

Cardiovascular diseases in healthcare workers: risk factors and preventive strategies in Brazil

Doenças cardiovasculares em trabalhadores da saúde: fatores de risco e estratégias preventivas no Brasil

Enfermedades cardiovasculares en trabajadores de la salud: factores factoriales y estrategias preventivas en Brasil

Sara Fernandes Correia¹, Daniel Fernandes Correia Júnior², Alberto César da Silva Lopes³, Marcus Vinicius Ribeiro Ferreira⁴, Gláucia Oliveira Abreu Batista Meireles⁵, Stephanie Brochado Sant'ana⁶, Juliana Macedo Melo Andrade⁷, Marcus Vinicius Dias de Oliveira⁸

How to cite: Correia SF, Júnior DFC, Lopes ACS, Ferreira MVR, Meireles GOAB, Sant'ana SB, et al. Cardiovascular diseases in healthcare workers: risk factors and preventive strategies in Brazil. *REVISA*. 2024; 13(Esp2): 1123-33. Doi: <https://doi.org/10.36239/revisa.v13.nesp2.p1123a1133>

REVISA

1. Evangelical University of Goiás. Anápolis, Goiás, Brazil. <https://orcid.org/0000-0002-3850-9852>

2. Brazilian Company of Hospital Services. Goiânia, Goiás, Brazil. <https://orcid.org/0000-0001-9489-7485>

3. Institute of Higher Education of Brasília. Brasília, Federal District, Brazil. <https://orcid.org/0000-0002-7315-3643>

4. University Center of the Central Plateau Aparecido dos Santos. Brasília, Distrito Federal, Brazil. <https://orcid.org/0000-0002-7315-3644>

5. Municipal Secretary of Health of Anápolis. Anápolis, Goiás, Brazil. <https://orcid.org/0000-0002-4247-7822>

6. Metropolitan Hospital of Urgency and Emergency. Guanabara, Pará, Brazil. <https://orcid.org/0009-0004-5869-8007>

7. Metropolitan College of Anápolis. Anápolis, Goiás, Brazil. <https://orcid.org/0000-0001-9759-1609>

8. Department of Health of the Federal District. Brasília, Distrito Federal, Brazil. <https://orcid.org/0009-0007-9434-0522>

Received: 23/07/2024
Accepted: 12/09/2024

RESUMO

Objetivo: investigar a prevalência de doenças cardiovasculares (DCVs) entre trabalhadores da saúde, com foco nos fatores de risco ocupacionais e nas estratégias preventivas necessárias. **Método:** trata-se de uma revisão bibliográfica nas bases de dados nacionais e internacionais, abrangendo estudos publicados entre 2000 e 2023, com ênfase nos últimos três anos. **Resultados:** os resultados apontam para uma alta prevalência de hipertensão arterial, doença arterial coronariana e insuficiência cardíaca entre esses profissionais, atribuída a fatores como estresse ocupacional crônico, jornadas de trabalho excessivas, turnos irregulares e exposição a ambientes hospitalares adversos. Embora existam intervenções preventivas, como programas de gerenciamento do estresse e regulamentação das horas de trabalho, a implementação dessas medidas tem sido inconsistente e insuficiente. **Conclusão:** é crucial adotar intervenções mais rigorosas e personalizadas, além de realizar pesquisas contínuas e monitoramento das condições de trabalho para adaptar políticas de saúde ocupacional às necessidades dos trabalhadores da saúde, visando proteger sua saúde cardiovascular e melhorar a qualidade do atendimento prestado. Este estudo também propõe uma comparação com dados internacionais para contextualizar os achados no cenário global e sugere recomendações práticas específicas para gestores de saúde pública, visando à melhoria das condições de trabalho e à saúde dos profissionais.

Descritores: Doenças Cardiovasculares; Trabalhadores da Saúde; Saúde Ocupacional.

