

## Occupational risks in the practice of the nursing team in the Mobile Emergency Care Service

### Riscos ocupacionais na prática da equipe de enfermagem no Serviço de Atendimento Móvel de Urgência

### Riesgos laborales en la práctica del personal de enfermería en el Servicio de Atención Móvil de Urgencias

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**Objective:** to analyze the occupational risks faced by the nursing team working in the Mobile Emergency Care Service and what containment measures are implemented. **Methods:** Integrative Review, with the inclusion of studies from 2018 to 2023. The searches were carried out in the National Library of Medicine and Scientific Electronic Library Online, Medical Literature Analysis and Retrieval System Online (MEDLINE/PUBMED) via National Library of Medicine e Scientific Electronic Library Online, with the descriptors and Medical Subject Headings: *riscos ocupacionais, enfermagem; acidentes de trabalho*; Occupational risks; Nursing; Accidents, Occupational; Work accidents; *Riesgos laborales; Enfermería; Accidentes de trabajo*, in Portuguese, English and Spanish. **Results:** 298 articles were initially identified, of which nine were considered relevant to this study. From the analysis, 10 categories were created. It was evident that occupational risks are considered more prevalent in the professional category of the nursing team of the Mobile Care Service because they constitute a complex process, and with determining factors such as stress and emergency/urgency procedures, which have been potential motivators illness, often leading to team exhaustion. **Conclusion:** it was possible to identify several occupational risks among workers in the nursing category: physical, chemical, psychological and ergonomic, all with a significant association with work accidents.

**Descriptors:** Occupational risks; Nursing; Accidents, Occupational.

**Objetivo:** analisar os riscos ocupacionais enfrentados pela equipe de enfermagem que atua no Serviço de Atendimento Móvel de Urgência e quais são as medidas de contenção implementadas. **Método:** revisão Integrativa, com a inclusão de estudos dos anos de 2018 a 2023. As buscas foram realizadas na *National Library of Medicine e Scientific Electronic Library Online, Medical Literature Analysis and Retrieval System Online (MEDLINE/PUBMED)* via *National Library of Medicine e Scientific Electronic Library Online*, com os descritores e os *Medical Subject Headings*: *riscos ocupacionais, enfermagem e acidentes de trabalho*; Occupational risks; Nursing; Accidents, Occupational; Work accidents; *Riesgos laborales; Enfermería; Accidentes de trabajo*, nas línguas portuguesa, inglesa e espanhola. **Resultados:** 298 artigos foram identificados inicialmente, desses, nove foram considerados como relevantes para este estudo. A partir da análise foram construídas 10 categorias. Evidenciou-se que os riscos ocupacionais são considerados mais prevalentes na categoria profissional da equipe de enfermagem do Serviço de Atendimento Móvel em virtude de constituírem um processo complexo, e com determinantes fatores como stress e procedimentos de emergência/urgência, os quais têm sido potenciais motivadores de adoecimento, levando muitas vezes à exaustão da equipe. **Conclusão:** foi possível identificar diversos riscos ocupacionais entre os trabalhadores da categoria da enfermagem: físico, químico, psíquico e ergonômico, todos com significativa associação com acidentes de trabalho.

**Descritores:** Riscos ocupacionais; Enfermagem; Acidentes de trabalho.

**Objetivo:** Analizar los riesgos laborales a los que se enfrenta el personal de enfermería que trabaja en el Servicio de Atención Móvil de Urgencias y las medidas de contención implantadas. **Método:** Revisión integradora, incluyendo estudios desde 2018 hasta 2023. Las búsquedas se realizaron en la *National Library of Medicine and Scientific Electronic Library Online, Medical Literature Analysis and Retrieval System Online (MEDLINE/PUBMED)* a través de *National Library of Medicine and Scientific Electronic Library Online*, con los descriptores y *Medical Subject Headings*: *Riscos ocupacionais, enfermagem e acidentes de trabalho*; Occupational risks; Nursing; Accidents, Occupational; Work accidents; *Riesgos laborales; Enfermería; Accidentes de trabajo* en portugués, inglés y español. **Resultados:** Se identificaron inicialmente 298 artículos, de los cuales nueve se consideraron relevantes para este estudio. A partir del análisis, se construyeron 10 categorías. Se constató que los riesgos laborales se consideran más prevalentes en la categoría profesional del personal de enfermería del Servicio de Asistencia Móvil por tratarse de un proceso complejo, con factores determinantes como el estrés y los procedimientos de urgencia/emergencia, que han sido potenciales motivadores de enfermedad, llevando muchas veces al agotamiento del personal. **Conclusión:** Fue posible identificar diversos riesgos laborales entre los trabajadores de enfermería: físicos, químicos, psicológicos y ergonómicos, todos ellos asociados de forma significativa a los accidentes de trabajo.

