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**Original Article**

# Occupational stress and musculoskeletal symptoms in Community Health Workers[1]

## *Estresse ocupacional e sintomas osteomusculares em Agentes Comunitários de Saúde*

Eduardo Henrique Tadashi Suyama[a], Luciano Garcia Lourenção[b], Dezolina Franciele Cardin Cordioli[a], João Roberto Cordioli Junior[a], Maria Cristina Oliveira Santos Miyazaki[a]

[a]Faculdade de Medicina de São José do Rio Preto – FAMERP, São José do Rio Preto, SP, Brasil.
[b]Universidade Federal do Rio Grande – FURG, Rio Grande, RS, Brasil.

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## Abstract

**Introduction:** Community health workers (CHWs) work under conditions of occupational risks and overload that can cause illness. **Objectives:** To evaluate the presence of occupational stress and musculoskeletal symptoms in community health workers, and compare the levels of occupational stress, according to sociodemographic characteristics. **Method:** Cross-sectional study, conducted in 2017, in a municipality in the interior of São Paulo state. The Work Stress Scale and the Nordic Musculoskeletal Questionnaire were used. **Results:** Forty-four CHWs participated, 70.5% were female, 47.7% were 40 years old or older, 79.5% had no other paid activity and 50.0% had three to 10 years of professional experience. Twenty-one (47.7%) professionals presented important levels of occupational stress (>2.5). The main stressors were: deficiency in disclosure of information about organizational decisions (3.3;±1.1); deficiency in training (3.4;±1.6); little appreciation (3.2;±1.4); few prospects for career growth (3.2;±1.6); discrimination/favoritism in the work environment (3.1;±1.5); lack of understanding about job responsibilities (3.0; ±1.5); type of control (2.9;±1.1); how tasks are distributed (2.8;±1.4); performing tasks that are beyond one's capacity (2.8;±1.2); lack of autonomy in performing the work (2.7;±1.3); receiving contradictory orders from the superior (2.7;±1.4); insufficient time to perform the work (2.7;±1.3). In the last year, 65.9% of CHWs reported musculoskeletal pain

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in the lower back, 61.4% in the neck, 47.7% in the shoulders, and 43.2% in the knees. **Conclusion:** Occupational stress and musculoskeletal symptoms are problems present in the CHWs' work practice, showing that organizations need to increase labor resources to prevent psychosocial risks and enhance the quality of work of these professionals.

**Keywords:** Primary Health Care, Community Health Workers, Occupational Health, Cumulative Trauma Disorders.

***Resumo***

**Introdução:** Os Agentes Comunitários de Saúde (ACS) trabalham em condições de riscos ocupacionais e sobrecarga que podem causar adoecimento. **Objetivos:** Avaliar a presença de estresse ocupacional e sintomas osteomusculares em Agentes Comunitários de Saúde e comparar os níveis de estresse ocupacional, segundo as características sociodemográficas. **Método:** Estudo transversal, realizado em 2017, em um município do interior paulista. Foram utilizadas a Escala de Estresse no Trabalho e o Questionário Nórdico de Sintomas Osteomusculares. **Resultados:** Participaram 44 ACS, sendo 70,5% do sexo feminino, 47,7% com 40 anos ou mais, 79,5% não exerciam outra atividade remunerada e 50,0% tinham de três a 10 anos de atuação profissional. Vinte e um (47,7%) profissionais apresentaram níveis importantes de estresse ocupacional (>2,5). Os principais fatores estressores foram: deficiência na divulgação de informações sobre decisões organizacionais (3,3;±1,1); deficiência nos treinamentos (3,4;±1,6); pouca valorização (3,2;±1,4); poucas perspectivas de crescimento na carreira (3,2;±1,6); discriminação/favoritismo no ambiente de trabalho (3,1;±1,5); falta de compreensão sobre as responsabilidades no trabalho (3,0;±1,5); tipo de controle (2,9;±1,1); forma como as tarefas são distribuídas (2,8;±1,4); realizar tarefas que estão além da capacidade (2,8;±1,2); falta de autonomia na execução do trabalho (2,7;±1,3); receber ordens contraditórias do superior (2,7;±1,4); tempo insuficiente para realizar o trabalho (2,7;±1,3). No último ano, 65,9% dos ACS referiram dor osteomuscular nas regiões lombar, 61,4% no pescoço, 47,7% nos ombros e 43,2% nos joelhos. **Conclusão:** O estresse ocupacional e os sintomas osteomusculares são problemas presentes na prática laboral dos ACS, evidenciando que as organizações precisam incrementar recursos laborais para prevenir riscos psicossociais e amplificar a qualidade do trabalho destes profissionais.