ABSTRACT

Objective: to investigate the prevalence of cardiovascular diseases (CVDs) among health workers, focusing on occupational risk factors and the necessary preventive strategies. **Method:** this is a literature review in national and international databases, covering studies published between 2000 and 2023, with an emphasis on the last three years. **Results:** the results point to a high prevalence of arterial hypertension, coronary artery disease, and heart failure among these professionals, attributed to factors such as chronic occupational stress, excessive working hours, irregular shifts, and exposure to adverse hospital environments. Although there are preventive interventions, such as stress management programs and regulation of working hours, the implementation of these measures has been inconsistent and insufficient. **Conclusion:** It is crucial to adopt more rigorous and personalized interventions, in addition to conducting continuous research and monitoring of working conditions to adapt occupational health policies to the needs of health workers, aiming to protect their cardiovascular health and improve the quality of care provided. This study also proposes a comparison with international data to contextualize the findings in the global scenario and suggests specific practical recommendations for public health managers, aiming at improving working conditions and the health of professionals.

Descriptors: Cardiovascular Diseases; Healthcare Workers; Occupational Health.

RESUMEN

Objetivo: investigar la prevalencia de enfermedades cardiovasculares (ECV) en trabajadores de la salud, centrándose en los factores de riesgo ocupacional y las estrategias preventivas necesarias. **Método:** se trata de una revisión bibliográfica en bases de datos nacionales e internacionales, que abarca estudios publicados entre 2000 y 2023, con énfasis en los últimos tres años. **Resultados:** los resultados apuntan a una alta prevalencia de hipertensión arterial, enfermedad arterial coronaria e insuficiencia cardíaca entre estos profesionales, atribuida a factores como el estrés ocupacional crónico, el exceso de jornadas, los turnos irregulares y la exposición a ambientes hospitalarios adversos. Aunque existen intervenciones preventivas, como programas de manejo del estrés y regulación de las horas de trabajo, la implementación de estas medidas ha sido inconsistente e insuficiente. **Conclusión:** Es crucial adoptar intervenciones más rigurosas y personalizadas, además de realizar investigaciones y monitoreos continuos de las condiciones de trabajo para adaptar las políticas de salud ocupacional a las necesidades de los trabajadores de la salud, con el objetivo de proteger su salud cardiovascular y mejorar la calidad de la atención prestada. Este estudio también propone una comparación con datos internacionales para contextualizar los hallazgos en el escenario global y sugiere recomendaciones prácticas específicas para los gestores de salud pública, con el objetivo de mejorar las condiciones de trabajo y la salud de los profesionales.

Descriptores: Enfermedades cardiovasculares; trabajadores de la salud; Salud Ocupacional.

REVIEW

Introduction

Cardiovascular diseases (CVDs) are the leading cause of global and national mortality, posing a significant challenge to both health systems and individuals. In Brazil, CVDs are responsible for a significant portion of deaths, according to the Ministry of Health¹. This scenario is especially concerning among health workers, who face working conditions that can significantly increase the risk of developing CVDs.

Healthcare professionals, such as physicians, nurses, nurse technicians, and physical therapists, face a unique combination of physical and emotional stressors, which are significant triggers of CVDs. The hospital environment, characterized by constant pressure to provide high-quality care, handle emergencies, and manage the emotional toll associated with caring for patients, intensifies these risks. In addition, the nature of medical emergencies requires these professionals to make critical decisions under high pressure, often in a context of sleep deprivation and inadequate recovery².

These factors are exacerbated by long working hours and irregular shifts, which interfere with natural circadian rhythms, which are essential for cardiovascular health. Shift work, especially night work, has been consistently associated with metabolic dysfunction, increased blood pressure, and a higher risk of coronary heart disease³. The lack of time for adequate recovery between shifts, combined with prolonged exposure to high-pressure environments, further contributes to the physical and mental wear and tear of these professionals.

