Occupational stress and common mental disorders: how do coping strategies work?

Estresse ocupacional e transtornos mentais comuns: como atuam as estratégias de enfrentamento?

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ABSTRACT | Introduction: Coping strategies are described as devices capable of minimizing the effects of occupational stress on workers’ mental health. Objectives: To evaluate the association between occupational stressors and occurrence of common mental disorders and how coping strategies work in this relationship. Methods: This is a cross-sectional study with 3,343 healthcare workers from six municipalities in the state of Bahia, Brazil. Common mental disorders were measured by the Self-Reporting Questionnaire, and occupational stressors by the Job Content Questionnaire. Coping strategies included physical activity, leisure activities, social support at work, alcohol consumption, and smoking. Bivariate and multivariate analyses were performed, stratified by sex. Results: Occupational stressors were associated with common mental disorders, more strongly among women. The practice of physical activity contributed to reduce the prevalence of common mental disorders, regardless of occupational stressors. Leisure activities were associated with lower prevalence of common mental disorders, but without statistical significance, losing relevance in the presence of occupational stressors. Social support and smoking or drinking habits were not associated with common mental disorders and did not influence the relationship with occupational stressors. Conclusions: Occupational stressors are associated with common mental disorders, with emphasis on high demand, even after adjusted for coping strategies. The relationship between occupational stressors and mental is corroborated, with greater female vulnerability, as well as the role of positive coping strategies in protecting mental health. The pertinence of adopting measures that reduce stress at work, promote the adoption of positive coping strategies, and consider gender inequalities in these relationships.

Keywords | mental disorders; occupational stress; psychological adaptation; occupational health.

RESUMO | Introdução: As estratégias de enfrentamento são descritas como dispositivos capazes de minimizar os efeitos do estresse ocupacional na saúde mental dos(as) trabalhadores(as). Objetivos: Avaliar associação entre estressores ocupacionais e ocorrência de transtornos mentais comuns e como as estratégias de enfrentamento atuam nessa relação. Métodos: Estudo transversal com 3,343 trabalhadores(as) da saúde de seis municípios baianos. Os transtornos mentais comuns foram mensurados pelo Self-Reporting Questionnaire e os estressores ocupacionais pelo Job Content Questionnaire. As estratégias de enfrentamento incluíram prática de atividade física, lazer, apoio social no trabalho e consumo de álcool e tabaco. Foram processadas análises bivariada e multivariada, estratificadas por sexo. Resultados: Os estressores ocupacionais associam-se aos transtornos mentais comuns, mais fortemente entre as mulheres. A prática de atividade física contribuiu para redução da prevalência de transtornos mentais comuns, independentemente dos estressores ocupacionais. As atividades de lazer associaram-se a menor prevalência de transtornos mentais comuns, porém sem significância estatística, perdendo relevância na presença de estressores ocupacionais. O apoio social e os hábitos de fumar ou beber não se associaram aos transtornos mentais comuns nem influenciaram a relação com estressores ocupacionais. Conclusões: Os estressores ocupacionais associaram-se aos transtornos mentais comuns, com destaque para a alta exigência, mesmo após ajuste pelas estratégias de enfrentamento. Corroborou-se a relação entre estressores ocupacionais e saúde mental, com maior vulnerabilidade feminina, e o papel de estratégias de enfrentamento positivas na proteção da saúde mental. Ressalta-se a pertinência da adoção de medidas que reduzam o estresse no trabalho, promovam a adoção de estratégias de enfrentamento positivas e considere as desigualdades de gênero nessas relações.

Palavras-chave | transtornos mentais; estresse ocupacional; adaptação psicológica; saúde do trabalhador.
INTRODUCTION

Occupational stressors has been a cause of concern in many countries, due to triggers for the development or worsening of common mental disorders (CMD), a growing public health problem. To deal with unfavorable situations at work, the use of coping strategies has been recommended, especially those with potential to minimize the detrimental effects of occupational stress on workers’ mental health.

Occupational stressors correspond to factors that increase work demands and requirements, exceeding the individual's capacity for physiological, psychological, and behavioral responses. Therefore, these stressors interfere with the capacity of coping with demands in the workplace. The production of occupational stressors is thus considered to result from the inter-relationship between workers, their adaptation skills/capacities and responses, and work environments/characteristics.

Occupational stressors directly affect workers' wellbeing. Among the most frequently mentioned, there are the following: work routine, demands, requirement, lack of control, autonomy, and poor working conditions. The literature provides evidence on the relationship between these characteristics and CMD.

The expression “common mental disorders” was created by Goldberg & Huxley to characterize a set of non-psychotic symptoms indicating mental distress, such as insomnia, fatigue, irritability, forgetfulness, difficulty concentrating, and somatic complaints, without a clear diagnostic definition according to diagnostic criteria of international classifications. In general, these disorders present with fluctuating symptoms, which can be reversed to some extent, without belonging to any specific established category.

CMD are highly prevalent psychic disorders worldwide, being related to stressful events, such as reduced social support and poor living and working conditions. Studies show a high prevalence of CMD in healthcare workers. Therefore, occupational stressors deserve special attention among measures aimed at reducing these disorders.

