

Psychosocial aspects of work and common mental disorders among health workers: contributions of combined models

Aspectos psicossociais do trabalho e transtornos mentais comuns entre trabalhadores da saúde: contribuições da análise de modelos combinados

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ABSTRACT: Objectives: The objective was to evaluate the contribution of the combined analysis of psychosocial stress at work and its association with common mental disorders (CMD) among health workers. **Methods:** A cross-sectional study was conducted on a representative sample of primary care workers from five counties in the state of Bahia, Brazil. The outcome variable — CMD — was assessed by the SRQ-20. The exposure models were the demand–control and effort–reward imbalance. **Results:** The partial and complete performance of the models and the combination of partial models were evaluated. The adjusted prevalence ratios were obtained by Poisson regression with robust variance method. The overall prevalence of CMDs was 21.0% and was associated with high strain and high effort–reward imbalance (ERI). The results demonstrated improved performance of the full ERI and the combination of partial models to predict the event. **Conclusion:** Thus, combined models are able to provide better estimates of the effects of stressful experiences in the work environment and the consequences on workers' health, offering greater contributions to this field of knowledge.

Keywords: Primary health care. Occupational health. Mental disorders. Cross-sectional studies. Epidemiologic methods. Health personnel.

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RESUMO: *Objetivo:* Avaliar a contribuição da análise de modelos combinados de estresse psicossocial no trabalho e sua associação com transtornos mentais comuns (TMC) entre trabalhadores da saúde. *Métodos:* Trata-se de estudo transversal conduzido com amostra representativa de trabalhadores da atenção básica de cinco municípios do estado da Bahia. A variável desfecho — os TMC — foi avaliada pelo SRQ-20. As variáveis de exposição foram os modelos demanda-controle e desequilíbrio esforço-recompensa. *Resultados:* Foram avaliados os desempenhos dos modelos parciais e completos e a combinação dos modelos parciais. As razões de prevalência ajustadas foram obtidas pelo método de regressão de Poisson com variância robusta. A prevalência global de TMC foi de 21,0% e esteve associada à alta exigência e ao alto desequilíbrio esforço-recompensa. Os resultados demonstraram melhor desempenho do modelo de desequilíbrio esforço-recompensa completo e da combinação dos modelos parciais para prever o evento. *Conclusão:* Modelos combinados são capazes de proporcionar melhores estimativas dos efeitos das experiências estressantes no ambiente de trabalho e seus resultados sobre a saúde, oferecendo maiores contribuições para este campo do conhecimento.

Palavras-chave: Atenção primária à saúde. Saúde do trabalhador. Transtornos mentais. Estudos transversais. Métodos epidemiológicos. Pessoal de saúde.

INTRODUCTION

In the field of occupational health, psychosocial aspects of the work have been subject of studies that revealed the existence of factors at work that generate suffering and illness. Among the instruments of evaluation of psychosocial aspects of work are the demand–control model (DCM), which was developed by Karasek¹, and effort–reward imbalance (ERI) model, which was conceived by Siegrist². Both are widely used in the literature and they aim at evidencing different aspects related to occupational stressors and their relationships with outcomes on health.

The DCM model advocates that when the worker’s control over their work is overwhelmed by the imposed demands, there are additional risks of physical and/or psychological illness. Therefore, this model emphasizes two dimensions: psychological demands, concerning the psychological requirements that are imposed to the employee, and control over their own work, which involves the use of skills and decision authority. The combination of these two dimensions allows experiencing four possibilities of work configurations and, consequently, health hazards of different nature and intensity³.

Subsequently, a third element for analysis was incorporated into the DCM, which is the “social support at work.” The inclusion of this third dimension was proposed by Johnson⁴ when considering that social support, a basic human need, would act as an important moderator for the impact of the demand, being a relevant protection system for the workers against pressures in the workplace. The instrument applied to measure the dimensions that compose the model is the Job Content Questionnaire (JCQ), whose content encompasses physical demands and job insecurity, besides psychological demands, job control, and social support at work.

