INTRODUCTION

Previous studies have shown that work is an important factor associated with both pleasure and stress.\(^{(1-4)}\) Stress is a current problem and has been the subject of multidisciplinary studies in several areas because it poses risks to human health. The main factors that can trigger stress in the work environment involve work-related aspects, including work organization, management, hierarchy, and interpersonal relations, all of which are associated with psychosocial factors.\(^{(5-13)}\)

According to the International Labour Organization, the adequacy of working conditions that meet workers' expectations favors their physical and mental health, provided that the risks are kept under control.\(^{(14)}\) In recent years, the relationship between work-related stress and workers' mental health has been the subject of
Hospital-based work is characterized by depersonification, which is the feature of BS. Therefore, depersonification is the dimension that triggers BS, and it occurs when the worker adopts negative attitudes that are accompanied by insensitivity and lack of motivation. Lastly, low personal accomplishment is evident when there is a trend toward negative professional self-evaluation, increased irritability, low productivity, poor work relations, and lack of motivation, leading to work dissatisfaction.

Emotional exhaustion is characterized by exhaustion or loss of emotional resources and energy, leading to lack of enthusiasm, frustration, tension, and fatigue. Depersonification is marked by the development of negative feelings and attitudes at work and is considered a unique feature of BS. Therefore, depersonification is the dimension that triggers BS, and it occurs when the worker adopts negative attitudes that are accompanied by insensitivity and lack of motivation. Lastly, low personal accomplishment is evident when there is a trend toward negative professional self-evaluation, increased irritability, low productivity, poor work relations, and lack of motivation, leading to work dissatisfaction.

Studies conducted in North and South America indicate that BS is a significant psychosocial problem, attracting the interest and concern of the international scientific community in North America and Europe because of its individual and collective consequences. Hospital-based work is characterized by excessive workloads, contact with challenging situations, and high levels of stress and risk. Owing to the intrinsic characteristics of the work, medical and nursing teams are more susceptible to occupational stress. Physical and mental overload are responsible for the stress at work among doctors, nurses, nursing assistants, and nursing technicians working in critical care sectors.

This study aims to evaluate the prevalence of BS among nursing workers in intensive care units and establish associations with psychosocial and sociodemographic factors.

**METHODS**

This cross-sectional and descriptive study collected data between 2010 and 2011. A total of 130 workers participated in the study, including nurses, nursing technicians, and nursing assistants from the intensive care unit (ICU) and coronary care unit of 2 large federal hospitals located in the metropolitan area of Rio de Janeiro, Brazil. The study was approved by the Research Ethics Committee of the 2 institutions, according to the provisions of Resolution No. 466/2012 of the Brazilian National Health Council for research involving human beings, following established guidelines. This study is part of a doctoral thesis and was approved by the Research Ethics Committee of the Fundação Oswaldo Cruz in 2013 under protocol no. 480.999. The professionals were interviewed during work breaks and were informed of the purposes of the study, and an informed consent form was signed by the individuals who agreed to participate.

The inclusion criteria included employment in the respective sectors for at least 6 months and transfer to other sectors for the same period to avoid healthy worker bias. Workers who were transferred because of stress-related disorders were included, answered the questionnaire by phone, and subsequently gave their written consent.

A team of 4 previously trained medical residents was coordinated by an adviser and guided each participant in the completion of the questionnaire to avoid missing data and inconsistencies. The data collected formed a database and involved double entry (2 databases for overlapping), data auditing, and data revision to eliminate typos and inconsistencies.

We used a scale adapted and validated for the Portuguese language and based on the short version of the Job Stress Scale (JSS), originally developed in English, and the responses were provided following a Likert scale (1-4) that ranged from “often” to “never/rarely.” The JSS identified 3 work-related aspects: psychological demands, control over activities, and social support experienced by the workers. Psychological demand refers to the control of time to perform tasks and resolve conflicts during decision-making. Control over activities is related to the ability to perform tasks and the opportunity to participate in decisions. The aspect “social support”, which is defined as the social atmosphere of the workplace and includes emotional aspects and instrumental support at work, was added to the original model. The instrument allows the construction of quadrants resulting from combinations of the following dimensions: “low strain” (combination of low demand and high control), “high strain” (combination of high demand and low control), “passive work” (combination of low demand and low control), and “active work” (combination of high demand and high control). For the construction of the quadrants based on the combination of demand and control dimensions, the scores were summed, and the combinations were classified into high or low, considering the median as the cutoff point.
Common mental disorders (CMDs) were assessed according to the shortened version of the Self Reporting Questionnaire (SRQ-20), an instrument developed by Harding et al. (1980). For instrument validation, the cutoff point of 5 positive answers for men and 7 positive answers for women was considered. This study adopted a cutoff point of 7 for suspicion of development of CMDs on the basis of previous studies on nursing professionals.