Of the models that seek to assess occupational stressors, the Demand-Control Model (DCM), proposed by Karasek, is one of the most used worldwide. The DCM indicates the two psychosocial dimensions of work: psychological demand (psychological pressures to which workers are subjected, related to amount of work and to the type of task performed in a unit of time) and control over work (related to the use of skills and to autonomy in its performance).

When exposed to psychosocial stressors, individuals tend to develop different ways of coping, which are related to personal factors, situational demands, and available resources. The use of appropriate strategies makes it possible to reduce the impact of stress on people's everyday life and may prevent mental illness.

Coping strategies are processes that connect individual and environmental aspects and are distributed into eight types: problem solving; social support; responsibility acceptance; self-control; positive reappraisal; escape-avoidance; distancing; and confrontation. These strategies also include crying and using alcohol, drugs, tobacco, and medications.

This study focused on coping strategies in the inter-relationship between occupational stressors and mental disorders, according to sex, especially physical activity, leisure activities, social support at work, use of tobacco and alcohol. These strategies seek to maintain wellbeing so as to reduce the detrimental effects of stressful situations, but may both exacerbate and mitigate the effects of stressful events.

The identification of coping strategies, either individual or collective, allows increasing resilience and the capacity to overcome unfavorable or vulnerability situations. Therefore, this study aimed to analyze the association between occupational stressors and occurrence of CMD, assessing how coping strategies work in this relationship.

METHODS

This was a cross-sectional study based on data from a multicenter project that aimed to evaluate working, employment and health conditions of healthcare
workers in six municipalities of the state of Bahia, Brazil.

The study target population consisted of 6,191 professionals working at the primary and medium complexity health services of the selected municipalities. Sample size was calculated considering prevalence of CMD of 42.6% among primary healthcare workers,\(^1\) 95% confidence level, 4% accuracy, with a 20% increment to compensate for possible losses and/or refusals. The sample size was defined at 642 workers. A total of 3,343 workers participated in the study, which increased study power.

Sampling procedures were random, with stratification for geographic area, service complexity level, occupational group, and sex. Based on the lists of workers linked to the health departments of the municipalities’ studies, a draw was made using a list of random numbers. Data collection was conducted using a structured questionnaire, previously tested in a pilot study.

CMD, the outcome variable, were measured by the Self-Reporting Questionnaire (SRQ-20), an instrument containing 20 dichotomous yes-no questions that indicate suspected CMD based on a cutoff point of seven or more positive responses for women and of five or more positive responses for men. The SRQ-20 showed a good performance to assess workers’ mental health in Brazil.\(^1\)

The main exposure variable was occupational stressors, as assessed by the Job Content Questionnaire (JCQ), based on the DCM. The DCM considers four situations of occupational stressors, resulting from the combination of dimensions of psychological demand and control over work. The combination of these dimensions defines different work situations, namely: high-strain job (high psychological demand and low control over work); passive job (low psychological demand and low control over work); active job (high psychological demand and high control over work); and low-strain job (low psychological demand and high control over work).\(^7\)

Exposure to low control and/or to high demand generates a stressful situation. Thus, high demand is defined as the work situation with greater vulnerability and risk for physical and mental health; active and passive jobs, as situations with intermediate exposure; and low demand, as the situation with the lowest exposure to psychosocial stressors at work.\(^7\)

In this study, the covariables, coping strategies, were grouped into positive strategies: physical activity,\(^10,11\) leisure activities,\(^11\) and social support at work;\(^12\) and negative: use of alcohol, and smoking,\(^9\) considering their effects over health and wellbeing. The effect (modification and confounding) of coping strategies on the main association was assessed.

Absolute and relative frequencies were assessed for sample characterization. Bivariate statistics allowed to investigate the unadjusted association between main exposure (occupational stressors) and outcome (CMD), as well as between covariables and CMD, based on prevalence ratio (PR) and 95% confidence interval (95%CI). The Pearson chi-square test allowed evaluating statistical significance, set at a p-value ≤ 0.05.

Data analysis was stratified to evaluate confounding variables or effect modifiers. The Breslow-Day homogeneity test,\(^15\) with a p-value of ≤ 0.05, was used to identify whether coping strategies were effect modifiers. In order to identify confounding variable(s), theoretical support and assessment of variation between unadjusted (PRu) and adjusted PR (PRA), the PRA obtained by the Mantel-Haenszel test.\(^16\) Variables with a variation equal or higher than 20% were considered confounding variables; since none of the covariates investigated met this criterion, theoretical knowledge was used to select confounding variables and adjustment to the final model.

Poison regression with robust variance was used to estimate PRA, 95%CI, and p-values in the multivariate analysis. The final model was obtained based on a statistical significance level of 5%. The goodness-of-fit of the model was assessed using the Hosmer-Lemeshow test\(^17\) and the area under the ROC (receiver operating characteristic) curve.

Since both working conditions and characteristics and frequency of mental illness differed significantly between men and women,\(^19\) all analyses were stratified by gender.

Analysis was conducted using the following statistical software: Statistical Package for Social
Sciences (SPSS), version 24.0, and Data Analysis and Statistical Software (STATA), version 12.0.