On the other hand, ERI model is based on the concept of professional reciprocity, based on the assumption that, if the effort applied to work is greater than the reward received, a situation that predisposes workers to the development of diseases will be developed⁵. The imbalance scale between effort and reward is capable of measuring the occupational stress. Two dimensions are privileged in the model, as follows: the effort, which involves demands and obligations, and the reward, which is evidenced by compensation, support, and promotion possibilities. The model also has a third dimension, which is “the overcommitment to work,” reflecting an investment of more effort by the employee who seeks for approval and improving self-esteem. The combination of overcommitment to work with effort–reward imbalance leads to additional risks of disease emergence⁶.

Although widely applied in the literature, both models have limitations to analyze the possible explanations for the psychosocial dimensions of work and its relation with the health-disease process. DCM highlights aspects of the work tasks, whereas ERI model emphasizes the role of rewards⁷. In this context, recent studies have advocated the combined use of these models to better predict events related to workers’ health^{7,8}. In Brazil, no research has been conducted to evaluate the combination of stress models and their results on mental health. The aim of this study was to evaluate the contributions of the combined models of analysis of psychosocial work stress and its association with common mental disorders (CMD) among health workers.

METHODS

This is a cross-sectional study, which was conducted in five municipalities of the Bahia State, including Feira de Santana, Santo Antônio de Jesus, Itabuna, Jequié, and Salvador. It is part of a multicenter study performed by the Epidemiology Center of the *Universidade Estadual de Feira de Santana* [State University of Feira de Santana], with health workers to assess their conditions of work, employment, and health.

The population consisted of a representative and random sample of workers of primary health care, which was obtained by proportional stratified sampling by geographic area and occupational group, whose calculation considered the formula for finite populations. For the sample estimative, a study by Oliveira⁹ was considered, which revealed the relationship between effort–reward imbalance and CMD, whose parameters allowed adopting a larger sample size.

The following criteria were adopted: frequency of CMD among nonexposed people, equivalent to 15.4%; CMD frequency among exposed people, which accounted for 26.9%; a power of 90%; and 95% confidence interval. Because of possible losses/refusals, 20% were added to the value obtained for the sample, obtaining a total of 720 workers.

Data were collected using a questionnaire which was developed based on a literature review on scientific productions in the worker’s health field, specifically including studies conducted with health workers, concerning their health and working conditions. To test the instrument and ensure data quality, prior training with the researchers and a pilot study

were performed in a city of the Bahia State, with 30 health workers. Data were collected in 2012 by means of visits to health facilities in search for the selected workers.

The “outcome” variable — CMD — was measured by the Self-Reporting Questionnaire (SRQ-20), which is an instrument composed by 20 dichotomous questions (yes/no) that evaluated anxiety, somatic, and depression symptoms occurred in the last 30 days. The instrument obtained a performance that was acceptable to assess the mental health of workers in the Bahia State¹⁰. The cutoff point for CMD suspicion was seven or more positive answers, which was considered reasonable to discriminate suspicion of these disorders in a study conducted by Santos¹¹, with an urban population.

Two independent variables were considered. The DCM variable was measured by JCQ, in a version translated into Brazilian Portuguese, whose dimensions were: psychological demands (five items), job control (six items on skill discretion and three items on decision authority), and social support at work (three items on social support from colleagues and three items on social support from the supervisor). Questions were presented in an ordinal four-point Likert-type scale (“strongly disagree” to “strongly agree”).

It is worth mentioning that, in Brazil, a study concerning the JCQ performance showed it is a good instrument for identification of psychosocial aspects of work and its relation to the health-disease process¹².

Therefore, the scores obtained for each of the JCQ dimensions were initially categorized as “high” and “low,” using the mean as a cutoff point. After this procedure, the four possibilities of working experiences proposed by the model were obtained: low demand (high control and low demand); active work (high control and high demand); passive work (low control and low demand); and high demand (low control and high demand). Social support was used in the analysis of the complete DCM.

The exposure variable “effort–reward imbalance” was obtained from the ERI scale translated into Brazilian Portuguese, consisting of 23 questions on ordinal four-point scale (“strongly agree” to “strongly disagree”), which were also divided into three dimensions: effort (6 items), reward (11 items), and overcommitment (6 items). The three dimensions were dichotomized into “high” and “low,” with the mean as a cutoff point. The effort–reward imbalance index was obtained from the ratio $e/(r \cdot c)$, where “e” is the sum of the stress items, “r” corresponds to the score of reward items, and “c” is a correction factor, equivalent to the ratio of the number of items in the numerator compared with the denominator². The index score was categorized into tertiles (low, medium, and high imbalance). Overcommitment was included in the analysis of the complete ERI model.

