questionnaire distributed randomly in the last two months of 2022. A questionnaire created using the Google Forms platform was made available to participants via a link shared through social networks (Facebook, Instagram and LinkedIn) following a snowball approach. Participants were briefed on the study's objectives, and their confidentiality was assured. The research adheres to the Declaration of Helsinki standards, ensuring voluntary and anonymous participation, with no compensation provided.

3.2. Sample

The sample was composed of 91 Health Professionals: 72.4% were females, and 27.6% were males; the mean age was 39.00 years old (SD = 10.747 years); 17.6% were physicians, and 82.4% were nurses; 9.9% of the participants held a leadership position; 67% of health professionals have a bachelor's degree, 26.4% have a master's degree and 6.6% have a PhD; 63.7% worked in the public sector, 24.2% worked in the private sector, and 12.1% of health professionals worked in the public and private sectors simultaneously.

As an inclusion criterion, all participants had to be health professionals, physicians or nurses, work in Portugal, and be native or fluent in Portuguese. All participants gave their informed consent to the data collection.

3.3. Instruments

This study describes the characteristics of a given phenomenon or population and the relationships between variables. The researcher analysed and interpreted the facts without being influenced by them.

The data for this study were collected using an online survey. The first part was composed of socio-demographic questions, namely gender, type of health institution (public or private), function (physician or nurse), and position of leadership (leader of the team or service).

The second part is composed of three scales: MBI HSS (Maslach Burnout Inventory – Human Services Survey), WCAS (Working Context Assessment Scale), and SDS (Severity of Dependence Scale):

- MBI HSS – to measure three-dimensional burnout the MBI was used, this is a scale developed by Maslach et al. (1996) and translated and adapted for the Portuguese population by Marques-Pinto, Marôco and Campos (2015). It consists of 3 subscales with 22 items which measures work-related feelings. The subscales showed good reliability: emotional exhaustion (α Cronbach= .93), depersonalisation (α Cronbach= .76), and personal accomplishment (α Cronbach= .85). The answer given in each item varies on a 7-point Likert scale between 0 and 6.
- The WCAS – scale was developed by Mendes in 2007 and later revised by Silva et al. (2020). This subscale has a good reliability (α-Cronbach= .91) and was answered on a 10-point Likert scale.
- SDS – a measurement item on uncontrolled consumption was used adapted from the Severity of Dependence Scale developed by Gossop et al. (1995) and has been validated for the Portuguese population by Espírito-Santo et al. (2019): "I feel that uncontrolled consumption: Tobacco | Coffee | Alcohol | Lawful psychoactive substances | Illicit psychoactive substances". The answer was given on a Likert scale from 0 – Never to 10 – Always.

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4. Results

Table 1 presents descriptive statistics for this study's variables (means, standard deviations, maximum and minimum). High values on the working conditions scale reflect unfavourable conditions. Through the T-Student test [$t(90)=2.58$; $p_{value}=0.006$] it was found that the sample average (M=6.09) is significantly above the midpoint of the scale (5.5). This reflects a negative assessment of the working conditions of healthcare professionals: 38.5% of healthcare professionals rate their work conditions as negative (between 7.1 and 10), 40.6% rate their work conditions as reasonable (between 4 and 7), and 20.9% (between 1 and 3.9) rate them as good.

Table 1: Descriptive statistics of this study's variables

Variables	N	Minimum	Maximum	Mean (M)	Standard Deviation (SD)
Work Conditions	91	1.10	10.00	6.09	2.20
Emotional Exhaustion	91	.56	6.00	4.26	1.32
Personal Accomplishment	91	2.25	6.00	4.26	.88
Depersonalisation	91	.00	5.20	2.34	1.28
Tobacco Consumption	91	1	10	3.65	2.93
Coffee Consumption	91	1	10	4.41	3.33
Alcohol Consumption	90	1	10	2.60	1.75
Licit Psychoactive Substances Consumption	91	1	7	2.44	1.46
Illicit Psychoactive Substances Consumption	91	1	5	1.48	.835

Note: Work Conditions Scale – 1 to 10; MBI Scale – 0 to 6; Substances Abuse - 1 to 10.