**Descritores:** Riesgos laborales; Enfermería; Acidentes de trabajo.

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## INTRODUCTION

**M**obile Pre-Hospital Care (*Atendimento Pré-Hospitalar Móvel - APHM*) in Brazil is carried out by Mobile Emergency Services (*Serviços Móveis de Urgência - SAMU*) whereby the assistance is offered outside the hospital environment, with the objective of reaching victims before the worsening of the health problem, ensuring the mitigation of sequelae or death of individuals<sup>1</sup>.

In Brazil, the National Emergency Care Policy Decree No. 5,055, of April 27, 2004, establishes SAMU as a component of the Unified Health System (*Sistema Único de Saúde - SUS*) in an integrated manner, with the other urgent and emergency services available<sup>2</sup>. SAMU's perspective is to provide emergency mobile pre-hospital care, quickly and efficiently, in cases of trauma, poisoning, burns, cardiovascular problems, among others<sup>3</sup>.

In this scenario, it is observed that the professionals of the SAMU nursing team are exposed to a large number of occupational risks that constitute the performance of their activities and that can cause harm to health, through the emergence of diseases and/or work accidents<sup>4</sup>.

The literature conceptualizes risk as the possibility of the occurrence of certain event, immediate or remote damage, which can be isolated or include several factors simultaneously<sup>4</sup>. Therefore, this study aimed to analyze the occupational risks faced by the nursing team that works in the Mobile Emergency Care Service and the containment measures that are implemented.

## METHODS

This is an Integrative Literature Review, carried out between the months of August and September 2023. We chose the integrative review as it is a clear and objective construction, in addition to the comprehensive analysis of studies, enabling discussions on learning strategies and research results, as well as critical reflective thinking to assist in decision making<sup>5</sup>.

The integrative review was structured based on different steps, following the production stages<sup>6</sup>: Elaboration of the research question; Definition of inclusion and exclusion criteria for sample selection; Representation of articles found in table format; Analysis of the articles found individually by 2 researchers and, when doubts arose, they were clarified by a third author, according to the criteria previously chosen as a group; interpretation of results; and an informed presentation of the findings.

The eligibility criteria were based on the mnemonic strategy and the acronym PICO was used to develop the question as a search strategy, which requires an appropriate meaning with

a research question and the creation of a logical structure for the search for scientific evidence, of so that each letter represents a component of the question, with P: (Problem), I: (intervention), C: (comparison) and O: (outcome). It is evident that the research was based on the PICO strategy, an acronym for Problem, Phenomenon of Interest and Context<sup>7</sup>.

**Chart 1.** Description of the PICo<sup>8</sup> strategy. Campina Grande, Paraíba, Brazil, 2023.

PICo		Description
P	Population	Nursing team
I	Phenomenon of Interest	Occupational risk
Co	Context	Occupational risks in the practice of the nursing team in the ambulance service and the prevention measures adopted to minimize these risks

To support the study, searches were carried out in the following databases: Latin American and Caribbean Literature in Health Sciences (LILACS), Medical Literature Analysis and Retrieval System Online (MEDLINE/PUBMED) via the National Library of Medicine and Scientific Eletronic Library Online (SciELO). To combine terms, the Boolean operators “AND” and “OR” were used. The Health Science Descriptors (*Descritores de Ciências da Saúde - DeCS*) in Portuguese, Spanish and English and Medical Subject Headings (Mesh) were considered: *Riscos ocupacionais*, *Enfermagem* and *Acidentes de trabalho*; Occupational risks; Nursing; Accidents, Occupational; Work accidents; *Riesgos laborales*; *Enfermería*; *Acidentes de trabajo*.

This study followed the guidelines of the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews (PRISMA), which aim to make the stages of search, identification, selection, analysis, evaluation and synthesis of research transparent, as they evaluate the effects of health interventions, regardless of the method applied in the research<sup>9</sup>.