**Palavras-chave:** Atenção Primária à Saúde, Agentes Comunitários de Saúde, Saúde do Trabalhador, Transtornos Traumáticos Cumulativos.

## Introduction

The Unified Health System (*Sistema Único de Saúde* - SUS) is one of the largest public health systems in the world, achieving large proportions of goals through the Family Health Strategy (FHS), a priority model for Primary Health Care (PHC), implemented in Brazil in the 1990s. The ESF was created to reorganize primary care services and strengthen the principles of the SUS, ensuring the well-being of people, based on the expansion of health promotion and disease prevention actions carried out.

integrally and continuously, replacing the biomedical model (Pinto & Giovanella, 2018).

The health team of the ESF consists of at least nursing assistant(s)/technician, nurse, physician, and community health workers (CHW). As they live in the community, the CHW is considered a fundamental link between the team and the population, favoring the work of surveillance and health promotion (Lourenção et al., 2012; Brasil, 2017; Vidal et al., 2015).

According to the National Policy on Primary Care (*Política Nacional de Atenção Básica* - PNAB), the CHW's attributions are: to register users in their area of expertise, to update data periodically; to assist in the demographic, sociocultural, epidemiological, environmental, and health diagnosis of the territory in which they operate; to carry out regular home visits, developing actions to promote health and prevent diseases and injuries individually and together with other team professionals; to assist in the identification of suspected cases of endemic diseases and health problems, guiding the user to seek adequate care; to identify suspected cases of diseases and injuries, refer users to the reference health unit, register and communicate the fact to the health authority responsible for the territory; to encourage the participation of the population in social control actions, among others (Brasil, 2017).

Commonly, the CHWs are the first professionals to listen to the complaints and demands of users, becoming a reference and facilitator of access to other professionals and health services. Also, they are the target of great expectations from the community and other professionals of the FHS team and may experience situations of intense stress, such as high work demand, lack of knowledge about how to approach the family(s), direct and immediate contact with situations of precarious life, which determine health conditions, and even positioning in the face of social inequality and the pursuit of citizenship (Almeida, 2015; Lourenção et al., 2012; Nascimento et al., 2017; Peres et al., 2011).

Conceptually, stress is the body's response to dangerous situations that, when they become constant, lead to pathogenic effects. In this context, occupational stress brings disorders and illnesses related to work practice and implies reduced productivity and increased absenteeism, causing damage to the worker, the manager/employer, and users of the health system (Reis & Malcher, 2017).

In the case of CHWs, work activities are often carried out in conditions of occupational risks, such as contact with dust, exposure to moisture and solar radiation, exposure to pathogens, urban violence, and work overload, which can cause physical and mental illness (Mesquita et al., 2019). Furthermore, the fact that health units are often inserted in dangerous and unhealthy environments has social inequalities and poverty, favoring the risk of psychological distress in the CHW (Carreiro et al., 2013; Moreira et al., 2016). This was evidenced in a study carried out in the municipality of Ananindeua, Pará, identifying 90% of CHWs with moderate to intense levels of stress, presenting signs and symptoms such as muscle pain, fatigue, and indigestion (Reis & Malcher, 2017).

Another study, carried out with FHS professionals in the interior of the state of São Paulo, pointed out the presence of relevant occupational stress among workers and showed that the deficit in training, the lack of prospects for professional growth, the low value of superiors and insufficient time to perform the work are some of the factors considered the most stressful in PHC services (Cordioli et al., 2019).

Thus, by aiming to promote community health through disease prevention, through collective work that presupposes interpersonal relationships between the team and the community, the FHS professionals (including the CHW) are exposed to psychosocial stressors (Cordioli Junior et al., 2020; Gomes et al., 2015; Martins et al., 2014).