Following the reference values proposed by Maslach et al. (2018), a score of ≥27 indicated high emotional exhaustion, ≥10 indicated high depersonalisation, and ≤33 indicated low personal accomplishment. It appears that 82.4% of the participants have a high level of emotional exhaustion, 59.3% a high level of depersonalisation and only 15.4% a low personal accomplishment (Figure 1).

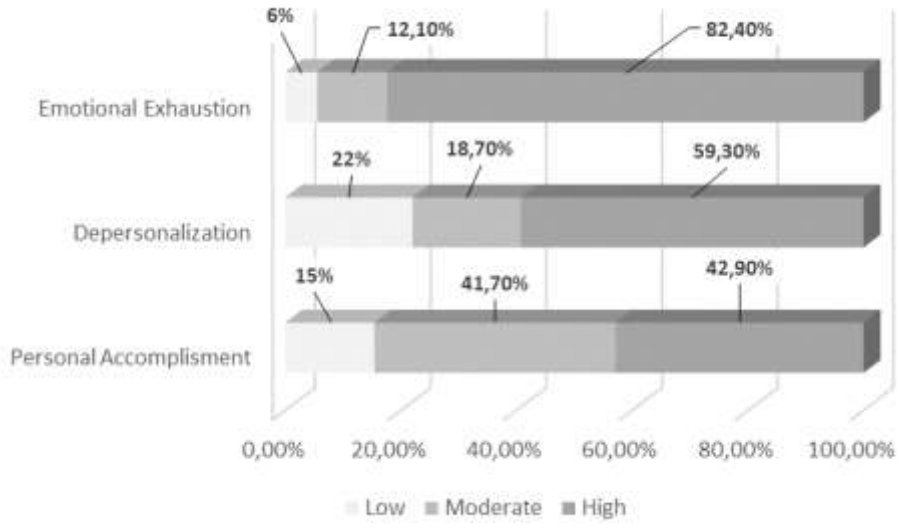

Figure 1: Graphical representation of burnout levels in participants by their dimensions

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Table 2 presents the average of work conditions, emotional exhaustion, personal accomplishment, and depersonalisation categorised by relevant professional and socio-demographic variables. We also conducted a non-parametric test to determine if these variables varied based on the descriptive variables.

A Wilcoxon-Mann-Whitney test was performed to compare work conditions and three burnout dimensions depending on the gender variable. It was found that work conditions (U=694.500; W=994.500; p_{value}=0.559), emotional exhaustion (U=753.500; W=1053.500; p_{value}=0.951), personal accomplishment (U=708.500; W=1008.500; p_{value}=0.652) and depersonalisation levels (U=917.500; W=1217.500; p_{value}=0.124) are not affected by gender. There are no significant differences.

Table 2: Descriptive statistics of work conditions and burnout dimensions by demographic variables

		Work Conditions		Emotional Exhaustion		Personal Accomplishment		Depersonalisation	
		M	SD	M	SD	M	SD	M	SD
Gender	Feminine	6.24	2.18	4.26	1.36	4.27	.95	2.19	1.21
	Masculine	6.00	2.24	4.30	1.31	4.22	.74	2.67	1.41
Healthcare Institution	Public	6.90	1.72	4.41	1.29	4.27	.95	2.58	1.34
	Private	4.83	2.16	4.27	1.28	4.27	.70	2.29	1.05
	Both	4.40	2.54	3.45	1.38	4.18	.90	2.11	1.45
Function	Physician	5.00	2.25	4.30	1.44	4.28	.93	2.44	1.43
	Nurse	6.33	2.13	4.25	1.31	4.26	.88	2.32	1.26
Leader Position	Leader	6.09	2.99	4.81	.79	4.38	.61	2.42	.88
	Not leader	6.10	2.12	4.20	1.36	4.25	.91	2.33	1.32