Covariates considered in the analysis were sociodemographic (gender, age, number of children, marital status, educational level, and income), job characteristics (type of employment contract, weekly working hours, length of service in the health unit, labor rights, dual-employment situation, compatibility of activities performed, job satisfaction, household chores, and housework overload), and lifestyle (physical and leisure activities). Domestic overload (DO) was obtained by calculating: $DO = (\text{washing} + \text{ironing} + \text{cleaning} + \text{cooking}) \times (\text{number of residents} - 1)$ ¹³. The score obtained was categorized into tertiles.

The association between CMD and analysis models considered partial and complete DCM (with the inclusion of social support at work) and partial and complete ERI (with the inclusion of the overcommitment dimension). For the analysis of the combination of partial models, DCM scores were calculated from the ratio of the five questions of psychological demands and nine items of control over work (D/C). The ERI score was obtained by the calculation of effort and reward items, multiplied by a correction factor $[e/(r^*c)]$. In this respect, workers were initially classified as “exposed” and “unexposed,” from the dichotomous categorization of scores for each dimension of the models, using the mean as cutoff point for the DCM and scores equal to or less than one for the ERI model. The lowest values were defined as absence of exposure.

Data analysis involved description of absolute and relative frequencies of the variables of interest, overall prevalence estimate for CMD, and bivariate analysis. Breslow–Day test of homogeneity was performed, considering p -value ≤ 0.05 to classify a variable as an effect modifier. To evaluate the confounding, the backward method was applied, using the complete model and evaluating the effect of the removal of each variable. Variations above 10% were considered as confounding variables. The criterion for the maintenance of the covariates in the final model was p -value ≤ 0.05 . Prevalence ratios (PR) were obtained by applying the Poisson regression model with robust variance.

The research project was approved by the Research Ethics Committee of the *Universidade Estadual de Feira de Santana*, under the protocol number 081/2009. All stages of this study complied with Resolution No. 466/12 of the National Health Council, which handles the guidelines and regulatory standards of research with human beings.

RESULTS

The study population consisted of 2,532 workers. Most were female (79.3%), aged between 31 and 40 years (36.0%) with a mean age of 30.8 years (standard deviation [SD] ± 10.7), marital status as married/common-law marriage/consensual union (57.7%), secondary education (39.4%), brown skin color (56.0%), who performed physical (70.4%) and leisure (81.9%) activities. Domestic work was reported by 91.5% of workers, and 54.3% reported high or medium housework overload. With regard to the characteristics of the job, regular employment contract was reported by 70.4% of workers. The majority reported having a weekly workload of 40 hours (81.9%), holding only one employment contract (78.7%), having a length of service with the unit of up to 4 years (51.0%), being entitled to labor rights only partially (62.3%), and holding compatibility of activities with the job position (97.3%). Job satisfaction was reported by 73.9% of workers (Table 1).

With regard to the psychosocial characteristics of the work, high psychological demands (54.0%), low job control (59.4%), and high social support (54.2%) were predominant. Work configuration experienced by most workers was of high demand (32.5%). The majority reported low stress (63.3%), low reward (71.0%), and low overcommitment to work

Table 1. Sociodemographic characteristics of work and lifestyle of health workers, Bahia, 2012.