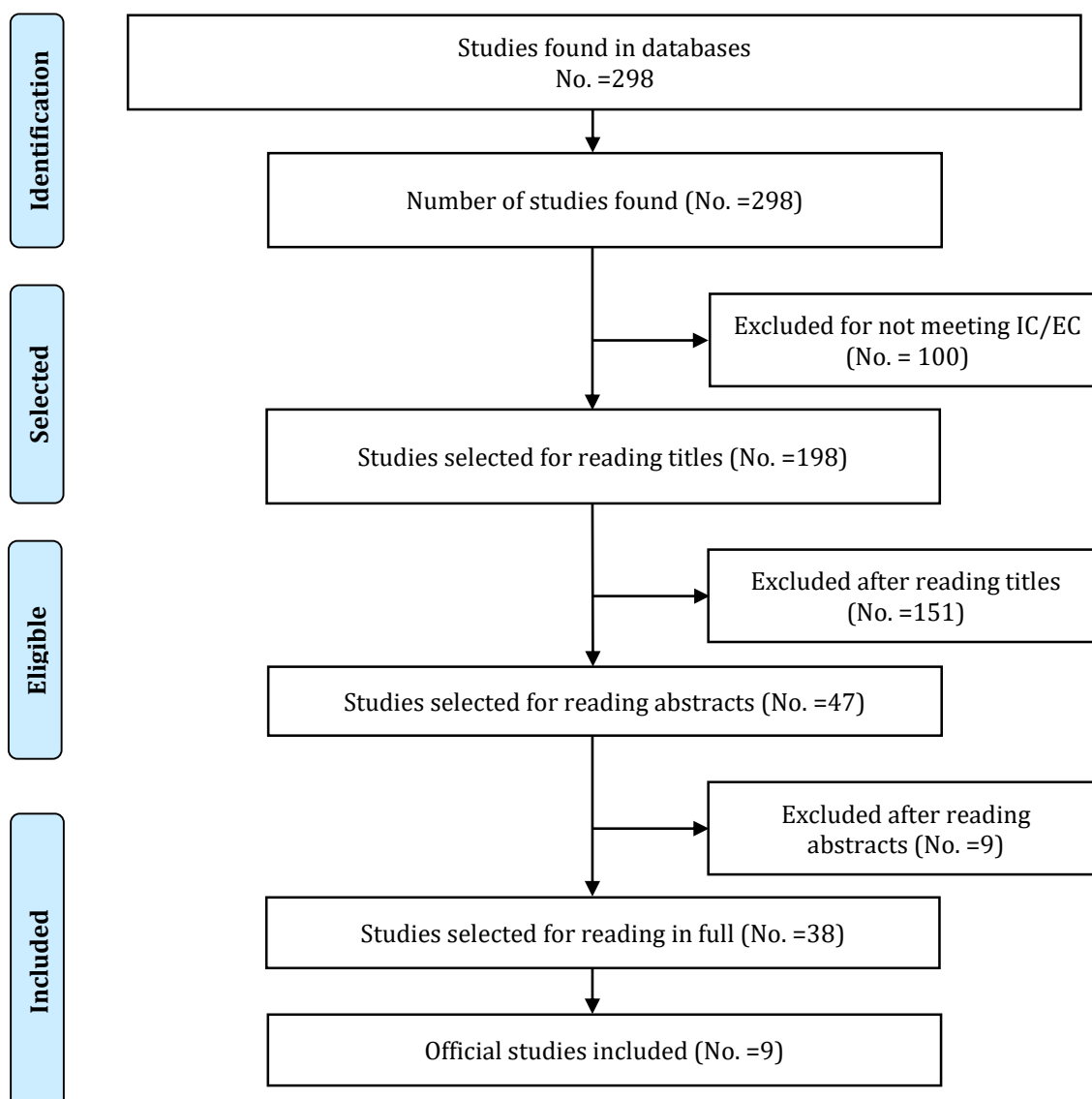
In order to select studies that met the research question, inclusion criteria were adopted, namely: studies that prioritize the approach to occupational risks in the practice of the nursing team in the ambulance service, strategies for preventing and reducing these risks and policies health issues related to occupational safety in the area, studies in English, Portuguese and Spanish, studies published in the last five years (2018 to 2023), in article format and with full text available. After applying the inclusion criteria, the articles were selected by title and summary and, after that, read in full to compose the integrative review. The exclusion criteria were: duplicate articles, editorials, letters to editor, commentary and abstracts of proceedings.