With regard to the sector of activity, the Kruskal-Wallis test was performed, and the post hoc test (Dunn's test with Bonferroni correction) was run. It was found that the values of emotional exhaustion [$\chi2(2)$=5.434; p_{value}=0.066], personal accomplishment [$\chi2(2)$=0.001; p_{value}=1.000) and depersonalisation [$\chi2(2)$=1.572; p_{value}=0.456] were not affected by the sector of activity. On the other side, the assessment of work conditions [$\chi2(2)$=18.521; p_{value}<0.001] depended on the activity sector. The healthcare professionals who work in public institutions showed levels were significantly higher than those working in the private sector (Z=23.806; p_{value}=0.001) or those working in both sectors (Z=26.556; p_{value}=0.007). That is, the healthcare professionals in the public sector evaluate working conditions more negatively.

As for function, a Wilcoxon–Mann–Whitney test was performed. It was found that function influences the manifest levels of the work conditions. Nurses (M=6.33) evaluate working conditions more negatively than physicians (M=5.00), and this difference is statistically significant (U=812.500; W=3662.500; p_{value}<0.027). Emotional exhaustion (U = 578.500; W=3428.500; p_{value}=0.822), personal accomplishment (U=604.000; W=3454.500; p_{value}=0.967) and depersonalisation levels (U=578.000; W=3428.00; p_{value}=0.818) are not affected by function.

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Regarding leadership positions, the Wilcoxon-Mann-Whitney test was performed. It was found that leadership positions do not influence the work condition assessment (U=365.000; W=3768.000; p_{value}=0.958), nor those the emotional exhaustion level (U=283.500; W=3686.500; p_{value}=0.255), personal accomplishment levels (U=348.000; W=3751.000; p_{value}=0.780) or depersonalisation levels (U=351.500; W=3754.500; p_{value}=0.816).

To group health professionals by burnout manifestation, the Cluster analysis was used. This analysis is an exploratory technique of multivariate data analysis that allows the cluster of individuals into homogeneous groups for specific characteristics, in this case, burnout dimensions. Each observation inside in one group or cluster is like all others belonging to that cluster and different from the observations belonging to other clusters (Hair et al. 2019). The analysis began with hierarchical cluster analysis with the Ward method and used the quadratic Euclidean distance to measure dissimilarity. Additionally, R^2 was used as a decision criterion for the number of clusters we retained. Next, the classification of each subject on retained clusters with the non-hierarchical process, the k-means, was redefined.

Analysing the results of the Ward method, we assumed that the best solution is three clusters. We support our option not only based on the distance between clusters, but also on the R^2. The solution of three clusters retains a significant percentage of the total variability (72%). This solution explains 12% more than the two-cluster (60%) solution and only 6% less than the four-cluster solution (78%). The difference in percentage of total variability between the three and four-cluster solutions is too small to be considered. In addition, the solution is not simple to interpret to obtain one percentage more than 72%, and the difference between clusters is more minor and therefore not recommended. The values of the centroid of each cluster for the three dimensions of burnout are significantly differentiated ($p_{value} \leq 0.001$) in the variables under analysis (Table 3).

Table 3: Cluster Analysis and Explained Variance of Each of the Solutions

	Cluster		
	1	2	3
Emotional Exhaustion	5.04	2.49	4.65
Personal Accomplishment	3.88	4.84	4.36
Depersonalisation	3.47	1.13	1.60

Designations were assigned following the values of the centroids of each of the clusters. Cluster one was called “Burnout Group”. In this cluster, the centroid on emotional exhaustion is the highest, and depersonalisation is moderately high and higher than the value presented by the other groups. Personal accomplishment is moderate but lower than the value present by the other groups. This group is represented by 35.2% of the sample. Cluster two was designed by “Healthy Group”. In this cluster, the centroids of emotional exhaustion and depersonalisation have low values, the lowest in the sample. Personal accomplishment is the highest. This “Healthy Group” is represented by 11% of the sample and is the smallest group in this study. Cluster three is represented by 53.8% of the sample and was called the “Burnout Risk Group”. Emotional exhaustion is high but lower than the value of cluster one; the personal accomplishment is higher than cluster one but

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lower than cluster two. The depersonalisation is lower than cluster one but higher than cluster two. This group is represented by 53.8% of the sample.