Furthermore, the hospital environment presents additional challenges, such as continuous exposure to noise, bright lights and pathogens, which can exacerbate physiological stress. Studies also point to organizational stressors, such as a lack of administrative support, excessive demands and limited resources, which worsen the situation⁴. These factors not only increase the risk of CVDs, but are also beneficial for burnout syndrome, intrinsically linked to the development of cardiovascular diseases.⁵

Recent studies in Brazil highlight that the prevalence of hypertension and other CVDs is significantly higher among healthcare workers compared to the general population⁶. This increase in prevalence is mainly attributed to prolonged exposure to occupational stressors and the lack of adequate prevention and intervention strategies. For example, a study by Pinto and Moraes⁷ revealed that nurses working in intensive care units (ICU) have a 30% higher risk of developing hypertension compared to those working in other hospital units.

Given this scenario, this article aims to review the existing literature on the relationship between the work environment of healthcare professionals and the prevalence of CVDs, identifying the main risk factors and discussing effective preventive strategies. Understanding the mechanisms through which working conditions affect the cardiovascular health of these professionals is crucial for the development of occupational health policies that can mitigate these risks and, consequently, improve the quality of life of health workers, as well as the quality of care they offer their patients. Furthermore, the article proposes a comparison of data obtained with international literature,

positioning Brazilian findings within a global context, highlighting similarities and differences that may influence the formulation of public health policies.

In this sense, the objective of the study was to explore the prevalence of cardiovascular diseases among healthcare workers and identify the main occupational risk factors that contribute to this high incidence.

Methodology

The study used a qualitative approach and literature review method. The review was carefully planned to ensure the inclusion of the most relevant and recent studies, allowing for a robust and up-to-date analysis of the prevalence of CVDs among healthcare workers. The search and selection process for articles followed a rigorous protocol, with the aim of identifying, evaluating and synthesizing the evidence available in the scientific literature.

The bibliographic research was carried out in the SciELO, LILACS and Google Scholar databases, in addition to articles available in recognized national scientific journals, such as *Revista Brasileira de Saúde Ocupacional* and *Cadernos de Saúde Pública*. Furthermore, international databases such as PubMed and Scopus were consulted for comparison with global literature, seeking to understand how Brazilian findings align with or diverge from the international context.

Studies published between 2000 and 2023 were included in the review, with a special focus on the last three years (2020-2023), to ensure the timeliness of the evidence.

Inclusion criteria:

- Empirical studies: Original articles that present quantitative or qualitative data on the prevalence of CVDs, associated risk factors and preventive measures among healthcare workers.
- Systematic reviews and meta-analyses that comprehensively synthesize existing literature.
- Longitudinal and randomized studies that provide robust evidence on causality and effectiveness of interventions.
- Jobs specifically focused on healthcare workers, including doctors, nurses, nursing technicians and other professionals directly involved in patient care.

Exclusion criteria:

- Studies without a specific focus on healthcare workers.
- Studies with inadequate methodologies or small samples.
- Narrative reviews without systematic methodology.

The search strategy used combined terms to maximize the relevance of results: "cardiovascular diseases", "health workers", "occupational stress", "prevalence", "risk factors", "prevention", "burnout", "hours work conditions", "irregular shifts", "hypertension" and "occupational health", combined with Boolean operators (AND, OR). This combination allowed us to locate articles that address specific intersections of interest.

After the initial search, titles and abstracts were reviewed for preliminary screening. Articles that met the inclusion criteria were selected for full reading. During the review of the full texts, data on the studied population, methodology, main findings and conclusions of the authors were extracted. In cases where data were not clear or complete, authors were contacted to provide additional information where possible.

To increase the reliability of the results, the selection and analysis were carried out by two independent reviewers. Any disagreements were resolved by consensus or, when necessary, by a third reviewer.

The extracted data were organized into thematic categories: prevalence of CVDs, occupational risk factors (e.g., stress, workload, irregular shifts) and preventive interventions. The synthesis was qualitative, highlighting trends, patterns and gaps in the literature.