The research took place in three stages. In an initial phase, with the aim of identifying the keywords used most frequently in titles and abstracts, as well as the indexing terms used in the literature.

## RESULTS

The search process favored the identification of 298 studies, 02 (0.6%) articles from other data sources, 29 (9.6%) were excluded due to duplication, 270 (90.3%) were selected for reading title and abstract, 234 (78.3%) were excluded after applying the inclusion and exclusion criteria and because it was not possible to identify a direct relationship with the theme, from this, 35 (12%) were separated and read in full for selection of this research, of these, 09 (3%) were selected to compose this integrative review, resulting in the sample composition of 09 articles.

**Figure 1** - Study selection flowchart. Campina Grande, Paraíba, Brazil, 2023.



Source: Latin American and Caribbean Literature in Health Sciences (LILACS), Scientific Electronic Library Online (SciELO), Medical Literature Analysis and Retrieval System Online (Medline™), 2023.

Regarding the languages of the studies, most were in Portuguese, with 05 articles (60%), followed by English, with 04 articles (30%) and finally, with a lower proportion of articles, Spanish, with 01 article (10%). Regarding the years of publication of the articles, most of them were published in 2021, 04 articles (40%). It is noteworthy that, in 2019, only one production was found (10%), and, in 2020 (20%) and 2023 (20%), similar publications were found. Regarding the methodological profile, exploratory descriptive studies with a cross-sectional design predominated (40%) of the research.

From the articles considered, 10 categories were constructed: *Unhealthy environments*, *Work as a motivating factor for illness*, *Nursing team work in emergency services versus occupational risks*, *Risks inherent to work in emergency services*, *Biological risks*, *Physical risk*, *Ergonomic risk*, *Psychosocial risks*, *Measures and strategies to combat occupational risks* and *Use of PPE*.

## DISCUSSION

### *Unhealthy environments*

In health, the nursing category is the one that occupies the number of professionals in most teams, this category has as attributes the hierarchy of functions and inadequate exposure to environments, thus becoming unhealthy. In the midst of this, employee absenteeism from work occurs, which may be caused by illness<sup>10</sup>. In this scenario, it is clear that the risks present for SAMU professionals are highlighted by the fact that they frequently experience an emergency and urgent work routine in homes or public roads, being exposed to various risks<sup>11</sup>.

It is significant to highlight that the unhealthy environment is not limited to the rescue site alone, as the practice of moving procedures, contact with organic materials, transport of the patient on a stretcher and board, the height of the shelves and the type of protection used to preventing materials from falling, bags of intervention materials, height and length of the ambulance and the professional's chair are present risk factors<sup>12</sup>. From this, it is clear that the damage arising from occupational risks can go well beyond physical ailments, and can affect the emotional and psychological health of health professionals who provide assistance at SAMU<sup>11</sup>.

### *Work as a motivating factor for illness*

The World Health Organization (WHO) defines health as the state of complete physical, mental and social well-being regardless of the absence of disease<sup>13</sup>. In this sense, the motivating factor for the illness of the nursing team has been recorded for some reasons such as work overload, stress and economic concerns, including unhealthy conditions<sup>14</sup>.

From this perspective, SAMU is a service that requires a lot of physical and mental effort from health professionals, as they must be prepared to face adverse situations when called upon to provide assistance in incidents. This is due to the frequency of urgent and emergency care, which causes stress, exhaustion and consequently mental fatigue, as the care often involves a risk of death, meaning that the nursing professional is ready and dedicates themselves to the maximum. From this, work has a direct influence on the lives of SAMU workers, affecting their quality of life<sup>15</sup>.

Stress, when added to daily work, has the potential to increase the risk of illness, reducing the professional's ability to perform<sup>15</sup>. Cognitive ability decreases, consequently adverse events and failures occur<sup>16</sup>.

It is observed that the diagnosis of occupational diseases has encountered difficulties, as they require the activation of social security rights that often do not take into account the causal factors of the disease in the workplace<sup>15</sup>.

### ***Nursing team work in emergency services versus occupational risks***

According to the Brazilian Association of Emergency Nursing (*Associação Brasileira de Enfermagem em Emergência - ABENEM<sup>2</sup>*), professionals who work in the urgent and emergency area need to be prepared to carry out quick and precise interventions, in addition, to guarantee the stabilization and safe transport of patients. Occupational risks are considered the most prevalent accidents, as they are related to greater care practices with invasive procedures and patient management<sup>11</sup>.