The Kruskal-Wallis test was performed, and the post hoc test (Dunn's test with Bonferroni correction) was run to compare the average burnout dimension by cluster or analysis group (Table 4). It was found that the values of emotional exhaustion [$\chi 2(2)=36.667$; $p_{value}< 0.001$], personal accomplishment [$\chi^2(2)=16.000$; $p_{value}<0.001$] and depersonalisation [$\chi^2(2)=60.915$; $p_{value}<0.001$] are significantly different in the groups under analysis. Concerning emotional exhaustion, the value present by Burnout Group is significantly higher than Healthy Group ($Z=6.042$; $p_{value}=0.001$) and the Burnout Risk Group ($Z=3.922$; $p_{value}=0.001$). Compared to the healthy and burnout risk groups, emotional exhaustion values are significantly higher in the burnout risk group ($Z=3.811$; $Pa=0.001$). Regarding personal accomplishment, the Heathy Group had significantly higher values than the Burnout Group ($Z=-3.768$; $p_{value}=0.001$) and Burnout Risk Group ($Z=3.811$; $p_{value}=0.001$). There are no significant differences between the burnout and the risk groups ($Z=-0.187$; $p_{value}=0.851$). Concerning depersonalisation, the Burnout Group had significantly higher values than the Healthy Group ($Z=5.925$; $p_{value}=0.001$) and the Burnout Risk Group ($Z=6.949$; $p_{value}=0.001$). There are no significant differences between the healthy and the burnout risk groups ($Z=-1.634$; $p_{value}=0.102$).

Table 4: Descriptive analysis of burnout dimensions by cluster groups

		Emotional Exhaustion		Personal Accomplishment		Depersonalisation	
		M	SD	M	SD	M	SD
Clusters	Burnout Group	5.16	.72	4.10	.79	3.67	.59
	Burnout Risk Group	4.18	.98	4.15	.85	1.75	.90
	Healthy Group	1.79	.94	5.34	.57	.98	.86

This analysis allows us to understand the essential differences between the three groups of professionals, highlighting their differences in the level of burnout experience. To understand whether groups influence the consumption of substances the Kruskal-Wallis test was carried out (Table 5).

Table 5: Descriptive statistics of substance use by burnout groups

	Tobacco		Coffee		Alcohol		Licit Psychoactive Substances		Illicit Psychoactive Substances	
	M	SD	M	SD	M	SD	M	SD	M	SD
Burnout Group	4.66	3.13	4.78	3.40	2.97	1.53	2.94	1.54	1.69	.93
Burnout Risk Group	3.39	2.83	4.63	3.45	2.56	1.90	2.31	1.40	1.45	.82
Healthy Group	1.70	1.16	2.10	.99	1.60	1.26	1.50	.85	1.00	.00

About coffee consumption there were no significant differences between the groups [$\chi^2(2)=4.560$; $p_{value}=0.102$]. Regarding tobacco [$\chi^2(2)= 10.249$; $p_{value}=0.006$], alcohol [$\chi^2(2)= 7.691$; $p_{value}=0.021$], licit (or legal) substances [$\chi^2(2)= 8.641$; $p_{value}=0.013$], and illicit substances consumption [$\chi^2(2)= 7.409$; p-value=0.025] there were significant differences. Burnout Group has higher tobacco consumption than the healthy group ($Z=3.033$;

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Pa=0.002) and the burnout Risk group (Z=2.098; p_{value}=0.036). The Burnout Group has higher alcohol consumption than the healthy group (Z=2.700; p_{value}=0.007). The Burnout Group has higher licit substances (Z=2.811; p_{value}=0.005) and illicit substances consumption (Z=2.637; p_{value}=0.008) than the healthy group.

Concerning the correlational study of the variables (Table 6), the results show that work conditions significantly correlate with all other variables except coffee consumption. All variables have a positive correlation except for personal accomplishment. When work conditions are evaluated as poor, emotional exhaustion, depersonalisation, and consumption of tobacco, alcohol, licit, and illicit psychoactive substances increase. Personal accomplishment decreases when working conditions are evaluated as bad.