The study was approved by the Research Ethics Committee (REC) under the protocol number: 081/2009 (CAE 0086.0.059.000-09).

RESULTS

A total of 3,343 healthcare workers participated in the research. The population was predominantly female (77.8%), was aged up to 39 years (55.6%), self-reported as black or mixed-race (80.9%), had no higher education (71.5%), had no children (69.6%), and had no partner (57.6%). With regard to work-related characteristics, working time at the service was greater than 5 years; more than a half worked on a permanent employment contract (65.5%) and had a total weekly working time of up to 40 hours (77.2%).

Concerning the psychosocial aspects of work, most workers reported low control over their own work and low psychological demand, with predominance of workers in a situation of active job (30.5%). It bears highlighting that 79.7% of workers are exposed to a situation of occupational stress, to a lesser or greater extent. The analysis stratified by sex showed that a greater proportion of women were exposed to low control (60%), whereas most men were exposed to high demand (51.9%) (Table 1).

### Table 1. Distribution (%) of psychosocial aspects of work and coping strategies in healthcare workers, Bahia, 2011-2012

| Psychosocial characteristics of work and coping strategies | Total | Women | Men |
|----------------------------------------------------------|-------|-------|-----|
|                                                          | n     | %     | n   | %    | n   | %    |
| Control                                                  |       |       |     |       |     |       |
| High control                                             | 1,272 | 40.7  | 971 | 400  | 298 | 42.9 |
| Low control                                              | 1,857 | 59.3  | 1,459 | 60.0 | 397 | 57.1 |
| Psychological demand                                     |       |       |     |       |     |       |
| Low demand                                               | 1,665 | 51.0  | 1,315 | 51.8 | 349 | 48.1 |
| High demand                                              | 1,600 | 49.0  | 1,222 | 48.2 | 377 | 51.9 |
| Demand-Control Model                                     |       |       |     |       |     |       |
| Low-strain job                                           | 624   | 20.3  | 496 | 20.8 | 128 | 18.7 |
| Active job                                               | 939   | 30.5  | 460 | 19.3 | 163 | 23.8 |
| Passive job                                              | 624   | 20.3  | 739 | 30.9 | 199 | 29.1 |
| High-strain job                                          | 888   | 28.9  | 693 | 29.0 | 195 | 28.5 |
| Physical activity                                        |       |       |     |       |     |       |
| No                                                       | 1,596 | 55.7  | 1,317 | 60.2 | 277 | 41.2 |
| Yes                                                      | 1,268 | 44.3  | 871 | 39.8 | 395 | 58.8 |
| Leisure activities                                        |       |       |     |       |     |       |
| No                                                       | 565   | 17.0  | 483 | 18.8 | 81  | 11.0 |
| Yes                                                      | 2,749 | 83.0  | 2,090 | 81.2 | 655 | 89.0 |
| Social support                                           |       |       |     |       |     |       |
| High                                                     | 898   | 28.9  | 700 | 28.6 | 198 | 30.2 |
| Low                                                      | 2,211 | 71.1  | 1,750 | 71.4 | 458 | 69.8 |
| Use of alcohol                                           |       |       |     |       |     |       |
| No                                                       | 1,865 | 61.4  | 1,584 | 67.6 | 277 | 40.4 |
| Yes                                                      | 1,170 | 38.6  | 760 | 32.4 | 409 | 59.6 |
| Smoking                                                  |       |       |     |       |     |       |
| Nonsmoker                                                | 2,685 | 82.2  | 2,130 | 83.8 | 552 | 76.7 |
| Smoker/former smoker                                     | 580   | 17.8  | 411 | 16.2 | 168 | 23.3 |
| Common mental disorders                                  |       |       |     |       |     |       |
| No                                                       | 2,537 | 78.3  | 1,946 | 77.2 | 588 | 82.0 |
| Yes                                                      | 704   | 21.7  | 575 | 22.8 | 129 | 18.0 |
Women were slightly more exposed to situations of occupational stress than men. As for the female group, 29% were found in a situation of high strain, and 30.9% had a passive job, whereas, for the male group, this percentage was lower: 28.5% for high-strain and 29.1% passive jobs (Table 1).

Considering the positive coping strategies, 44.3% practiced physical activity, 83% reported performing regular leisure activities, and only 28.9% reported having high social support at work. When these results were stratified by sex, men were found to report a greater proportion of positive strategies: 58.8% of them practiced physical activity, 89% performed leisure activities, and 30.2% had high social support at work; for women, these percentages were 39.8, 81.2, and 28.6%, respectively (Table 1).

With regard to negative coping strategies, the consumption of alcohol was reported by 38.6% of workers, and 17.8% smoked. The stratified analysis showed that a greater proportion of men decided to engage in negative strategies, of which 59.6% used alcohol, and 23.3% smoked; among women, the percentages were lower, 32.4 and 16.2%, respectively (Table 1).

The overall prevalence of CMD was 21.7%, being higher among women (22.8%) than men (18%) (Table 1).