In addition, the inadequate or strenuous work process, associated with emotional exhaustion, can lead to musculoskeletal morbidities, with the presence of symptoms without a specific clinical entity and aspects related to pain, fatigue, loss of strength and range of motion, and paresthesia (Santos et al., 2016). In the case of CHW, some of the risk factors for the development of musculoskeletal pain are the need to walk long distances to carry out home visits, standing up for several hours throughout the week; prolonged exposure to the sun; the weight resulting from the medical records and forms carried in backpacks, under the shoulders or on the back; and the use of inappropriate shoes (Baptistini & Figueiredo, 2014; Faria et al., 2021; Santos et al., 2015).

Musculoskeletal morbidities include affections of muscles and tendons, nerves and ligaments, synovia (joint linings), and fascia (muscle envelope), with or without tissue degeneration. In general, they are characterized by symptoms such as pain, paresthesia, the feeling of heaviness, and fatigue. As they are common, these morbidities represent an important problem to the health of workers, which can cause work incapacity and compromise the quality of life of health professionals, impairing assistance to FHS users (Davis & Kotowski, 2015; Lourenção et al., 2017; Portela & Ross, 2015).

In this context, this study aimed to evaluate the presence of occupational stress and musculoskeletal symptoms in community health workers, and also to compare the levels of occupational stress, according to sociodemographic characteristics.

## Method

This is a cross-sectional study carried out in 2017 with a non-probabilistic convenience sample, which included community health workers and control agents of endemic diseases from a small town in the interior of São Paulo.

The municipality is located in the Nova Alta Paulista region, 596 km from the capital of the State of São Paulo. In 2017, it had an estimated population of 35,137 inhabitants, demographic density of 82.15 inhabitants per square kilometer, GDP per capita of R$30,010.56, infant mortality of 11.63 deaths per 1,000 live births, and 95.8% of sewage adequate. In 2010, the municipality's HDI was 0.790 (Instituto Brasileiro de Geografia e Estatística, 2020). The municipality is a reference center in the health area for nine municipalities in the Nova Alta Paulista region. In structuring the local health model, the Municipal System has seven Primary Health Care units, with 10 FHS teams, assisting an urban and rural population of 33,797 and 1,849 people, respectively, with 100% coverage by the FHS.

The study population consisted of 64 professionals, 44 community health agents, and 20 endemic control agents from the seven Primary Health Care Units in the city. Although they have different positions, both professionals work as Community Health Workers in the municipality's Family Health Units and, therefore, they perform the same function. Since their insertion in the units, Endemic Control Agents have been allocated in the role of CHW, with the same work dynamics in both categories. We

excluded professionals who were on vacation during the period of data collection and/or away from professional activities for any other reason.

For data collection, we used three self-administered instruments: one with sociodemographic and professional questions; the Work Stress Scale (WSS), validated by Tamayo & Paschoal (2004); and the Nordic Musculoskeletal Symptoms Questionnaire (NMSQ), translated, adapted, and validated in Brazil (Pinheiro et al., 2002).

The WSS is composed of 23 negative statements, with a 5-point scale, ranging from "1 - totally disagree" to "5 - totally agree". The scale provides a general measure of stress, whose items address various stressors and emotional reactions that are constantly associated with them. The WSS is not a psychological test but an organizational diagnostic tool that has been subjected to psychometric testing and requirements (Tamayo & Paschoal, 2004). WSS indicators range from 1 to 5, and the higher the average, the greater the stress. Indicators of important levels of stress are considered to be mean values equal to or greater than 2.5.

The NMSQ assesses pain symptoms in the neck, shoulder, elbow, forearm, wrist/hand/finger, back, lower back, hip/thigh, knee, ankle/foot, in the last seven days and the last 12 months. This instrument was developed to standardize the measurement of reported musculoskeletal symptoms and facilitate the comparison between studies, allowing the assessment of musculoskeletal morbidity symptoms and their relationship with demographic, occupational, and personal habits variables (Kuorinka et al., 1987; Pinheiro et al., 2002).