Table 6: Correlational analysis of the variables under study

Variables	1	2	3	4	5	6	7	8
Working Conditions								
Emotional Exhaustion	.349**							
Personal Accomplishment	-.220*	-.374**						
Depersonalisation	.272**	.591**	-.314**					
Tobacco Consumption	.318**	.267*	-.244*	.268*				
Coffee Consumption	-.096	.179	-.266*	.251*	.510**			
Alcohol Consumption	.406**	.147	-.228*	.222*	.601**	.374**		
Licit Psychoactive Substances Consumption	.558**	.277**	-.275**	.378**	.597**	.246*	.670**	
Illicit Psychoactive Substances Consumption	.251*	.270**	-.154	.248*	.497**	.240*	.531**	.689**

Emotional exhaustion significantly correlates with the other two dimensions of burnout, positive for depersonalisation and negative for personal accomplishment. Additionally, emotional exhaustion has a positive and significant correlation with the consumption of tobacco and licit and illicit psychoactive substances. Personal accomplishment has a negative significant correlation with depersonalisation too. However, this dimension of burnout appears as a protector and has a negative significant correlation with the consumption of tobacco, alcohol, and licit psychoactive substances. Depersonalisation is positively and significantly correlated with the consumption of tobacco, alcohol, and both licit and illicit psychoactive substances. Like poor work conditions and emotional exhaustion, depersonalisation can be considered a risk factor for substance use in healthcare settings.

Although the sample size was small and the study exploratory, we conducted multiple regression tests to understand better the possibility of a predictive effect between the variables. First, the effect of working conditions on three dimensions of burnout was tested.

The linear regression showed that working conditions predict emotional exhaustion, personal accomplishment, and depersonalisation (Table 7). The linear regression showed that work conditions positively affect emotional exhaustion [β=0.210; t(89)=3.519; p_{value}<0.001]. The highest working conditions level explains the highest emotional exhaustion levels at 12.2%. Working conditions positively affect depersonalisation [β=0.159; t(89)=2.668; p_{value}<0.001]. The highest working conditions level explains the

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highest depersonalisation levels at 13.8%. Moreover, work conditions negatively affect personal accomplishment [β=-0.220; t(89) = -2.129; p_{value}<0.001]. The working conditions levels explain a slight variance in personal accomplishment, 6.8%. Despite the limitations of this test for the sample size, the results mean that poor working conditions can represent a risk of burnout for healthcare professionals.

Table 7: Linear regression (Enter method) for the effect of working conditions on burnout dimensions

Predictor Variable	Criterion Variable	Z	R^2	B	t	*p*-Value
Working Conditions	Emotional Exhaustion	12.383	0.122	0.210	3.519	<0.01
	Personal Accomplishment	4.533	0.068	-0.220	-2.129	<0.01
	Depersonalisation	7.119	0.138	0.159	2.668	<0.01

The effect of working conditions on substance consumption is tested, too, except for coffee consumption (Table 8). The result showed that poor working conditions can represent a risk of substance use for healthcare professionals. The linear regression showed that working conditions positively affect tobacco consumption [β=0.134; t(89)=3.169; p_{value}=0.002] and alcohol consumption [β=0.324; t(89)=4.170; p_{value}< 0.001]. That is, the highest working conditions level explains the highest emotional tobacco consumption at 10.1% and alcohol consumption at 16.5%.

The effect of working conditions on licit and illicit substance consumption is tested. The effect of working conditions on licit consumption is the most worrying result. The linear regression showed that working conditions positively affect licit substance consumption [β=0.371; t(89)=6.344; p_{value}<0.001]. That is, high values of poor working conditions explain 31.1% of the consumption of licit substances. The effect of working conditions on illicit substance consumption is significant [β=0.095; t(89)=2.44; p_{value}=0.017], but it is slight (6.3%).