In the bivariate analysis (Table 2), high psychological demand and low control over work were

| Variables | Total | CMD | Women | Men |
|-----------|-------|-----|-------|-----|
|          | n     | p-value | 95%CI | p-value | 95%CI | p-value | 95%CI |
| Demand   |       |       |       |       |       |
| High     | 416   | 26.7  | 1.58  | 1.38-1.81 | 28.2 | 1.60 | 1.38-1.86 | 21.8 | 1.57 | 1.13-2.18 |
| Low      | 273   | 16.9  | *     | 176 | * | 13.9 | * |
| Control  |       |       |       |       |       |
| High     | 239   | 19.3  | *     | 19.8 | * | 175 | * |
| Low      | 429   | 23.7  | 1.23  | 1.07-1.41 | 250 | 1.26 | 1.08-1.47 | 18.9 | 1.08 | 0.78-1.49 |
| Demand-Control Model | | | | |
| Low-strain job | 90 | 14.7 | * | 14.7 | * | 14.4 | * |
| Active job | 144 | 23.8 | 1.62 | 1.28-2.06 | 25.2 | 1.71 | 1.31-2.23 | 20.0 | 1.39 | 0.82-2.35 |
| Passive job | 165 | 18.0 | 1.23 | 0.97-1.55 | 19.4 | 1.32 | 1.01-1.71 | 13.0 | 0.89 | 0.51-1.58 |
| High-strain job | 255 | 29.4 | 2.00 | 161-249 | 30.7 | 2.08 | 163-265 | 24.7 | 1.72 | 105-282 |
| Physical activity | | | | |
| Yes      | 186   | 15.1  | 0.64  | 0.54-0.75 | 15.9 | 0.66 | 0.55-0.79 | 13.2 | 0.59 | 0.43-0.84 |
| No       | 365   | 23.7  | *     | 240 | * | 221 | * |
| Leisure activities | | | | |
| Yes      | 522   | 19.5  | 0.59  | 0.51-0.68 | 20.3 | 0.59 | 0.51-0.69 | 16.9 | 0.61 | 0.41-0.92 |
| No       | 178   | 33.0  | *     | 33.8 | * | 276 | * |
| Social support | | | | |
| High     | 181   | 20.8  | 0.93  | 0.79-1.08 | 20.6 | 0.87 | 0.74-1.04 | 21.5 | 1.18 | 0.85-1.64 |
| Low      | 482   | 22.4  | *     | 23.5 | * | 18.2 | * |
| Use of alcohol | | | | |
| No       | 396   | 21.8  | *     | 229 | * | 15.3 | * |
| Yes      | 229   | 20.0  | 0.92  | 0.79-1.25 | 20.4 | 0.88 | 0.75-1.05 | 19.3 | 1.26 | 0.89-1.78 |
| Smoking  | | | | |
| Non-smoker | 563 | 21.5 | * | 22.4 | * | 178 | * |
| Smoker/former smoker | 127 | 22.8 | 1.06 | 0.89-1.26 | 241 | 1.09 | 0.90-1.32 | 19.8 | 1.11 | 0.77-1.59 |

95%CI = 95% confidence interval; PR = prevalence ratio.
* Reference category

Table 2. Association between common mental disorders (CMD), psychosocial aspects of work, and coping strategies, according to sex, in healthcare workers, Bahia, 2012
associated with CMD in the general population, among women, and among men. An association was observed between occupational stress and CMD. Among women, this association was observed for all dimensions of the DCM (active job – PR: 1.71; 95%CI 1.31-2.23; passive job – PR: 1.32; 95%CI 1.01-1.71; and high demand – PR: 2.08; 95%CI 1.63-2.65), compared to low demand. Among men, high demand was the only dimension associated with CMD (PR: 1.72; 95%CI 1.05-2.82) in a statistically significant level.

Positive coping strategies were able to significantly reduce the occurrence of CMD both among women (physical activity – PR: 0.66; 95%CI 0.55-0.79; leisure activities – PR 0.59; 95%CI 0.51-0.69) and men (physical activity – PR: 0.59; 95%CI 0.43-0.84; leisure activities – PR 0.61; 95%CI 0.41-0.92). Social support at work, smoking, and use of alcohol were not related to the prevalence of CMD (Table 2).

In the multivariate analysis, three adjustment models were tested: with positive coping strategies (Table 3), negative coping strategies (Table 4), and positive and negative coping strategies (Table 5). The following results were found: a) association of occupational stressors and CMD – among women, situations of high demand and low control (separately or combined) were associated with CMD, and, among men, only combined exposure (high demand job) was associated with CMD; b) practice of physical activity