The increase in occurrences in SAMU, in view of the increase in the Brazilian population, which requires this service in situations of illness, has been causing concern for the health area<sup>14</sup>. Nursing team workers, especially those who work in SAMU, are exposed to more occupational risks than workers who carry out activities in the hospital environment, since victim care occurs in different locations and in the most different circumstances<sup>17</sup>.

As a routine, they face various situations that leave them vulnerable to occupational risks, such as difficult to access places, insecurity at the scene of the incident, carrying out activities in a static or moving vehicle, working in low light, heat, rain, cold, intense flow of vehicles, presence of animals, population disturbance, people with aggressive behavior and others<sup>17-18</sup>.

### ***Risks inherent to work in emergency services***

In a study carried out with 69 SAMU health professionals in the city of Teresina, in the state of Piauí, it was observed that the most prevalent occupational risks were physical: 87% of siren noises; 79.7% of car collisions as the main accident risk; 79.7% of weight lifting as the

main ergonomic risk; 89.9%, of blood as the main biological risk; and 63.8% of dust as the main chemical risk. It is noteworthy that 82.6% highlighted stress as the main psychosocial risk<sup>17</sup>.

Occupational risks are present in all stages of the care process carried out by SAMU professionals, from the time of the call for assistance to the referral of the patient to the reference service. Consequently, it becomes an exhausting service and prone to occupational diseases<sup>19</sup>.

### ***Biological risks***

Biological risks can be related to bacteria, viruses, septic waste and infestations. Health professionals who provide assistance at SAMU are potentially exposed to occupational risks, particularly biological ones, as they deal directly with invasive procedures, exposure to blood and other fluids. With this in mind, it is understood that safety measures, detection and mitigation of biological risks must be planned according to the activity carried out by each professional category, so that safety at work can be promoted<sup>20</sup>.

Nursing is a category of constant exposure, due to direct contact with body fluids and secretions, with the most prevalent occupational risks being biological. These risks are identified for nursing professionals at SAMU, through exposure to contaminated secretion and/or excretion; blood; exposure to bacteria; handling and contact with hygiene products; contact with medicines and solutions; exposure to viruses. In summary, accidents involving sharp objects are the most frequent<sup>21</sup>.

This highlights the importance of information, dissemination and implementation of prevention and health promotion protocols aimed at this topic, in addition to scientific evidence and especially emerging human training in health, so that the reliability of the health professional increases, and, consequently, the results of your activity become more effective, mitigating workplace accidents<sup>22</sup>.

### ***Physical risks***

It is important to highlight that physical risk can cause internal and external bodily harm to the health of the professional. Literature has been promoting scientific evidence as a strong ally for prevention and its importance in preventing injuries. It is evident how essential it is that nurses have learned about the topic, as they are highly susceptible to these risks<sup>21-23</sup>.

Physical risks may be associated with noise, vibration, insufficient or inadequate lighting, radiation and extreme temperatures<sup>24</sup>. They are directly related to ergonomic risks, as the physical overload that is necessary to carry out procedures such as the weight of stretchers and handling patients and changing positions generate a routine activity that requires physical

effort, which can cause numerous health problems, among them, musculoskeletal disorders, such as pain and injuries in the spine, upper and lower limbs, absence from work and incapacity, resulting in impartiality or even permanent incapacity for the worker<sup>25</sup>.

### ***Ergonomical risks***

The illness of healthcare professionals who provide care in Mobile Care Services, due to ergonomic risks, is often reported as causing injuries and illness; The professional's posture has considerably influenced the risk, as it generates conditions of exposure to injury risks such as musculoskeletal injuries<sup>26</sup>.

The presence of musculoskeletal diseases is recurrent in professionals who deal with heavy loads, in addition to the intellectual exhaustion associated with biomechanical effort, which causes an increase in mental load. Health professionals who work at SAMU experience this exhaustion more frequently, and this is linked to the morning period, as it is a time when there is an increase in the number of occurrences, configuring itself as the moment susceptible to a greater occurrence. number of musculoskeletal injuries and psychosomatic disorders<sup>27</sup>.

The effect of ergonomic risk has been described due to the length of time that nursing professionals sit inside ambulances, which is a frequent routine between calls for assistance and the need for quick muscular responses when called in<sup>23,28</sup>.