Data collection was scheduled with the nurses of the health units and carried out during the team meeting. After the explanation of the study objectives by the researchers, the signatures of the Informed Consent Term were collected from the workers who consented to participate in the study. Then, we gave the questionnaires to all workers who responded and deposited them in a manila envelope, without identification, to preserve the identity of the respondents. As there were workers who did not want to answer the questionnaires at that time, the researchers scheduled a date to return and receive the answered instruments (approximately, after one week).

We used the Statistical Package for Social Sciences (SPSS), version 20.0 to analyze data. Sociodemographic variables were descriptively analyzed and used to characterize the study population. Occupational stress was assessed by calculating an overall average score and an average score for each item on the scale, identifying the most frequent stressors, according to the workers' perception. The assessment of symptoms of musculoskeletal disorders was calculated by the frequency of complaints presented by professionals in the last seven days and the last 12 months. The comparison of occupational stress levels, according to sociodemographic characteristics, was performed using the t-test for two variables or analysis of variance (ANOVA) for three or more variables, considering significant p-values$\leq$0.05.

The study was approved by the Research Ethics Committee of the institution, under Opinion number 1.890.199, of January 11, 2017.

## Results

We had 44 professionals participating in the study, in which 31 (70.4%) were female, 21 (47.7%) were 40 years old or more, 18 (40.9%) had high school, 22 (50.0%) were single, 33 (75.0%) had a family income of two to five minimum wages, 35 (79.5%) had no other paid activity, 37 (84.1%) slept for six to eight hours a day, and 22 (50.0%) had three to 10 years of experience in primary health care (Table 1).

**Table 1.** Sociodemographic characteristics of Community Health Workers and Endemic Control Agents (n=44).

| Variables | n | % |
|---|---|---|
| **Gender** | | |
| Male | 12 | 27.3 |
| Female | 31 | 70.4 |
| No answer | 01 | 2.3 |
| **Age group** | | |
| From 18 to 28 years old | 5 | 11.4 |
| From 29 to 39 years old | 13 | 29.5 |
| From 40 years old or more | 21 | 47.7 |
| No answer | 5 | 11.4 |
| **Education level** | | |
| High school | 18 | 40.9 |
| Incomplete Higher Education | 16 | 36.4 |
| Graduation | 9 | 20.4 |
| No answer | 1 | 2.3 |
| **Marital status** | | |
| Married | 21 | 47.7 |
| Single | 22 | 50.0 |
| Separated | 1 | 2.3 |
| **Family income*** | | |
| Up to 1 Minimum Wage | 8 | 18.2 |
| From 2 to 5 Minimum Wage | 33 | 75.0 |
| From 6 to 10 Minimum Wage | 3 | 6.8 |
| **Othe Paid Activities** | | |
| Yes | 9 | 20.5 |
| No | 35 | 79.5 |
| **Daily hours of sleep** | | |
| Less than 6 hours | 7 | 15.9 |
| From 6 to 8 hours | 37 | 84.1 |
| **Time Acting at PHC** | | |
| Up to 2 years | 15 | 34.1 |
| From 3 to 10 years | 22 | 50.0 |
| More than 10 years | 6 | 13.6 |
| No answer | 1 | 2.3 |

* Minimum Wage for the Study Period: R$937,00.

Regarding occupational stress, 21 (47.7%) professionals had significant levels of occupational stress (>2.5). Table 2 shows the factors considered as stressors in the perception of CHWs and Endemic Control Agents. They were: [Q5] deficiency in disclosing information about organizational decisions (3.3; ±1.1); [Q13] deficiency in

training for a professional qualification (3.4; ±1.6); [Q15] little appreciation by superiors (3.2; ±1.4); [Q16] few career growth prospects (3.2; ±1.6); [Q12] discrimination/favoritism in the work environment (3.1; ±1.5); [Q19] lack of understanding about job responsibilities (3.0; ±1.5); [Q2] type of existing control (2.9; ±1.1); [Q1] how tasks are distributed (2.8; ±1.4); [Q9] perform tasks that are beyond capacity (2.8; ±1.2); [Q3] lack of autonomy in performing the work (2.7; ±1.3); [Q20] receive contradictory orders from the superior (2.7; ±1.4); [Q22] the insufficient time to perform the work (2.7; ±1.3); [Q6] lack of information about tasks at work (2.6; ±1.2).