### Table 3. Final model of the relationship between occupational stress and common mental disorders (CMD), adjusted by positive coping strategies, among workers in Bahia, 2012

| Variables          | CMD                        | Total | Women | Men           |
|--------------------|----------------------------|-------|-------|---------------|
|                    | PR* | PR† | 95%CI† | p-value† | PR* | PR† | 95%CI† | p-value† | PR* | PR† | 95%CI† | p-value† |
| Active job         | 162 | 1.62 | 132.233 | 0.00 | 170 | 1.62 | 140.267 | 0.00 | 1.38 | 1.63 | 0.69-2.22 | 0.47 |
| Passive job        | 123 | 1.23 | 103.818 | 0.03 | 131 | 1.23 | 108.204 | 0.01 | 0.89 | 0.99 | 0.54-1.79 | 0.97 |
| High-strain job    | 200 | 2.00 | 159.270 | 0.00 | 208 | 2.00 | 163.297 | 0.00 | 1.71 | 1.63 | 0.95-2.83 | 0.07 |
| Social support     | -   | 1.05 | 0.88-1.26 | 0.54 | -   | 1.05 | 0.81-1.24 | 0.94 | -   | 1.25 | 0.85-1.84 | 0.25 |
| Physical activity  | -   | 0.68 | 0.58-0.81 | 0.00 | -   | 0.68 | 0.59-0.87 | 0.00 | -   | 0.60 | 0.42-0.86 | 0.01 |
| Leisure activities | -   | 0.68 | 0.53-1.08 | 0.13 | -   | 0.68 | 0.50-1.05 | 0.09 | -   | 1.05 | 0.31-3.60 | 0.94 |

95%CI = 95% confidence interval; PR = prevalence ratio.
* Unadjusted PR.
† Values adjusted for positive coping strategies: physical activity, leisure activities, social support.

### Table 4. Final model of the relationship between occupational stress and common mental disorders (CMD), adjusted by negative coping strategies, among workers in Bahia, 2012

| Variables          | CMD                        | Total | Women | Men           |
|--------------------|----------------------------|-------|-------|---------------|
|                    | PR* | PR† | 95%CI† | p-value† | PR* | PR† | 95%CI† | p-value† | PR* | PR† | 95%CI† | p-value† |
| Active job         | 162 | 1.62 | 138.232 | 0.00 | 170 | 1.62 | 146.262 | 0.00 | 1.38 | 1.36 | 0.77-2.41 | 0.27 |
| Passive job        | 123 | 1.23 | 0.96-1.65 | 0.07 | 131 | 1.23 | 102.182 | 0.04 | 0.89 | 0.97 | 0.53-1.78 | 0.94 |
| High-strain job    | 200 | 2.00 | 172.278 | 0.00 | 208 | 2.00 | 175.301 | 0.00 | 1.71 | 1.85 | 1.10-2.33 | 0.02 |
| Alcohol            | -   | 0.93 | 0.80-1.08 | 0.37 | -   | 0.93 | 0.77-1.08 | 0.32 | -   | 1.19 | 0.83-1.69 | 0.33 |
| Smoking            | -   | 1.02 | 0.84-1.23 | 0.82 | -   | 1.02 | 0.84-1.30 | 0.66 | -   | 0.98 | 0.66-1.47 | 0.96 |

95%CI = 95% confidence interval; PR = prevalence ratio.
* Unadjusted PR.
† Values adjusted for negative coping strategies: use of alcohol and smoking.
among men and women contributed to reduce the occurrence of CMD regardless of psychosocial aspects; c) leisure activities, despite having a lower prevalence of CMD, did not reach statistical significance, losing relevance for the prevalence of CMD in the presence of occupational stressors; d) use of alcohol, smoking, and social support were not associated with CMD.

Coping strategies did not change the effect of DCM dimensions on the prevalence of CMD among healthcare workers, thus highlighting the relevance of occupational stress for mental illness. However, it is worth noting that physical activity, regardless of the stressful occupational situation, reduced the prevalence of CMD. Therefore, this factor that also deserves attention in interventions in workplaces and in people’s lives. Finally, women were found to be more exposed to occupational stress and to CMD – another factor to be highlighted in future investigations.

**DISCUSSION**

Psychosocial aspects were associated with CMD, especially high demand, which remained associated with CMD, among men and women, in all models adjusted for coping strategies. There was an increase strength of association between DCM dimensions and CMD in the adjusted models, which emphasized the relevance of occupational stress for mental illness, despite the use of coping strategies by workers.

Among positive coping strategies, physical activity was most relevant factor to reduce the prevalence of CMD, regardless of occupational stress, among men and women. Negative strategies (use of alcohol and smoking) were not associated with CMD among the groups.

The high prevalence of CMD in this group corroborates findings from other studies conducted with healthcare workers. The higher prevalence of CMD among women has also been described in the literature.

Situations of occupational stress are associated with the occurrence of CMD, whose prevalence is higher in high-strain jobs. This result reinforces literature findings indicating a higher frequency of psychic illness when work is performed in a situation of low control and high demand combined.

Women were the group most exposed to mental illness resulting from occupational stress. It is worth noting the greater vulnerability of women to occupy more stressful work positions, with greater exposure to mental illness. Gender determines the structure of social opportunities, such as education and income, as well as exposure to risks and social and health conditions.