The results were compared between studies to identify consensus and divergences, and critical analyzes were carried out on the methodology used in the reviewed studies, as well as on the generalizability of their findings. Additionally, the review considered the practical implications of the findings for the implementation of occupational health policies aimed at preventing CVDs among healthcare workers.

All sources were properly referenced to ensure respect for the copyright and intellectual property of the original authors. The review process followed the ethical principles of scientific research, ensuring transparency and integrity in the selection, analysis and presentation of results.

Results

The review highlighted an alarming prevalence of CVDs among healthcare workers, highlighting high blood pressure, coronary artery disease and heart failure as the most common conditions. Healthcare professionals are significantly more likely to develop CVDs compared to the general population, due to occupational stressors.

Prevalence of CVDs among health Workers

The reviewed studies indicate that the prevalence of hypertension among nurses can reach 45%⁷. This data is particularly worrying, since hypertension is a primary risk factor for other cardiovascular complications. In comparison, physicians working in high-pressure specialties, such as surgery and emergency, have a prevalence of CVDs greater than 30%³.

In addition, surveys carried out in different regions of Brazil confirm this trend⁶. For example, Paula and Almeida⁶ found that about 38% of the physicians interviewed had high blood pressure levels. This data is in line with international findings, indicating that the challenges faced in Brazil are part of a global problem.

Occupational Stress

Occupational stress has been identified as one of the main risk factors for the development of CVDs among health workers. Chronic exposure to stress elevates cortisol levels, directly impacting cardiovascular health⁸. Ribeiro and Carvalho⁸ demonstrated that professionals subjected to high levels of stress have a significant increase in cortisol levels, associated with increased blood pressure and the risk of coronary artery disease.

Carneiro and Reis⁹ analyzed 20 studies on occupational stress in health workers and revealed that those with high levels of stress are 1.7 times more likely to develop CVDs. Lack of organizational support, work overload, and role conflict are significant contributors to chronic stress in this group.

Other studies, such as the one by Rodrigues and Menezes⁵, point out that occupational stress not only contributes to hypertension, but can also lead to the development of dyslipidemia and insulin resistance, predictors of adverse cardiovascular events. The review suggests that interventions focused on reducing occupational stress are essential to mitigate the risk of CVDs.

Irregular workload and shifts

Excessive workload and irregular shifts, especially night work, were consistently associated with an increased risk of CVDs among health workers. Cassiolato et al.⁴ revealed that professionals who work night shifts are 25% more likely to develop CVDs than those who work regular day shifts.

This increase in risk is attributed to dysregulation of the circadian rhythm, interfering with metabolic and hormonal processes³. Souza and Martins¹⁰ found that professionals who work more than 55 hours a week have higher levels of blood pressure and inflammatory markers, precursors of CVDs.

In addition, Vasconcellos and Silva¹¹ associated night work with a higher incidence of acute cardiac events, such as myocardial infarction. The combination of sleep deprivation, accumulated stress, and metabolic dysfunction contributes to the significant increase in cardiovascular risk in these professionals.

Exposure to environmental factors

The hospital environment, with constant noise, intense light and exposure to chemical substances, plays an important role in increasing cardiovascular risk among health workers. Souza and Martins¹⁰ point out that continuous exposure to hospital noise can lead to increased blood pressure and risk of cardiac arrhythmias.

Intense light interferes with workers' sleep patterns, resulting in circadian rhythm disturbances¹¹. Exposure to chemicals, such as volatile anesthetics and disinfectants, is associated with an increased risk of CVDs, due to systemic inflammation and oxidative stress³.

Summary of results

The findings indicate that health workers face a unique combination of occupational risk factors that contribute to the high prevalence of CVDs. It is necessary to address excessive workload, irregular shifts, occupational stress, and exposure to environmental factors through specific interventions. While the studies offer a comprehensive view, there is still a need for more longitudinal research and evidence-based interventions to mitigate these factors.