Table 8: Linear regression (Enter method) for the effect of working conditions on substance use

Predictor Variable	Criterion Variable	Z	R^2	B	t	*p*-Value
Working Conditions	Tobacco	10.045	0.101	0.134	3.5169	0.002
	Alcohol	17.392	0.165	0.324	4.170	<0.01
	Licit Psychoactive	40.249	0.311	0.371	6.344	<0.01
	Illicit Psychoactive	5.972	.063	0.095	2.44	0.017

The effect of working conditions on licit and illicit substance consumption is tested. The effect of working conditions on licit consumption is the most worrying result. The linear regression showed that working conditions positively affect licit substance consumption [β=0.371; t(89)=6.344; p_{value}<0.001]. That is, high values of poor working conditions explain 31.1% of the consumption of licit substances. The effect of working conditions on illicit substance consumption is significant [β=0.095; t(89)=2.44; p_{value}=0.017], but it is slight (6.3%).

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The effect of burnout dimensions on substance consumption was tested. Table 9 presents the effect of burnout on tobacco consumption. The multiple linear regression with a stepwise method, showed that emotional exhaustion [t(89)=1.318; p=0.191] and personal accomplishment [t(89)=-1.659; p_{value}=0.101] were excluded from the analysis. Depersonalisation is the only burnout dimension that predicts tobacco consumption [β=0.095; t(89)=2.44; p_{value}=0.017]. Tobacco consumption was explained by depersonalisation at 7.2%.

Table 9: Multiple linear regression (stepwise method) for the effect of burnout dimensions on Tobacco consumption

Predictor Variable	Criterion Variable	Z	R^2	B	t	*p*-Value
Depersonalisation	Tobacco Consumption	6.901	0.072	0.612	2.627	0.010

The findings of a multiple linear regression analysis with a stepwise method, presented in Table 10, indicate that only personal accomplishment, and not emotional exhaustion [t(89)=0.625; p_{value}=0.534] or depersonalisation [t(89)=1.544; p_{value}=0.126], was a predictor of alcohol consumption [β=-0.455; t(89)=-2.199; p_{value}=0.030]. The analysis revealed that personal accomplishment explained 5.2% of the variance in alcohol consumption.

Table 10: Multiple linear regression (stepwise method) for the effect of burnout dimensions on alcohol consumption

Predictor Variable	Criterion Variable	Z	R^2	B	t	*p*-Value
Personal Accomplishment	Alcohol Consumption	4.837	0.052	-0.455	-2.199	0.030

The study found that only depersonalisation, one of the three dimensions of burnout, predicts licit substance consumption (Table 11). Emotional exhaustion [t(89)=0.679; p_{value}=0.499] and personal accomplishment [t(89)=-1.697; p_{value}=0.093] were not included in the analysis. The results showed that depersonalisation had a significant effect on licit substance consumption [β=0.430; t(89)=3.851; p_{value} <0.001], explaining 14.3% of the variance in licit substance consumption.

Table 11: Multiple linear regression (stepwise method) for the effect of burnout dimensions on licit substances consumption

Predictor Variable	Criterion Variable	Z	R^2	B	t	p-Value
Depersonalisation	Licit Substances	14.832	0.143	0.430	3.851	<0.001

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Concerning illicit substance consumption (Table 12), the results showed that only emotional exhaustion predicts illicit substance consumption [β=0.171; t(89)=2.648; p_{value}= 0.010]. Personal accomplishment [t(89)=-1.697; p_{value}=0.093] and depersonalization [[t(89)=-1.697; p_{value}=0.093] were excluded of analysis. Emotional exhaustion explains 7.3% of illicit substance consumption.

Table 12: Multiple linear regression (stepwise method) for the effect of burnout dimensions on illicit substance consumption

Predictor Variable	Criterion Variable	Z	R^2	B	t	*p*-Value
Emotional Exhaustion	Illicit Substances	7.013	0.073	0.171	2.648	0.010

It was decided to conduct a multiple regression test to understand the combined impact of working conditions and depersonalisation on legal substance use (Table 13). The results showed that work conditions and depersonalisation combined effect on licit substance consumption and explained 36.7%.