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**Table 5.** Final model of the relationship between occupational stress and common mental disorders (CMD), adjusted by positives and negative coping strategies, among workers in Bahia, 2012

| Variables             | Total | CMD | Total | CMD | Total | CMD |
|-----------------------|-------|-----|-------|-----|-------|-----|
|                       | PR*   | PR† | 95%CI† | p-value† | PR*   | PR† | 95%CI† | p-value† | PR*   | PR† | 95%CI† | p-value† |
| Active job            | 1.62  | 1.84| 1.36-2.48 | 0.00 | 1.70  | 2.05| 1.46-2.89 | 0.00 | 1.38  | 1.24| 0.66-2.34 | 0.49 |
| Passive job           | 1.23  | 1.31| 0.97-1.77 | 0.07 | 1.31  | 1.41| 1.00-1.98 | 0.49 | 0.89  | 1.06| 0.55-2.02 | 0.86 |
| High-strain job       | 2.00  | 2.17| 1.63-2.87 | 0.00 | 2.08  | 2.28| 1.65-3.14 | 3.14 | 1.71  | 1.80| 1.01-3.23 | 0.04 |
| Social support        | -     | 1.04| 0.85-1.26 | 0.73 | -     | 0.99| 0.79-1.24 | 0.98 | -     | 1.21| 0.80-1.83 | 0.35 |
| Physical activity     | -     | 0.71| 0.59-0.84 | 0.00 | -     | 0.75| 0.61-0.92 | 0.01 | -     | 0.58| 0.40-0.85 | 0.00 |
| Leisure activities    | -     | 0.88| 0.55-1.43 | 0.63 | -     | 0.89| 1.46-2.89 | 0.00 | -     | 0.87| 0.25-2.95 | 0.83 |
| Alcohol               | -     | 1.03| 0.86-1.22 | 0.71 | -     | 1.08| 0.88-1.33 | 0.41 | -     | 0.82| 0.55-1.21 | 0.33 |
| Smoking               | -     | 0.99| 0.79-1.25 | 0.97 | -     | 0.96| 0.74-1.26 | 0.81 | -     | 1.05| 0.66-1.64 | 0.84 |

95%CI = 95% confidence interval; PR = prevalence ratio.
* Unadjusted PR.
† Values adjusted by positive and negative strategies: physical activity, leisure activities, high social support, use of alcohol, smoking.
High psychological demand at work represents a risk factor for mental illness, whereas low control over work is related to increased occupational stress and, thus, to CMD.\textsuperscript{1,5,12} Frequent exposure to situations of high psychological demand and low control over work may cause important repercussions for workers’ mental health, through psychological wear.

When workers are in a positive emotional state, they adopt healthy coping strategies, which may promote the good functioning of the organism, favoring health behaviors and enhancing rewarding interpersonal relationships.\textsuperscript{21}

Religious activities, sports activities, walking, cinema, dance, and talking to friends (social support) are considered strategies that help in the process of relieving tension and also help release physical and environmental wear. Thus, positive coping strategies are expected to reduce the prevalence of CMD. In this study, for example, the use of positive strategies, such as physical activity, contributed to reduce the outcome among men and women.

Physical and leisure activities have been associated with a lower prevalence of CMD among workers. These strategies are believed to exert a positive impact on health and quality of life, working as a strategy to cope with problems resulting from the work environment.\textsuperscript{10,11,22}

Physical activity, among non-pharmacologic therapies available to prevent and treat CMD, represents an important therapeutic modality, contributing to wellbeing, self-esteem, and control of stress, anxiety, and depression symptoms. Although the positive effects of physical activity on mental health have already been described, there is still a certain difficulty in studying about the recommended exercise and the amount and intensity of activity necessary to produce significant effects.\textsuperscript{22}

Leisure activities are also described as factors that may minimize the occurrence of CMD; furthermore, these activities work as compensatory mechanisms against stress, anguish, anxiety, and other mental disorders, thus relieving tension, recharging energies and promoting pleasure, relaxation, and well-being to their practitioners.\textsuperscript{12,23} Lack of leisure and physical activities and work overload may lead to stress and to physical, psychological and social illness.

The presence of social support is pointed as a factor associated with better general health outcomes and represents an important coping strategy in stressful situations. Moreover, social support moderates the detrimental effects caused by occupational stressors, reducing psychological damage.\textsuperscript{12} However, no association was found between social support and CMD in this study, which may be related to the mechanism that occurs in ways of working and to interpersonal relationships.

Interpersonal relationships are essential in any organization. The way how this environment is shaped and structured influences people’s quality of life, their own behavior, and the personal goals of each human being. The deterioration of interpersonal relationships creates a poor organizational climate, the emergence of internal disputes, work mismatch, and weakness of relationships in an environment where good interaction with others would protect from the damages caused by the environment itself.\textsuperscript{24} It is believed that the use of social strategies should be developed aiming at appropriate interaction and support between individuals, consequently leading to better mental health conditions.\textsuperscript{25}

Negative coping strategies were also employed against occupational stress, e.g., alcohol and tobacco. These strategies enhance several health problems, thus being considered an additional risk factor to healthcare workers.\textsuperscript{16,27} The association of use and abuse of drugs (both legal and illegal) with CMD has been discussed worldwide. Studies in countries like Brazil, England, Greece, South Africa, and other Latin American and Caribbean countries found relevant associations between prevalence of CMD and drug abuse.\textsuperscript{28}

Although alcohol consumption was not associated with the occurrence of MCD, this finding may be interpreted as a strategy used by workers, working as a source of relief, being therefore a protective factor for the occurrence of MCD. However, it is worth highlighting that the use of alcohol, even in small amounts, affects the serotonin system that is related to depression and other CMD.\textsuperscript{29}
Alcohol may be used to deal with stress, insomnia, fatigue, and irritability, which may lead individuals to engage in harmful drinking habits. Therefore, the use of negative coping strategies may make workers more vulnerable to mental illness in the long term.