BS was measured by applying the Maslach Burnout Inventory (MBI), which is an instrument containing 22 questions. The MBI is answered on a 5-point frequency scale and evaluates 3 dimensions: emotional exhaustion (9 questions), depersonification (5 questions), and personal accomplishment (8 questions) in the version adapted and validated for Portuguese using nursing professionals. The score was obtained from the sum of the values in each subscale. Cutoff points were used as follows: in the emotional exhaustion subscale, a score of ≥ 27 indicated a high level of exhaustion; a score of 19-26 indicated an intermediate level; and a score of < 19 indicated a low level. In the depersonification subscale, a score of ≥ 10 indicated a high level; a score of 6-9 indicated an intermediate level; and a score of < 6 indicated a low level.

Due to the lack of consensus in the scientific literature for diagnosis, a high level of emotional exhaustion and depersonification and a low level of personal accomplishment or imbalance in a single dimension were used as diagnostic criteria for BS. Prevalence was also measured using the criterion of Golembiewski, Manzenrieder, and Carter, who considered only depersonification as a predictor of BS. In addition, this study investigated the possibility of evaluating BS using the tertiles obtained for each variable.

Descriptive statistical analysis included measures of central tendency and dispersion and the analysis of frequencies. Each subscale was scored according to the aforementioned standards, in addition to the calculation of standard deviation (SD), 25th and 75th percentiles, and Cronbach's alpha. For statistical analysis, the criterion of Grunfeld et al. was used. For data analysis, the Statistical Package for Social Sciences (SPSS) version 21 software was used.

RESULTS

Sociodemographic and work-related variables

The study group was composed of 130 nurses from 2 large federal hospitals. Among them, 58 nurses were mixed race, indigenous, or East Asians and were classified as multi-ethnic (44.6%). The group was composed of 65 men and 65 women; the mean age was 35 years (28 to 41.2), and 68 participants (52.3%) were older than the mean. A total of 81 participants (62.3%) had completed high school; 54.6% lived with a partner; 68 participants (52.3%) did not have children. The mean income per capita was 7 minimum wages, and 53.8% earned less than that.

The study group included 80 (61.5%) workers in hospital A and 50 (38.5%) workers in hospital B; the study group was composed of 37 nurses (28.5%), 62 nursing technicians (47.7%), and 31 nursing assistants (23.8%). In addition, 78 (60.0%) workers worked in the ICU and 52 (40.0%) in the coronary care unit. The majority (60.8%) had a formal contract, 71.5% were part of the permanent staff of the institution, and 55.4% worked in a mixed shift. The period of employment in the sector was 3 (1-7.25) years. The median length of time in the profession was 12 (5-18) years, and 70 workers (53.8%) had lengths of time lower than this range. The mean weekly workload was 51.0 ± 19.3 hours, and the participants were equally divided above and below this mean.

Evaluation of psychosocial factors

Most workers (106, 81.5%) reported not thinking about work during their free time. With regard to self-reported levels of stress, 93 professionals (71.5%) reported having an average level of stress. The dimensions “demand”, “control”, and “social support” had medians of 10 (9-11), 12 (11-14), and 11 (9.75-13) points, respectively.

In the quadrants of the demand-control model, 40 workers (23.8%) performed high-strain, 32 active (24.6%), 27 passive (20.8%), and 31 low-strain (30.8%) work. The prevalence of suspicious cases of CMDs was 27.7%, corresponding to 36 workers.

Burnout syndrome scores description

In this study, the mean values for each subscale were the following: emotional exhaustion, 24.5 points; depersonification, 9.0 points; and personal accomplishment, 30.3 points. The scores obtained for emotional exhaustion and depersonification were among the standard mean values. By contrast, the scores for personal accomplishment were lower than the standard mean values because of the reverse score count, i.e., low scores were considered high values, as shown in table 1.
The MBI results indicated that 49 workers experienced high levels of emotional exhaustion (37.7%) with a median of 24 (18-31) points. Depersonification averaged 9 (7-11) points and included 2 strata: a group of 50 workers (38.5%) with intermediate values and a group of 49 workers (37.7%) with high values. The prevalence of personal accomplishment was high, represented by 79 individuals (60.8%) with a median of 30.3 (26-36) points.