**Table 2.** Evaluation of WSS items, according to the perception of CHWs and Endemic Control Agents (n=44).

| WSS items | Mean (±SD) |
|---|---|
| **Q1 -** The way tasks are distributed in my area has made me nervous | **2.8 (±1.4)** |
| **Q2 -** The kind of control that exists in my work annoys me. | **2.9 (±1.1)** |
| **Q3 -** The lack of autonomy in the execution of my work has been exhausting. | **2.7 (±1.3)** |
| **Q4 -** I have been uncomfortable with my superior's lack of confidence in my work. | 2.4 (±1.3) |
| **Q5 -** I am irritated by the lack of disclosure of information about organizational decisions. | **3.3 (±1.1)** |
| **Q6 -** I feel uncomfortable with the lack of information about my tasks at work. | **2.6 (±1.2)** |
| **Q7 -** The lack of communication between me and my co-workers makes me angry. | 2.1 (±1.4) |
| **Q8 -** I feel annoyed that my superior treats me badly in front of co-workers | 1.8 (±1.1) |
| **Q9 -** I feel uncomfortable having to perform tasks that are beyond my capacity | **2.8 (±1.2)** |
| **Q10 -** I get in a bad mood for having to work for many hours at a time | 2.1 (±1.2) |
| **Q11 -** I feel uncomfortable with the communication between me and my superior | 2.0 (±1.2) |
| **Q12 -** I get irritated by discrimination/favoritism in my work environment. | **3.1 (±1.5)** |
| **Q13 -** I have been uncomfortable with the deficiency in training for professional training. | **3.4 (±1.6)** |
| **Q14 -** I get in a bad mood because I feel isolated in the organization. | 2.0 (±1.1) |
| **Q15 -** I get annoyed at being undervalued by my superiors | **3.2 (±1.4)** |
| **Q16 -** The few prospects for career growth have left me anguished | **3.2 (±1.6)** |
| **Q17 -** I have been uncomfortable working on tasks below my skill level. | 2.3 (±1.4) |
| **Q18 -** The competition in my work environment has put me in a bad mood. | 2.3 (±1.1) |
| **Q19 -** The lack of understanding of what my responsibilities are in this work upsets me. | **3.0 (±1.5)** |
| **Q20 -** I've been nervous about my superior giving me contradictory orders | **2.7 (±1.4)** |
| **Q21 -** I feel irritated that my superior is covering up my job well done in front of other people. | 2.1 (±1.3) |
| **Q22 -** Insufficient time to carry out my workload makes me nervous | **2.7 (±1.3)** |
| **Q23 -** It bothers me that my superior avoids taking on important responsibilities. | 1.8 (±1.1) |

SD: standard deviation.

Professionals who do not have another paid job had a significantly higher level of occupational stress than those who have another paid job (p=0.041) (Figure 1). There was no statistically significant difference in the occupational stress levels of CHWs and Endemic Control Agents, according to gender (p=0.409), age group (p=0.402), education level (p=0.142), marital status (p=0.445), family income (p=0.405), daily hours of sleep (p=0.540) and length of experience in PHC (p=0.634).