Continuously experiencing stressful situations for long periods may contribute to the adoption of harmful health behaviors, such as consumption of alcohol, tobacco, drugs, and medications. Initially, these conduits help deal with stressful situations; however, in the long term, may aggravate symptoms and increase the effects of occupational stress on mental health. In this case, these strategies become little effective and detrimental to individual's health, thus increasing symptoms and their severity, working as negative strategies. Although this result was not observed in the present study, it is important to highlight that this reality may be identified in the population concerned, due to environment where this reality is defined.

Finally, it was observed that positive coping strategies (physical activity, leisure activities, and social support), included in the final regression model, were not sufficient to minimize the harmful effects of occupational stress on the occurrence of CMD among workers, when analyzed separately or combined with negative strategies, among all strata. Therefore, the relevance of occupational stress for mental illness in these workers is emphasized.

As limitations of this study, it is important to highlight those inherent to cross-sectional studies, such as potential reverse causality and the healthy worker effect. Although occupational stressors are associated with psychological damage among workers, this relationship may also be inverse, in which mental illness may cause or aggravate the perception of occupational stress. Furthermore, workers with several mental distress are certainly away from the labor market, especially in the healthcare sector, an area with high psychic demands, having an impact also on prevalence bias, in which the observed findings may be underestimated.

It is also important to highlight the small number of published studies on the relationship between coping strategies, occupational stress, and CMD, which limited comparison, analysis, and discussion of results. However, despite limitations, the study shows relevant data to the workers’ health field, especially of healthcare workers, related to the importance of coping strategies for the mental health of these groups.

**CONCLUSIONS**

In this study, occupational stress was associated with CMD, especially high demand. The practice of physical and leisure activities reduced the prevalence of CMD among men and women, thus confirming the positive nature of these strategies. Social support, in turn, was not associated with CMD among the groups studied, as well as alcohol consumption and smoking.

Adjustment of the models for positive and negative coping strategies did not change the direction of the effect of DCM dimensions on CMD, thus emphasizing the relevance of occupational stress for mental illness among healthcare workers. It was also possible to observe the greater female exposure to situations of occupational stress and mental illness.

Finally, due to high prevalence of CMD found in this study, there is the need of more publications, guidelines, and interventions about CMD and its negative consequences for healthcare workers and for the health organization. The elucidation of coping strategies as measures to combat damages to workers’ mental health resulting from occupational stress, is also an evident need. This reinforces the need to redefine the psychosocial characteristics of work and the pertinence of adopting appropriate strategies, which reduce the effect of occupational stress and thus the occurrence of CMD, considering the gender inequalities present in the work environment and favoring mental health prevention and promotion at work.

**Author contributions**

EMS was responsible for conceptualization, methodology, investigation, formal analysis, writing – original draft and review & editing of the article, and validation of the final manuscript version. TMA, CCS, AMCF, FOS, and IL were responsible for methodology, investigation, formal analysis of information, writing – original draft and review & editing of the article and validation of the final manuscript version. All authors have read and approved the final version submitted and take public responsibility for all aspects of the work.
REFERENCES

1. Araújo TM, Mattos AI, Almeida MM, Santos KO. Psychosocial aspects of work and common mental disorders among health workers: contributions of combined models. Rev Bras Epidemiol. 2016;19(3):645-57.

2. Melo LP, Carloto MS, Rodriguez SYS, Diehl L. Estratégias de enfrentamento (coping) em trabalhadores: revisão sistemática da literatura nacional. Arq Bras Psicol. 2016;68(3):125-44.

3. Pereira SS, Teixeira CAB, Reisidorfer E, Vieira MV, Donato ECSG, Cardoso L. A relação entre estressores ocupacionais e estratégias de enfrentamento em profissionais de nível técnico de enfermagem. Texto contexto enferm. 2016;25(4):e2920014.

4. Santos AMVS, Lima CA, Messias RB, Costa FM, Brito MFSF. Transtornos mentais comuns: prevalência e fatores associados entre agentes comunitários de saúde. Cad Saúde Colet. 2017;25(2):160-8.

5. Lua I, Araújo TM, Santos KOB, Almeida MMG. Factors associated with common mental disorders among female nursing professionals in primary health care. Psicol-reflex crit. 2018;31:20.

6. Goldberg D, Huxley P. Common mental disorders – a bio-social model. 2nd. ed. London: Tavistock/Routledge; 1993.

7. Karasek Jr. RA. Job demands, job decision latitude, and mental strain: implications for job redesign. Adm Sci Q. 1979;24(2):285-308.