The prevalence of BS, calculated according to the criteria of Grunfeld et al., was 55.3%, corresponding to 72 cases considering 1 risk dimension. In addition, 49 cases (37.7%) were found using the criteria of Golembiewski et al. In this study, the sum of the scores for each dimension and the inclusion of tertiles allowed the construction of combinations with high, medium, and low values, and 14 cases (10.7%) were identified using these criteria. No cases of BS were identified using the classification of Ramirez et al., as shown in table 2.

**Suspicion of burnout syndrome and association with socio-demographic, work-related, and psychosocial factors**

No significant association was found between the prevalence of BS and the sociodemographic and work-related variables (Table 3).

Several multivariate models were analyzed and adjusted for confounding factors. The workers in the categories “active work” (odds ratio - OR = 0.27; 95% confidence interval - 95%CI 0.09 - 0.81) and “passive work” (OR = 0.29; 95%CI = 0.09 - 0.87) experienced protection using this model after adjusting for social support, indicating the decreased likelihood of BS among professionals in these intermediate stress categories. This protection ceased in model 2 with the inclusion of CMDs, although the protection was maintained for the category “active work” after the inclusion of social support and CMDs in this model. In the adjusted model containing the confounding factors, the intermediate stress categories maintained statistical significance as protective factors for BS in the range of 72%-78% (Table 4).

### Table 1 - Burnout syndrome scores among nursing workers in intensive care units using the Maslach Burnout Inventory

| Dimensions investigated | Number of questions | Level | Score | Mean | Standard deviation | Cronbach’s alpha |
|-------------------------|---------------------|-------|-------|------|-------------------|------------------|
| Emotional exhaustion    | 9                   | ≤ 27  | 19 - 26 | < 19 | 24.5 | 9.3 | 0.992 |
| Depersonification       | 8                   | ≥ 10  | 6 - 9  | < 6  | 9.0  | 3.4 | 0.649 |
| Personal accomplishment | 5                   | ≤ 33  | 34 - 39 | ≥ 40 | 30.3 | 6.9 | 0.828 |

### Table 2 - Results of the Maslach Burnout Inventory applied to nursing workers in intensive care units, N = 130

| Dimensions                                      | Burnout syndrome |
|-------------------------------------------------|------------------|
| Emotional exhaustion                            | 24.5 ± 9.3       |
| Low                                             | 44 (33.8)        |
| Intermediate                                    | 37 (28.5)        |
| High                                            | 49 (37.7)        |
| Intermediate to high                            | 86 (66.2)        |
| Depersonification                               | 9.0 ± 3.4        |
| Low                                             | 31 (23.8)        |
| Intermediate                                    | 50 (38.5)        |
| High                                            | 49 (37.7)        |
| Intermediate and high                           | 99 (76.2)        |
| Personal accomplishment                         | 30.3 ± 6.9       |
| Low                                             | 6 (4.6)          |
| Intermediate                                    | 45 (34.6)        |
| High                                            | 79 (60.8)        |
| Low and intermediate                            | 51 (39.2)        |
| Measurement criteria                            |                  |
| Grunfeld et al. (25)                            | 72 (55.3)        |
| Golembiewski et al. (26)                        | 49 (37.7)        |
| Ramirez et al. (49)                             | 00 (00.0)        |
| Dimension tertiles*                             | 14 (10.7)        |

* Distribution in tertiles of each dimension in combination: high emotional exhaustion; low personal accomplishment, high level of depersonification (tertiles 3, 1, and 3, respectively). Grunfeld et al. (25) - high level of emotional exhaustion OR high level of depersonification OR low level of personal accomplishment. Golembiewski et al. (26) - high level of depersonification (considered the first stage). Ramirez et al. (49) - high level of emotional exhaustion AND high level of depersonification AND low level of personal accomplishment. The results are expressed as the means ± standard deviation and N (%).

**DISCUSSION**

The findings of the present study are relevant to workers’ health, particularly for nursing professionals working in intensive care units, as evaluated by the prevalence of BS reported in Brazil and abroad. High scores were found for emotional exhaustion and depersonification, and the prevalence of suspicion of BS was considerable and revealed the influence of the organization and the nature of the work on these outcomes.
The prevalence of suspicious cases of CMDs was 27.7% (36 cases), i.e., slightly higher than that obtained in previous studies. Silva et al. found a prevalence of 21.3% among nursing workers in ICUs. The studies of Pinho and Araujo, with emergency nursing workers, and Kirchhof et al., with university hospital nurses, obtained a prevalence of 26.3% and 18.7%, respectively. In these 2 studies, the prevalence in the high-strain group was higher.