| Variables | Total | |
|--|-------|------|
| | n | % |
| Gender (N = 2,525) | | |
| Female | 2,003 | 79.3 |
| Male | 522 | 20.7 |
| Age (years) (N = 2,476) | | |
| 19 – 30 | 545 | 22.0 |
| 31 – 40 | 892 | 36.0 |
| 41 – 50 | 603 | 24.4 |
| 51 – 60 | 337 | 13.6 |
| ≥ 61 | 99 | 4.0 |
| Marital status (N = 2,522) | | |
| Married/common-law marriage/consensual relationship | 1,455 | 57.7 |
| Single | 791 | 31.4 |
| Divorced/separated/widowed | 276 | 10.9 |
| Educational level (N = 2,503) | | |
| Elementary school/Jr high school incomplete/complete | 101 | 4.0 |
| High school incomplete/complete | 985 | 39.5 |
| Certificate programs | 421 | 16.8 |
| Undergraduate school incomplete/complete | 627 | 25.0 |
| Graduate school/Masters | 369 | 14.7 |
| Income (minimum wages) (N = 1,889) | | |
| Up to 1* | 282 | 14.9 |
| 2 – 4 | 1,344 | 71.2 |
| 5 – 7 | 123 | 6.5 |
| ≥ 8 | 140 | 7.4 |
| Performs household chores (N = 2,483) | | |
| Yes | 2,271 | 91.5 |
| No | 212 | 8.5 |
| Housework overload (N = 2,442) | | |
| Low | 1,117 | 45.7 |
| Medium | 567 | 23.2 |
| High | 758 | 31.1 |
| Practice of physical activities (N = 2,506) | | |
| Yes | 1,765 | 70.4 |
| No | 741 | 29.6 |
| Leisure activities (N = 2,434) | | |
| Yes | 1,994 | 81.9 |
| No | 440 | 18.1 |

*Minimum wage was equivalent to R\$ 545.00 at the moment of the research.

(53.0%). Among the workers, 37.7% presented low effort–reward imbalance. Overall prevalence of CMD in the study population was 21.0%.

In the bivariate analysis, statistically significant association of CMD with high psychological demand (PR = 1.19), with low job control (PR = 1.37), and with low social support (PR = 1.50) was found. In the DCM, high strain was the experience of working with the highest association with the outcome (PR = 1.57).

With regard to the psychosocial aspects of work and DCM, after adjustment for confounders, the associations not only lost magnitude, but also statistical significance, except for social support at work (Table 2), which maintained its significance.

For the dimensions of the ERI model, the high effort (PR = 2.07) and the overcommitment (PR = 2.53) were positively associated with the outcome investigated. There was no association with the reward dimension (PR = 0.99). Groups of medium (PR = 1.51) and high (PR = 2.38) effort–reward imbalance were also associated with CMD, and remained statistically significant even after adjusting for confounders (Table 3).

If compared with ERI, DCM as well as its dimensions showed less association with the outcome.

Table 2. Crude and adjusted prevalence ratios of the association between psychosocial aspects of work, demand-control model, and common mental disorders in health workers, Bahia, 2012.

| Exposures | n | % | PR | 95%CI | PR* | 95%CI |
|------------------------------|-------|------|------|-------------|------|-------------|
| Psychological demand | | | | | | |
| Low | 1,115 | 18.9 | 1.00 | | 1.00 | |
| High | 1,302 | 22.6 | 1.19 | 1.01 – 1.39 | 1.18 | 0.97 – 1.44 |
| Control over work | | | | | | |
| Low | 1,387 | 23.9 | 1.37 | 1.16 – 1.62 | 1.16 | 0.94 – 1.43 |
| High | 950 | 17.4 | 1.00 | | 1.00 | |
| Social support at work | | | | | | |
| Low | 586 | 28.3 | 1.50 | 1.28 – 1.77 | 1.30 | 1.07 – 1.58 |
| High | 1,716 | 18.8 | 1.00 | | 1.00 | |
| Partial demand/control model | | | | | | |
| Low strain | 451 | 16.6 | 1.00 | | 1.00 | |
| Active work | 487 | 17.9 | 1.07 | 0.81 – 1.42 | 1.13 | 0.79 – 1.60 |
| Passive work | 611 | 20.8 | 1.25 | 0.96 – 1.61 | 1.12 | 0.81 – 1.55 |
| High strain | 751 | 26.2 | 1.57 | 1.24 – 2.00 | 1.31 | 0.97 – 1.77 |

*adjusted to income of up to two minimum wages, have children, not practicing physical activities, dissatisfaction at work, and housework overload.

PR: prevalence ratio; 95%CI: confidence interval of 95%.