Discussion

The high prevalence of CVDs among healthcare workers reflects occupational risk factors that are often not adequately addressed by occupational health policies. Existing interventions, such as stress management programs and regulation of work hours, have been insufficient or inconsistent.

Insufficiency of current interventions

Although implementing stress management programs and regulating working hours are recommended strategies, a review of studies indicates that their practical application faces several barriers. In many cases, these programs are underutilized or not sufficiently tailored to the specific needs of health workers. For example, stress management programs have demonstrated effectiveness in controlled settings, but their adoption in hospital settings may be limited by factors such as lack of time, insufficient organizational support, and stigma associated with seeking psychological help.⁹.

Furthermore, regulation of working hours, essential to reduce physical and mental burden, is not consistently applied. Studies indicate that, despite established guidelines to limit weekly working hours, many healthcare professionals continue to face excessive working hours, exacerbated by unexpected demands, such as those faced during the COVID-19 pandemic². Lack of adherence to these regulations compromises workers' health and can negatively impact the quality of patient care.

Need for Customized Occupational Policies

Occupational health policies should consider individual differences, such as age, gender, and specialty, which influence vulnerability to stress and other risk factors^{5,8}. Younger nurses may have different risks of burnout and CVDs compared to experienced physicians, due to differences in job expectations, organizational support, and family responsibilities. In addition, medical specialties influence exposure to risk; Physicians in surgical or emergency specialties face high-pressure situations, increasing vulnerability to chronic stress¹¹.

These observations are corroborated by international studies, which also indicate the importance of tailored occupational policies to meet the specific needs of different groups within the workforce. In countries such as Sweden and Canada, occupational health policies that consider factors such as gender and medical specialty have shown greater effectiveness in reducing stress and promoting cardiovascular health. The implementation of similar programs in

Brazil could bring significant benefits by adapting the successful strategies of other countries to local realities.

Challenges in implementing preventive measures

The implementation of preventive measures faces significant challenges that need to be overcome for interventions to be effective. One of the main obstacles is the organizational culture in many hospital settings, which may not adequately support the health and well-being of workers. Pressure for productivity and stigma regarding help-seeking discourage participation in occupational health programs⁶.

Another challenge is the lack of resources dedicated to promoting workers' health. In many hospitals, the prioritization of resources is directed at patient care, with little emphasis on the health of the workers themselves. This results in underfunded prevention programs and a lack of comprehensive initiatives to address occupational risk factors¹². Without strong organizational commitment and adequate resources, interventions are unlikely to achieve the impact needed to reduce the prevalence of CVDs among these professionals.

Analysis of international studies reveals that these challenges are common in many countries, especially in nations with overburdened or crisis-ridden health systems. However, in some regions, such as Scandinavia, public policies aimed at promoting the well-being of health workers have been more effective, thanks to a greater allocation of resources and the strengthening of the organizational culture focused on occupational health. Adapting these successful strategies to the Brazilian context could be an important step towards overcoming existing challenges.

Implications for practice and policymaking

The findings of this review have important implications for practice and policymaking. Firstly, there is an urgent need to promote an occupational health culture that values the well-being of workers as much as the quality of patient care. This includes normalizing participation in stress management programs and strengthening policies governing working hours.

Furthermore, occupational health policies must be re-evaluated and adapted to consider diversity within the healthcare workforce. Personalizing interventions for different subgroups can significantly increase the effectiveness of preventive measures. Specific programs for women, professionals in high-pressure specialties, and younger workers must be developed and implemented to address the particular needs of these groups.

Finally, the integration of digital health technologies, such as stress monitoring and cardiovascular health apps, may offer new opportunities for personalized prevention. The use of these technologies can facilitate continuous monitoring of workers' health and provide valuable data for the development of more targeted interventions.¹¹

These considerations are in line with the most advanced international practices, where the adoption of digital technologies for monitoring occupational health has proven to be an effective strategy for preventing CVDs. Countries such as the United States and the United Kingdom have invested in digital platforms that allow healthcare workers to monitor their stress levels and cardiovascular health in real time, offering immediate

feedback and personalized interventions. Implementing similar solutions in Brazil could significantly improve the effectiveness of occupational health policies.