With regard to the dimension of emotional exhaustion, this study found a mean of 24 points. The studies of Losa Iglesias et al., with nursing professionals in ICUs in Spain, and Suñer-Soler et al., with medical and nursing staff in Spanish hospitals, obtained 25.19 points and 22.40 points, respectively.

Emotional exhaustion, which is considered intermediate in this study group, is an important factor associated with quality of life. It has been reported that high levels of emotional exhaustion, a central factor in burnout, lead to deterioration in the quality of health and life, emotional distress, and lack of energy and have an inverse association with work performance.

This study obtained a mean of 9.00 points for depersonification, which was considered intermediate. The study of Moreira et al. involving nursing professionals in hospitals in Santa Catarina indicated an average of 7.79 points, which is slightly lower than that found in this study. Xie et al. obtained 11.39 points among nurses in hospitals in China. Depersonification is a coping strategy that develops after feelings of emotional exhaustion and low personal accomplishment. Using several mechanisms, the worker can become psychologically distant, cold, and cynical and treats patients and colleagues as objects who deserve the problems they have. Furthermore, psychological distancing occurs as a
defensive confrontation strategy, developed to address emotional exhaustion.\textsuperscript{(53,55,57,58)}

The mean value for personal accomplishment (reverse score) was 30 points, which is considered high. A study by Van Bogaert et al.\textsuperscript{(59)} with nurses in Belgian hospitals and the study by Xie et al.\textsuperscript{(56)} found mean values of 34.34 and 34.79 points for this dimension, respectively. The study of Schmidt et al. conducted with nurses in ICUs in Parana, Brazil, obtained 25.00 points for personal accomplishment, which was below the mean found in this study.\textsuperscript{(23)} The perception of the importance of one’s own work has undeniable importance for a worker’s self-esteem.\textsuperscript{(28)} Low personal accomplishment results in decreased productivity and lack of fulfillment at work and may be exacerbated by the lack of social support and opportunities for personal development.\textsuperscript{(55)} It should be borne in mind that the ICU is a place where difficulties in interpersonal relationships either with the family members of patients or with members of the multidisciplinary team, the desire to abandon work, lack of personal accomplishment, and work overload (e.g., overcrowding, lack of preparation of the technical staff, and inadequate physical space), among other factors, can negatively influence the quality of work.\textsuperscript{(30)}

It is observed that the values for these variables fluctuated in the countries where the MBI was applied, although the values were similar in the ICU setting. Among the studies that evaluated prevalence, Tironi et al.\textsuperscript{(53)} reported prevalence values similar to those of the present study using the criteria of Grunfeld et al.\textsuperscript{(25)} BS has physical and mental consequences for health workers, including cardiovascular disorders, chronic fatigue, headaches, migraines, peptic ulcer, insomnia, muscle or joint pain, anxiety, depression, and irritability, among others.\textsuperscript{(54,60)} It can also interfere with a worker’s personal life, including family relationships, and may cause resentment over the lack of time for child rearing and leisure. It affects the work place through absenteeism, increased work turnover, increases in violent behaviors, and decreases in the quality of work.\textsuperscript{(15,28)} BS is a gradual process, with a 10-year sensitization period followed by the possibility of increased susceptibility.\textsuperscript{(53)}

This study found no significant association between sociodemographic and work-related variables and BS most likely because of the small study sample. However, there was an association between psychosocial variables and the prevalence of BS among those who thought about work during their free time (p = 0.009) and among those who reported high levels of stress (p = 0.039). A significant association was also observed using the Karasek quadrants, considering that the prevalence was 72.5% among high-strain workers and 64.5% among low-strain workers (p = 0.006). Low demand had a greater influence on BS compared with high demand 69% (p = 0.001), which, to some degree, indicates that high demand is a determining factor for BS; this result is corroborated by the protective character observed in the active work group after the regression analysis. The data did not remain significant for the aspect “control at work” to allow the establishment of inferences concerning its role in the outcome. The prevalence of suspected cases of CMDs was 80.6% (p < 0.0001), indicating the close relationship between these subjective dimensions.