Analysis of partial models showed that, for the DCM, only exposure in “social support at work” (PR = 1.26) was more strongly associated with the outcome if compared to the dimensions demand and control (PR = 1.18). For ERI, a similar result was found, that is, only exposure in the dimension of overcommitment (PR = 2.10) contributed to a higher prevalence ratio of CMD in relation to the dimensions effort and reward (PR = 1.44). The DCM and ERI model were positively associated with CMD, but gained strengthened association when adding the third dimension — social support at work (PR = 1.79) and overcommitment at work (PR = 3.51), respectively.

In the adjusted analysis, despite losing magnitude, these dimensions remained statistically associated with CMD (in the DCM/social support, PR = 1.41; and in ERI, overcommitment, PR = 2.63).

In combined models analysis (DCM and ERI), a stronger association was observed when both exposures were present (RP = 2.49 in the crude analysis and RP = 1.97 in the adjusted analysis), compared with only one exposure analyzed separately (exposure to DCM or ERI). Therefore, the combination of the two partial models showed an increase in the measure of association, keeping the statistical significance levels, even after adjustment. A better performance of the ERI model was observed (Table 4), as it presented prevalence ratios of greater magnitude than the DCM.

Table 3. Crude and adjusted prevalence ratios of the association between the dimensions of effort–reward imbalance model and common mental disorders in health workers, Bahia, 2012.

| Exposures | n | % | PR | 95%CI | PR* | 95%CI |
|--|-------|------|------|-------------|------|-------------|
| Effort | | | | | | |
| Low | 1,666 | 15.8 | 1.00 | | 1.00 | |
| High | 770 | 32.7 | 2.07 | 1.74 – 2.40 | 1.61 | 1.33 – 1.96 |
| Reward | | | | | | |
| Low | 1,715 | 21.2 | 0.99 | 0.83 – 1.17 | 0.96 | 0.77 – 1.20 |
| High | 698 | 21.3 | 1.00 | | 1.00 | |
| Overcommitment | | | | | | |
| No | 1,280 | 12.3 | 1.00 | | 1.00 | |
| Yes | 1,141 | 31.5 | 2.53 | 2.14 – 3.00 | 2.04 | 1.64 – 2.53 |
| Partial effort–reward imbalance model | | | | | | |
| Low imbalance | 744 | 12.1 | 1.00 | | 1.00 | |
| Medium imbalance | 567 | 18.3 | 1.51 | 1.16 – 1.96 | 1.65 | 1.18 – 2.30 |
| High imbalance | 792 | 32.2 | 2.38 | 2.13 – 3.31 | 2.32 | 1.68 – 3.22 |

*adjusted to income of up to two minimum wages, have children, not practicing physical activities, dissatisfaction at work, and housework overload.

PR: prevalence ratio; 95%CI: confidence interval of 95%.

DISCUSSION

This study enabled the identification of the profile of primary health-care workers, which comprises a relatively young population, mostly female, with only one employment contract, and short length of service with the unit — results that were similar to other studies^{14,15}.

The prevalence of CMD observed among workers was lower than those found in other studies conducted with health workers in Brazil¹⁶⁻¹⁸. Nevertheless, the magnitude of the outcome in this population should be highlighted, as it reached one in five workers, which confirms the need for intervention and monitoring of mental health in this group.

The outcome was associated with all dimensions of the DCM in the bivariate analysis; however, after adjustment for confounders, the association with demand and control lost statistical significance. CMD was also associated with two dimensions of the ERI (effort and overcommitment), with the highly demanding work, and with effort–reward imbalance, which is also similar to results found in other studies^{17,19,20}. Among the dimensions of the DCM, the psychological demand presented a weaker association with the outcome, as

Table 4. Crude and adjusted prevalence ratios of common mental disorders, according to complete and partial combined models of occupational stress, Bahia, 2012.