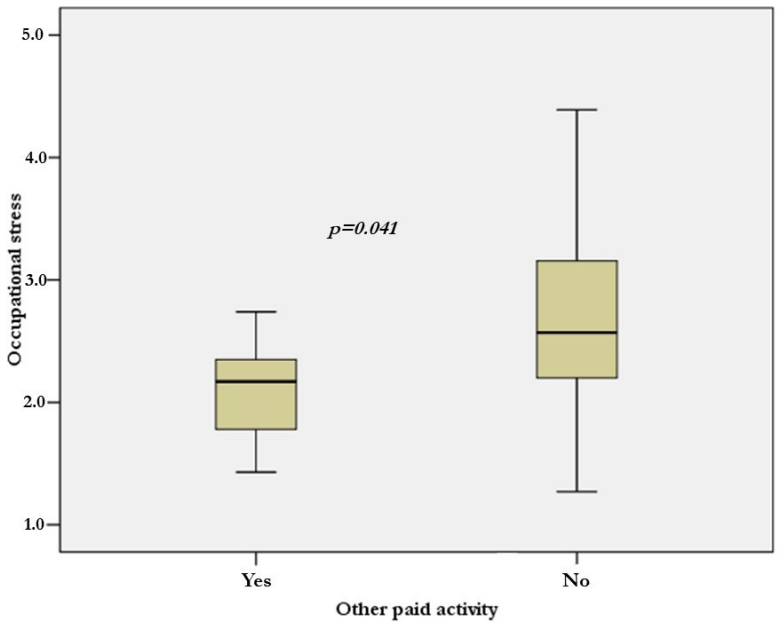


**Figure 1.** Occupational stress levels of Community Health Workers and Endemic Control Agents, according to other paid activity.

Figure 2 shows that there was an important percentage of CHWs and Endemic Control Agents with complaints of musculoskeletal pain. The main regions mentioned by the professionals were the lower back, neck, shoulders, wrists/hands/fingers, and knees, ankles, and feet.

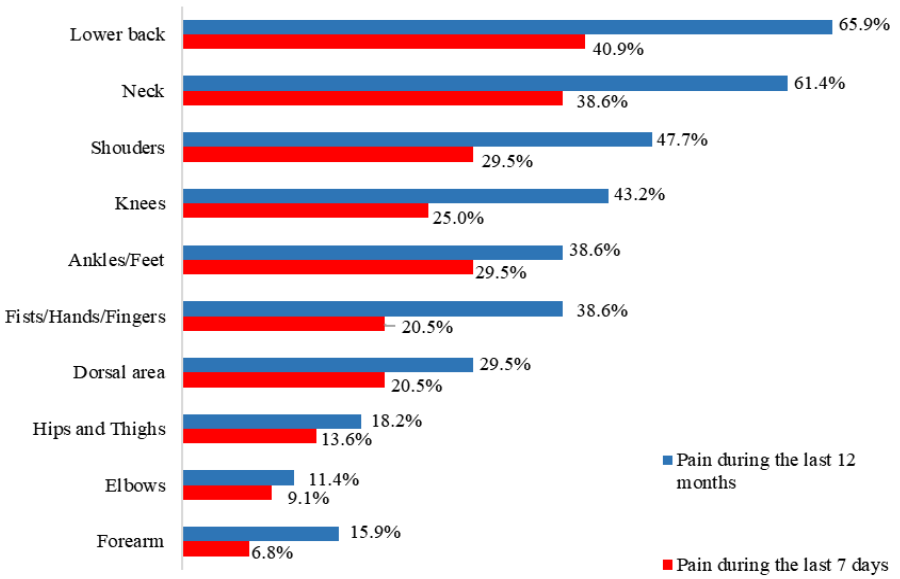


**Figure 2.** Distribution of musculoskeletal symptoms reported by Community Health Workers and Endemic Control Agents.

## Discussion

The sociodemographic profile of community health workers is similar to other studies with these professionals. There is a predominance of middle-aged single women with high school education. This prominence of women in the CHW profession reinforces the growing process of feminization that has been taking place in the health area in recent decades (Almeida et al., 2016; Hoppe et al., 2017; Krug et al., 2017).

The percentage of professionals who presented scores compatible with occupational stress is higher than other national studies, with PHC professionals. They show that the high psychological demands of the CHW´s work, such as responsibility for the health of users, have a high demand for information, criticism, and verbal aggression, in addition to a lack of appreciation and recognition, can lead to wear and tear and illness (Almeida et al., 2016; Cordioli et al., 2019). Also, the predominance of female professionals can be a factor that contributes to increased stress in the work environment, as women need to reconcile work with family demands (Reis et al., 2020). This double shift harms their energy recovery due to the reduction of hours of sleep, rest, and leisure, which may be responsible for increasing stress (Sousa & Guedes, 2016).

The higher level of stress of CHWs who do not have another paid activity may be related to the full involvement with the demands of the community. While professionals who go out to work manage to disconnect, for some time, from the environment and problems received from the community, those who have no other relationship end up being available at all times to assist the community, listen to complaints, find problems, and seek solutions, that is, they are more exposed to the emotional strain that comes from their work practice. In this context, although the development of another paid activity is seen as a negative aspect, the change in the work environment can reduce the level of stress and, despite physical wear and tear resulting from the accumulation of workload, it becomes a positive factor for the psycho-emotional health of these professionals (Simas & Pinto, 2017).