Limitations of review

It is important to recognize the limitations of this review. Most of the included studies were conducted in specific contexts, such as hospitals in urban regions, which may limit the generalizability of findings to other healthcare work environments, such as rural clinics or community health units. Furthermore, the review focused on publications available in specific databases, which may have excluded relevant studies published in other languages or in less accessible sources.

Furthermore, although the review included recent studies to ensure the timeliness of the evidence, the rapid evolution of the work environment, especially due to the COVID-19 pandemic, may have introduced new dynamics that have not yet been fully captured in the literature. Future research should continue to explore these developments and evaluate the effectiveness of interventions implemented in recent years.

These limitations are similar to those found in international reviews, where the diversity of contexts and variability in data collection methods also present challenges to the generalization of results. However, recognizing these limitations is crucial for developing more informed public policies and conducting future research that can address these gaps.

Conclusion

The evidence compiled in this review highlights the alarming prevalence of cardiovascular diseases (CVDs) among healthcare workers, attributed to a combination of occupational risk factors that are often underestimated or inadequately addressed. Chronic exposure to occupational stress, long working hours, irregular shifts and adverse work environments create a high-risk scenario that requires urgent attention and specific interventions.

Strict regulation of working hours emerges as a central strategy to mitigate the risks associated with work overload. Limiting the number of hours worked per week and ensuring adequate rest periods are essential measures to reduce the impact of excessive work on the cardiovascular health of healthcare professionals. Reviewed studies indicate that controlled working hours not only improve the physical health of workers, but also contribute to a better quality of patient care, creating a virtuous cycle of benefits for the entire healthcare organization.

Additionally, effective stress management programs are key. The implementation of such programs must go beyond simply offering resources; It is necessary to create an organizational culture that values and encourages active participation in these programs. Interventions such as mindfulness techniques, psychological support and training for managing high-pressure situations have been shown to be effective in reducing cortisol levels and other stress markers, thus reducing the risk of CVD. However, for these interventions

to be successful, it is crucial that healthcare workers have easy access to these programs and feel supported by management in seeking mental health care.

Promoting healthy lifestyles should also be a priority. Initiatives that encourage regular physical exercise, a balanced diet and smoking cessation are essential in preventing CVDs. Healthcare workplaces should facilitate access to physical activities, such as gyms or walking groups, and promote health campaigns that address nutrition and general well-being. Additionally, consideration should be given to implementing policies that support work-life balance, for example offering flexible working hours or teleworking options where applicable.

The review also highlights the importance of ongoing research and monitoring of working conditions. As work environments evolve, especially in response to challenges such as pandemics, it is crucial that occupational policies and practices are adapted to meet the emerging needs of healthcare workers. Longitudinal studies and research focused on specific subgroups within the healthcare workforce can provide valuable insights for developing more effective and personalized interventions.

Finally, the final considerations of this review point to the need for a solid organizational commitment to the health and well-being of healthcare workers. Protecting the cardiovascular health of these professionals is not only a public health issue, but also an ethical issue, which involves recognizing the intrinsic value of the healthcare worker as an individual and the importance of their role in maintaining effective and sustainable healthcare systems. . The interventions recommended in this review not only have the potential to reduce the prevalence of CVDs among healthcare workers, but also to improve the resilience and quality of life of these professionals, ensuring that they can continue to perform their critical roles in a safe and effective manner. Comparison with successful international strategies suggests that, with appropriate adaptation, these interventions can be implemented effectively in Brazil, promoting the health and well-being of healthcare workers on a global level.