Table 13: Multiple linear regression (stepwise method) for the effect of work conditions and depersonalisation on licit substances consumption

Predictor Variable	Criterion Variable	Z	R^2	β	T-Test	*p*-Value
Work Conditions	Licit Substances	25.468	0.367	0.327	5.600	<0.001
Depersonalisation				0.278	4.219	0.007

5. Discussion

This study aims to understand health professionals' perceptions of their working conditions and acquire more knowledge about the effect of these conditions on their substance abuse behaviour and burnout.

The result showed that only a minority of health professionals (20.9%) perceive their working conditions in their work institutions as positive. Many professionals (38.5%) classify their working conditions as unfavourable. The study examined the working conditions in healthcare institutions in Portugal. It assessed the precariousness of work, the physical environment, noise levels, and inadequacy of materials and equipment for providing adequate services. The study found that working conditions in the public sector were worse than in the private sector. This difference could partially explain why professionals have recently withdrawn from the public sector.

The results related to working conditions are concerning on their own. However, they become even more significant when it is discovered that they can explain the symptoms of burnout and the use of substances such as tobacco, alcohol, and legal or illegal psychoactive substances. These findings mainly concern healthcare professionals, as precarious conditions can impact their health and performance. From the government and society's point of view, precarious working conditions in healthcare institutions can

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jeopardise community health by compromising the quality of services provided directly and indirectly (Anderson et al., 2020).

The data is unequivocal regarding the worrying prevalence of burnout among healthcare professionals, with more than 80% of professionals showing high emotional exhaustion and almost 60% of participants showing high levels of depersonalisation. Additionally, 35.2% of responding healthcare professionals are experiencing burnout and 53.8% are at risk of burnout. The results presented by this study are slightly different from those found previously in studies conducted in Portugal with healthcare professionals. For example, Duarte et al. (2020) demonstrate that 52.5% of healthcare professionals exhibited high levels of personal burnout, and 53.1% exhibited high levels of work-related burnout. In another study, Serrão et al. (2022) found that 70% of healthcare professionals experienced moderate levels of burnout. However, these comparisons deserve some reservations since the burnout scale used was different in the three studies compared. Additionally, in the study by Duarte et al. (2020), the data was collected at the beginning of the Covid-19 pandemic during the declared national state of emergency. Similarly, in the study of Serrão et al. (2022), the data was collected during the state of emergency in 2021. Both studies were conducted during critical periods regarding anti-contagion measures, numbers of infections, and deaths. In the study presented here, the data was collected at the end of 2022, when the pandemic numbers were significantly lower than in the previous studies. In addition to the scales, the differences can be explained by the different data collection contexts, but also by the habituation to the pandemic context. These results may demonstrate that, despite fatigue, healthcare professionals may have developed internal resources to cope with this situation.

The literature frequently associates psychosocial risk factors with burnout (Burr, 2021; Heinomen et al., 2022). The study suggests that physical and material conditions can cause emotional exhaustion, depersonalisation, and decreased personal accomplishment. This relationship can be explained by the personal-environment fit model theory (Dewel et al., 2012), which argues that if one fails to adjust to their surroundings, it can lead to mental fatigue. The self-determination theory (SDT) by Deci and Ryan (2005) also explains the same phenomenon when mentioning that individuals have basic psychological needs that drive them, and the satisfaction of these needs contributes to cognitive and functional balance, leading to a feeling of well-being. The study shows that precarious working conditions can compromise the care and service professionals provide.

When we consider the relationship between working conditions and the consumption of substances, we can view it as a coping mechanism for dealing with adverse situations that cannot be resolved. The rise in substance consumption can be seen as a maladaptive coping strategy, which is a negative approach because it does not address or solve the problem and can be harmful to oneself (Lazarus & Folkman, 1984). The consequences of alcohol and drug consumption by health professionals extend beyond individual well-being to impact patient care and the healthcare system. Identifying and addressing substance use disorders in this population is crucial for ensuring the safety and effectiveness of medical practice. Professional support programs, education, and interventions are essential components of a comprehensive approach to mitigate these consequences and promote the health and well-being of healthcare professionals (Moya-Salazar et al., 2022).