The aspects identified as stressful by the CHWs also corroborate other studies with PHC professionals and reinforce the multifactorial nature of stress. This stress can be influenced by the workloads to which workers are submitted, in addition to aspects related to the organization of the process of work, such as the deficiency in the dissemination of information, lack of training, favoritism in the work environment, and way of distributing tasks (Castro et al., 2019; Cordioli et al., 2019). These workloads interact with the worker's body, which can generate wear and compromise the body and mental capacity (Santos et al., 2019).

In this context, studies show that PHC professionals, especially CHWs, work under intense physical, cognitive, and psychological loads, resulting from the inadequate physical structure, precariousness of resources to perform tasks, exposure to physical, chemical, biological, and ergonomic risks, which can cause physical exhaustion and psychological distress, reinforcing the multifactorial nature of occupational risks present in the professional practice of the CHWs (Cordioli et al., 2019; Lopes et al., 2018). According to a study carried out in medium and small cities in Minas Gerais, most CHWs were emotionally exhausted, and part of this exhaustion was related to prolonged exposure to work-related stressors, corroborating the results of our study (Silva et al., 2017).

In addition to stress, the work process can interfere with the physical condition of workers, causing musculoskeletal pain, as shown by the results of this study. Therefore, the predominance of pain in the lower back, neck, shoulders, wrists/hands/fingers, and knees, ankles, and feet showed by the CHWs corroborates what has been reported by other studies with PHC professionals and reinforces that the CHW's work process is exhausting (Castro et al., 2019; Cordioli et al., 2019; Paula et al., 2015).

The pain was the main symptom of musculoskeletal disorders and its origins can be different, according to the characteristics of the work. In the case of CHWs, the biomechanical conditions of the professionals, weight lifting, maintenance in prolonged postures, and undue efforts must be observed. The pain in the neck and shoulders reported by these professionals, for example, may be related to repetitive movements of the upper limbs or postures performed in a static contraction. In addition, emotional issues including occupational stress are described as pain worsening or triggering factors (Barbosa et al., 2012; Henríquez et al., 2010).

## Conclusions

The study showed that there is a relevant number of CHWs with significant occupational stress. The main stressing aspects pointed out by professionals refer to the lack of training and deficiency in the dissemination of information about organizational decisions, low valuation and lack of career growth prospects, discrimination/favoritism in the work environment, lack of understanding of responsibilities, type of control and the way tasks are distributed, lack of autonomy and ability to carry out work activities, receiving contradictory orders from superiors, lack of time and information to comply with all work activities. The main body regions with pain reported by the CHWs were the lower back, neck, shoulders, wrists/hands/fingers, and knees, ankles, and feet. Therefore, the work process in the PHC teams, in the municipality understudy, is exhausting and causes physical and mental illness for the CHWs.

These results show that organizations need to understand health as a strategic value and increase labor resources to prevent psychosocial risks and amplify the quality of work of CHWs, directing actions to promote and protect the health of these workers, such as reorganizing the work process, listening techniques and stress management and moments of reflection and support for workers, seeking to reduce suffering and damage that could compromise the physical and emotional health of these professionals.

The study was carried out in a single municipality representing a limitation, as it does not allow the generalization of the results. Thus, we recommend carrying out further studies, which include professionals from cities in different regions of Brazil for a broader and deeper analysis of this topic.

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Luciano Garcia Lourenção: He contributed to the project design, analysis, and interpretation of data and writing of the article. Maria Cristina Oliveira Santos Miyazaki: She contributed to the relevant critical review of the intellectual content and final approval of the version to be published. Eduardo Henrique Tadashi Suyama, Dezolina Franciele Cardin Cordioli, and João Roberto Cordioli Junior: They contributed to the collection, analysis, and interpretation of data and writing of the article. All authors approved the final version of the text.

**Corresponding author**

Luciano Garcia Lourenção
e-mail: lucianolourencao.enf@gmail.com

**Section editor**

Prof. Dr. Iza Faria-Fortini