Acknowledgment

This study was financed by the authors themselves

References

1. Brasil. Ministério da Saúde. Doenças crônicas não transmissíveis no Brasil: fatores determinantes e recomendações estratégicas [Internet]. Brasília: Ministério da Saúde; 2020 [acesso em 15 set. 2024]. Disponível em: https://bvsms.saude.gov.br/bvs/publicacoes/doencas_cronicas_nao_transmisiveis_brasil.pdf
2. Silva IC, Soares RA. O impacto do estresse ocupacional em médicos brasileiros durante a pandemia de COVID-19. *Rev Bras Epidemiol.* 2021;24. doi: <http://dx.doi.org/10.1590/1980-549720210004>
3. Monteiro HL, Santos RM. Trabalho noturno e riscos à saúde cardiovascular em enfermeiros brasileiros: uma revisão integrativa. *Rev Latino-Am Enfermagem.* 2020;28. doi: <http://dx.doi.org/10.1590/1518-8345.3228.3335>
4. Cassiolato FL, Silva MC, Pereira AC, Oliveira RS, Souza JR, Lima PF. Turnos de trabalho, saúde cardiovascular e qualidade de vida: estudo em profissionais de saúde em um hospital universitário no Brasil. *Cad Saúde Pública.* 2020;36(2). doi: <http://dx.doi.org/10.1590/0102-311X00012319>
5. Rodrigues CS, Menezes AM. Síndrome de burnout e seu impacto na saúde cardiovascular dos profissionais de saúde: revisão de estudos brasileiros. *Arq Bras Cardiol.* 2020;114(3):570-577. doi: <http://dx.doi.org/10.36660/abc.20190072>
6. Paula GS, Almeida RM. Fatores de risco para doenças cardiovasculares em profissionais de saúde: uma revisão da literatura nacional. *Rev Bras Enferm.* 2021;74(4). doi: <http://dx.doi.org/10.1590/0034-7167-2020-0534>
7. Pinto RS, Moraes ST. A prevalência de hipertensão arterial em profissionais de saúde do SUS: estudo transversal. *Rev Saúde Pública.* 2021;55:25. doi: <http://dx.doi.org/10.11606/s1518-8787.2021055003341>
8. Ribeiro AB, Carvalho JE. Exposição ocupacional a fatores de risco e doenças cardiovasculares em trabalhadores da saúde: uma análise crítica. *Saúde Soc.* 2020;29(3). doi: <http://dx.doi.org/10.1590/S0104-12902020190332>
9. Carneiro MAD, Reis FP. Impacto do estresse ocupacional na saúde cardiovascular de profissionais de saúde: uma revisão sistemática. *Rev Bras Saúde Ocup.* 2020;45. doi: <http://dx.doi.org/10.1590/2317-6369000000020>
10. Souza CC, Martins MA. Exposição a ruído ocupacional e hipertensão arterial em trabalhadores da saúde no Brasil: um estudo de caso. *Rev Bras Med Trab.* 2020;18(3):243-250. doi: <http://dx.doi.org/10.5327/Z1679443520190400>
11. Vasconcellos MM, Silva CA. Estilo de vida e saúde cardiovascular em trabalhadores da saúde: estudo de intervenção em hospitais públicos. *Rev Bras Ativ Fís Saúde.* 2021;26. doi: <http://dx.doi.org/10.12820/rbafs.26e0112>
12. Machado MH, Oliveira ES, Moyses NM, Lemos W, Wermelinger M, Vieira M. Estudo de perfil dos profissionais de saúde no Brasil: distribuição, formação,

Correia SF, Júnior DFC, Lopes ACS, Ferreira MVR, Meireles GOAB, Sant'ana SB, et al
trabalho e desafios. Cad Saúde Pública. 2020;36(8). doi:
<http://dx.doi.org/10.1590/0102-311X00182119>

Correspondent Author

Marcus Vinícius Dias de Oliveira
QN 106 Set 1 Block E Entrance B Lot 1 Apartment 105.
CEP: 72302151. Fern. Brasília, Federal District, Brazil.
marcus.sesdf@gmail.com