The study results indicate that the level of burnout experienced by physicians and nurses is not influenced by gender or the sector of activity (i.e., public or private). However, nurses tend to have a more negative perception of working conditions than physicians.

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There are no significant differences between the two professions about the manifestation of burnout. These results are in partial agreement with previous literature. However, a study conducted in Saudi Arabia (Alwhaibi et al., 2022) pointed out completely different results, where higher burnout values were found in women, nurses, and younger professionals. In another study carried out in Portugal (Jesus et al., 2023), the authors also found no differences in burnout levels between professions, but they found higher levels of emotional exhaustion in women. The inconsistency of the effect of socio-demographic variables on healthcare professionals' burnout may suggest that working conditions and culture have a more significant impact on this variable.

The results support the literature regarding the relationship between burnout and substance consumption (Patel et al., 2018; Banerjee et al., 2023). In addition to the existing corrections, professionals experiencing burnout show significantly higher tobacco consumption than other professionals and reveal higher consumption of alcohol and legal and illegal substances than healthy professionals.

5.1. Theoretical and Practical Implications

From a theoretical perspective, this study offers a rare perspective by exploring the impact of physical and material work conditions on the mental health of healthcare professionals. This differs from the typical approach of investigating the relationship between psychosocial work conditions and mental health. Through an empirical framework, this study aims to shed light on this critical topic and meet the need exposed by Burr (2021) to carry out more studies that explore the impacts of working conditions on the mental health of professionals.

The data obtained from this study provides support for the sequential model of burnout development that was presented by Leiter and Maslach (1988). According to this model, burnout develops sequentially, where the occurrence of one dimension leads to the development of subsequent dimensions. As a result, high levels of exhaustion are primarily caused by the work environment, leading to the development of cynicism/ depersonalisation. Subsequently, this leads to a decreased sense of self-efficacy (personal accomplishment).

From a practical perspective, a comprehensive understanding of the working conditions in the healthcare industry and their consequences is crucial. This understanding is essential for health professionals, health institution managers, and political decision-makers. Adverse working conditions can be altered and upgraded, so it is essential to contemplate their adverse impacts and implement practical interventions to tackle them (Kouvonen et al., 2017). A workplace intervention had favourable effects on the emotional well-being of professionals and decreased burnout levels (Bourbonnais et al., 2011).

The results obtained can provide valuable insights for institutions and their managers to improve the mental health of their employees by identifying working conditions and implementing corrective measures. However, it is essential to consider the characteristics of individuals, organisations, specialties, and local culture while designing and executing these interventions.

5.2. Limitations and Future Research

There are two main limitations to this study. Firstly, the sample size is too small, which limits the scope of the findings and makes it difficult to generalise the conclusions to other populations. The study's outcomes should be considered exploratory and must be

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tested again with larger sample sizes and more diverse participants. Secondly, the study relies on self-reported data to assess working conditions, which may be biased by respondents' emotional exhaustion levels (Dalgard et al., 2009). More research is needed to explore the relationships between working conditions and employee well-being.

6. Conclusion

This study examines the perceptions of healthcare professionals regarding their working conditions in Portugal, and the results are concerning. While only a minority of professionals view their conditions positively, a significant portion considers them unfavourable. The study reveals the precariousness of work, inadequate physical environments, and insufficient materials in health institutions, particularly in the public sector. These conditions align with the departure of professionals from the public service.

The study also highlights the impact of adverse working conditions on burnout symptoms and substance use among healthcare professionals. High rates of emotional exhaustion and depersonalisation emphasise the need for interventions. Additionally, the study focuses on physical and material conditions, which are often overlooked in psychosocial studies. The study also emphasises the need for a comprehensive understanding of working conditions in the healthcare sector. The results also call for management intervention in working conditions, which can positively impact professionals' mental health.

While the study has limitations, such as a small sample size and reliance on self-reported data, it lays a foundation for further exploration. Future research should employ larger, diverse samples and objective measures to increase generalisability and reliability. This study serves as a critical call to action, urging stakeholders to prioritise and address the complex relationship between working conditions, mental health, and substance use among healthcare professionals, as well as their negative consequences for the entire healthcare system.

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