Although the bivariate analysis obtained significant values for high and low strain, which supports the hypothesis of increased psychological risk among those in these categories, these values were not significant after the logistic regression, suggesting protection in the intermediate quadrants “active work” and “passive work”, which are dimensions that encourage the development of new behaviors and creativity according to the precepts of Karasek and Theorell.\textsuperscript{(13)} Therefore, it can be observed that the diagonal A of the scheme indicated risk after the bivariate analysis, whereas the diagonal B was protective for BS after the multivariate analysis. Tironi et al. used bivariate analysis and found an association between BS during high strain conditions using the demand-control model.\textsuperscript{(53)}

For nursing, stress started to receive increased attention with the aim to explore the effects of BS.\textsuperscript{(19)} The nursing staff is more susceptible to the development of BS compared with other professions because of the characteristics of the work itself, which involves a great amount of responsibility for the life of patients and closeness with patients, for whom suffering is almost inevitable.\textsuperscript{(12,30,61)} The constant interaction between professional standards, integrity of the ego, and patient needs within the therapeutic relationship often leaves nursing workers vulnerable to stress, fatigue, and exhaustion.\textsuperscript{(19)}

Previous studies have indicated that health professionals have high values for the different dimensions associated with BS worldwide and that the consequences of BS range from decreased ability to work to labor disputes, which may lead to suicide.\textsuperscript{(17,18)} These professionals seem to experience specific conditions of occupational stress, and there is evidence of their exposure to high levels of
work-related stress, which increase even further among those working in ICUs.\(^{(27,30)}\) High levels of stress are also observed among nursing assistants, nursing technicians, nurses,\(^{(19,61,62)}\) and physicians.\(^{(33,63)}\)

Some limitations of the present study should be considered. The cross-sectional nature of the study imposes temporal limitations because of the inability to assess whether stress caused BS or the reverse. With regard to healthy worker bias, workers who were removed, transferred, and absent from work at ICUs and the reasons for their being away from work were investigated, and workers who were away from work for up to 6 months were included in the database after telephone contact and completion of the questionnaire at the hospital. The self-reported level of stress could be influenced by the dynamics of the work day or week, which could change the worker’s perception towards a greater or lesser level of stress. The lack of consensus in the literature concerning the criteria for suspicion of BS is a topic that needs to be addressed. It is believed that the small sample size is a potential limitation for statistical analysis, although several similar studies have shown consistency using smaller sample sizes; of note, to minimize the impact of this variable, this study evaluated the entire population of professionals working in the ICU. Given the calculation of OR in this sectional study, the possibility of overestimating risk should be considered. Despite the aforementioned limitations, the present results are similar to those of previous studies and contribute to elucidating the relationship between stress, assessed by the JSS, and BS, assessed by the MBI.

**CONCLUSION**

The observed prevalence of burnout syndrome was 55.3%, which underscores the exposure of nurses to risk factors for stress. This study found significant scores for emotional exhaustion and depersonification and high levels of stress, either self-reported or evaluated using the Job Stress Scale, for workers in the high-strain and low-strain categories; all the variables evaluated were associated with burnout syndrome. In addition, the prevalence of burnout syndrome significantly increased among those who thought about work during their free time and among those suspected of having common mental disorders. After the regression analysis using an adjusted model, active and passive work became a protective factor for burnout syndrome.

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**RESUMO**

**Objetivo:** Descrever a prevalência da síndrome de burnout entre trabalhadores de enfermagem de unidades de terapia intensiva, fazendo associação a aspectos psicossociais.

**Métodos:** Estudo descritivo seccional realizado com 130 profissionais, enfermeiros, técnicos e auxiliares de enfermagem, que desempenhavam suas atividades em unidades de terapia intensiva e coronariana de dois hospitais de grande porte na cidade do Rio de Janeiro (RJ). Os dados foram coletados em 2011, por meio de questionário auto aplicado. Foi utilizado o Maslach Burnout Inventory, para a aferição das dimensões de burnout, e o Self Report Questionnaire, para avaliação de transtornos mentais comuns.

**Resultados:** A prevalência de síndrome de burnout foi de 55.3% (n = 72). Quanto aos quadrantes do modelo demanda-controle, a baixa exigência apresentou 64,5% de casos prevalentes suspeitos e a alta exigência, 72,5% de casos (p = 0,006). Foi constatada a prevalência de 27,7% de casos suspeitos para transtornos mentais comuns; destes, 80,6% estavam associados à síndrome de burnout (< 0,0001). Após análise multivariada com modelo ajustado para sexo, idade, escolaridade, carga horária semanal, renda e pensamento no trabalho durante as folgas, foi constatado caráter protetor para síndrome de burnout nas dimensões intermediárias de estresse: trabalho ativo (OR = 0,26; IC95% = 0,09 - 0,69) e trabalho passivo (OR = 0,22; IC95% = 0,07 - 0,63).

**Conclusão:** Contatou-se que os fatores psicossociais estavam envolvidos no surgimento de burnout no grupo estudado. Os resultados despertaram a necessidade de estudos para intervenção e posterior prevenção da síndrome.

**Descritores:** Estresse; Esgotamento profissional; Equipe de enfermagem; Saúde do trabalhador; Unidades de terapia intensiva
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