### ***Psychosocial risks***

Psychosocial risks can be directly related to psychological risks in the work environment, resulting from stress and pressure exerted. Professionals need a solid, healthy and quality work environment, as the environment has the potential to develop psychological and physiological disorders and directly impact the worker's health and performance of their role<sup>29</sup>.

In addition to physical risks, psychological risks in nursing professionals are increasingly common in the workplace. A study shows that it has been identified that this category suffers the implications of precarious work and mainly in relation to mental health, with complaints identified such as: depression, crying, feelings of guilt, sadness, loss of concentration, insomnia, stress, worry, impotence and irritability<sup>30</sup>.

In undergraduate Nursing there is a gap regarding topics related to occupational risks, which usually require investment in a postgraduate/specialization course, for better training and care provision<sup>31</sup>.



### ***Measures and strategies to combat occupational risks***

Identifying and monitoring risk factors contributes to and makes it possible to recognize and investigate risks, potentially reducing the incidence of work accidents, with a view to promoting and protecting health and recovering and/or rehabilitating health professionals who are exposed to risk in the workplace<sup>32</sup>.

To guarantee the safety and health of workers in the work environment, it is necessary to ensure that the process is carried out in a safer way, through the transformation of the work environment and any process that is qualified as dangerous, since this means that the solution consists of eliminate risks, and not try to make healthcare professionals adapt to dangerous conditions<sup>33</sup>.

According to the Portugal Safety Manual for the DGR Worker<sup>23</sup>, safety and health at work consist of a daily discipline with a broad scope, which involves many areas of specialization, which seek to: prevent adverse effects on safety and health arising from working conditions; and the protection of workers in their employment from risks resulting from situations that may harm the safety and health of workers.

### ***Use of PPE***

In a survey carried out in the Recôncavo Baiano region in a Mobile Emergency Service Unit, which has a total of 75,000 inhabitants covered by the service, it was observed that all SAMU health professionals have free access to PPE such as gloves, masks, clothing protective gear, boots, glasses. However, non-adherence to PPE is due to the interference of this equipment in procedures. As a result, some professionals only use gloves and masks, which leaves them vulnerable to occupational risks such as spilling of bodily fluids on the skin and mucous membranes<sup>34</sup>.

In SAMU, the use of PPE such as procedural gloves, surgical-type masks, protective glasses, rubber boots and uniforms (overalls) are mandatory for professionals who work in ambulances<sup>33</sup>.

## **CONCLUSION**

This study aimed to analyze the occupational risks faced by the nursing team that works in the Mobile Emergency Care Service and what containment measures are implemented. From this, the analysis of the studies allowed us to verify that work accidents, in particular occupational risks, were statistically significant for professionals who provide health care at SAMU, mainly nurses.

Several prevalent risks were identified, including: Unhealthy environments, Work as a motivating factor for illness, Nursing team work in emergency services versus occupational risks, Risks inherent to work in emergency services, Biological risks, Physical risk, Ergonomic risk, Psychosocial risks, Measures and strategies to combat occupational risks and Use of PPE.

In this scenario, it can be concluded that the Nursing category is exposed to various occupational risks, revealing that the characteristics of the work environment can favor the occurrence of risks, generating psychological and physiological disorders, causing damage to health by producing changes in the body, emotional state, compromising productivity.

When analyzing the data, it is understood that some factors are essential to avoid risks such as the availability of PPE (the lack of which makes the environment unhealthy), work overload and lack of recognition of the category, causing work to be encouraged as a motivating factor for illness, and ongoing health education, as an ongoing policy to avoid contamination by biological risks due to lack of knowledge and/or awareness among professionals, as well as professional psychological support to reduce psychological risks.

However, even with the contributions that this study brings to science, academia and society and particularly to nursing in Mobile Emergency Care, this study has limitations due to its methodology, since it has a design that analyzes documents, that is, data secondary.

Based on this study, it is suggested that further research be carried out with longitudinal studies and randomized clinical trials, due to the magnitude that this theme addresses, in the promotion and prevention of worker health, so that it can also contribute to permanent education policies in health, so that there are changes in the working environment of Mobile Emergency Service Care.

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**Denize Vieira dos Santos, Josivan Soares Alves Júnior, Samara Farias Aragão** contributed to the design, collection and analysis of data. **Joyce Kell Sampaio da Silva, Débora Regina Alves Raposo, Lohanny Ingridh Moura Valle** participated in the design, data analysis, writing and revision.

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