8. Lazarus R, Folkman S. Stress appraisal and coping. New York: Springer; 1984; p. 444.

9. Trindade LL, Lautert L, Beck CLC. Mecanismos de enfrentamento utilizados por trabalhadores esgotados e não esgotados da estratégia de saúde da família. Rev Latino-am Enfermagem. 2009;17(5):1-7.

10. Silva AO, Cavalcante Neto JL. Associação entre níveis de atividade física e transtorno mental comum em estudantes universitários. Motricidade. 2014;10(1):49-59.

11. Rios LC, Almeida MMG, Rocha SV, Araújo TM, Pinho PS. Atividades físicas de lazer e transtornos mentais comuns em jovens de Feira de Santana, Bahia. Rev Psiquiatr Rio Gd Sul. 2011;33(2):98-102.

12. Mattos AIS, Araújo TM, Almeida MMG. Interação entre demanda-controle e apoio social na ocorrência de transtornos mentais comuns. Rev Saúde Pública. 2017;51:48.

13. Braga LC, Carvalho LR, Binder MCP. Condições de trabalho e transtornos mentais comuns em trabalhadores da rede básica de saúde de Botucatu (SP). Cienc saude colet. 2010;15(1):1585-96.

14. Santos KOB, Carvalho FM, Araújo TM. Consistência interna do Self-Reporting Questionnaire-20 em grupos ocupacionais. Rev Saúde Pública. 2016;50:6.

15. Breslow NE, Day NE. Statistical methods in cancer research. Volume I - The analysis of case-control studies. IARC Sci Publ. 1980;(32):5-338.

16. Mantel N, Haenszel W. Statistical aspects of the analysis of data from retrospective studies. J Natl Cancer Inst. 1955;22(4):719-48.

17. Hosmer DW, Lemeshow S. Applied logistic regression. 2nd. ed. New York: John Wiley and Sons; 2000.

18. Smolen JR, Araújo EM, Oliveira NF, Araújo TM. Intersectionality of race, gender, and common mental disorders in Northeastern Brazil. Ethn Dis. 2018;28(3):207-14.

19. Nascimento JOV, Santos JD, Meira KC, Pierin AMG, Souza-Talarico JN. Shift work of nursing professionals and blood pressure, burnout and common mental disorders. Rev Esc Enferm USP. 2019;53:e03443.

20. Quinn MM, Smith PM. Gender, work, and health. Ann Work Expo Health. 2018;62(4):389-92.

21. Chamon EMQO, Marinho RC, Oliveira AL. Estresse ocupacional, estratégias de enfrentamento e síndrome de burnout: um estudo com a equipe de enfermagem de um hospital privado do estado de São Paulo. Anais do Encontro Nacional da Associação Nacional de Pós-Graduação e Pesquisa em Administração; 23-27 set. 2006; Salvador, Bahia.

22. Rocha SV, Araújo TM, Almeida MMG, Virtuoso Jr JS. Prática de atividade física no lazer e transtornos mentais comuns entre residentes de um município do Nordeste do Brasil. Rev Bras Epidemiol. 2012;15(4):871-83.

23. Leão ER, Dali Fabbro DR, Oliveira RB, Santos IR, Victor ED, Aquirone RL, et al. Stress, self-esteem and well-being among female health professionals: a randomized clinical trial on the impact of a self-care intervention mediated by the senses. PLoS One. 2017(12):e0172455.

24. Sanguanklin N, McFarlin BL, Finnegan L, Park CG, Giurgescu C, White-Traut R, et al. Job strain and psychological distress among employed pregnant Thai women: role of social support and coping strategies. Arch Womens Ment Health. 2014;17(4):317-26.

25. Silva AG, Cerqueira ATA, Ramos LMCP. Apoio social e transtorno mental comum entre estudantes de Medicina. Rev Bras Epidemiol. 2014;17(1):229-42.

26. Instituto Nacional de Ciência e Tecnologia para Políticas Públicas de Álcool e Outras Drogas. II Levantamento Nacional de Álcool e Drogas (LENAD) [Internet]. São Paulo: UNIFESP; 2014 [citado em 04 de ago. 2020]. Disponível em: https://inpad.org.br/wp-content/uploads/2014/03/Lenad-II-Relat%C3%B3rio.pdf

27. Soares MH, Oliveira FS. A relação entre álcool, tabaco e estresse em estudantes de enfermagem. SMAD Rev Eletrônica Saúde Mental Álcool Drog. 2013;9(2):88-94.
28. Merchán-Hamann E, Leal EM, Musso LB, Estrada MG, Reid P, Kulakova OV, et al. Comorbilidad entre abuso/dependencia de drogas y el distrés psicológico en siete países de Latinoamérica y uno del Caribe. Texto Contexto Enferm. 2012;21(Esp):87-95.

29. Scheffer M, Pasa GG, Almeida RMM. Dependência de álcool, cocaína e crack e transtornos psiquiátricos. Psicol Teor Pesq. 2010;26(3):533-41.

30. Junqueira MAB, Ferreira MCM, Soares GT, Brito IE, Pires PLS, Santos MA, et al. Uso de álcool e comportamento de saúde entre profissionais da enfermagem. Rev Esc Enferm USP. 2017;51:e03265.

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