| Model | n | % | PR | 95%CI | PR* | 95%CI |
|--|-----|------|------|-------------|------|-------------|
| Demand–control (DC) e social support at work (SSW) | | | | | | |
| DC e SSW without exposure | 935 | 17.8 | 1.00 | | 1.00 | |
| Exposure only in DC | 611 | 21.1 | 1.18 | 0.96 – 1.46 | 1.09 | 0.86 – 1.38 |
| Exposure only in SSW | 212 | 22.6 | 1.26 | 0.95 – 1.69 | 1.11 | 0.79 – 1.56 |
| Exposure in DC e SSW | 320 | 31.9 | 1.79 | 1.45 – 2.21 | 1.41 | 1.09 – 1.82 |
| Effort–reward (ERI) and overcommitment (OC) | | | | | | |
| ERI and OC without exposure | 845 | 10.7 | 1.00 | | 1.00 | |
| Exposure only in OC | 371 | 22.4 | 2.10 | 1.60 – 2.70 | 1.70 | 1.20 – 2.42 |
| Exposure only in ERI | 357 | 15.4 | 1.44 | 1.05 – 1.97 | 1.32 | 0.89 – 1.96 |
| Exposure in OC and ERI | 693 | 37.4 | 3.51 | 2.82 – 4.36 | 2.63 | 1.98 – 3.50 |
| Combined model | | | | | | |
| ERI and DC without exposure | 717 | 13.4 | 1.00 | | 1.00 | |
| Exposure only in DC | 413 | 15.5 | 1.15 | 0.86 – 1.55 | 0.99 | 0.68 – 1.44 |
| Exposure only in ERI | 440 | 26.4 | 1.96 | 1.54 – 2.51 | 1.58 | 1.16 – 2.15 |
| Exposure in ERI and DC | 514 | 33.5 | 2.49 | 2.00 – 3.12 | 1.97 | 1.48 – 2.64 |

*adjusted to income of up to two minimum wages, have children, not practicing physical activities, dissatisfaction at work, and housework overload.

PR: prevalence ratio; 95%CI: confidence interval of 95%.

opposed to other findings¹⁶. With regard to ERI, the reward did not associate with CMD, which differs from results of other studies²⁰.

This result may be related to the nature of the work in health, in which health workers consider that, in addition to compensation, providing care, and satisfaction to the needs of the users are relevant rewards of their practice²¹. Moreover, being inserted in a context that enables the worker to feel recognized and able to perform his or her duties, so that they can use their potentialities, are also factors that influence the perception of being rewarded²².

In primary health care, many times workers face inadequate conditions to fully perform their jobs, either by problems in the structure of units or by institutional barriers that do not allow the continuity of the initial care provided, configuring this level of complexity as an “entrance door with no way out²³.” This uncertainty concerning the results of primary care may generate, despite the compensation, a perception that there is no reward at work. Notwithstanding, the finding on the lack of association between reward and CMD needs to be further investigated in future studies.

Regarding the performance of partial models, the ERI showed a stronger association with the outcome, especially in the most exposed category. It was in the complete ERI model, that is, with the inclusion of the overcommitment dimension, that a higher increase in the measure of association was observed.

Another important finding of the study is that the partial combined models performed better to predict the outcome when compared to their isolated use. This result corroborates the findings from other studies^{7,24-26}, which have shown the combination of models as better alternatives for analysis, as it better explains the association between stress at work and diseases, that is, considering different exposures allows overcoming the limitations of the isolated models.

Incorporation of the dimension “social support at work” to the DCM showed better predictive capability of the event when compared to the reduced model. This was a finding consistent with other studies that attributed the better performance of the partial model to the addition of this dimension^{8,26}. It is worth noting that social support is considered a psychosocial aspect responsible for moderating the negative impacts of stress and some authors advocate that its integration to the DCM results in better capability to predict health-related events^{4,27}.

Taking into account the specificities of the work in health, as always being a collective work, and with a high demand for interpersonal relationships, the contribution of this scale to explain the occurrence of CMD is clear.

Overcommitment was strongly associated with the outcome, and its integration to the reduced ERI model increased more than twice the extent of association. The overcommitment reveals lack of worker’s ability to respond to the demands in a more balanced manner and inability to establish some distance between personal and professional life^{28,29}.

Considering the main characteristic of the work process in primary health care, that is, the bond formation between the health team and the community³⁰, overcommitment to work can be highlighted as a characteristic definitely embedded in the reality of workers. Health professionals often end up getting emotionally involved while witnessing the suffering of the populations they serve³¹. Moreover, the quality assessment based on productivity, which is a characteristic of primary care, requires the additional involvement of the worker

with the tasks, leading to considerable workloads³². Studies have shown the association between overcommitment and mental diseases²⁰.

In this study, the performance of the ERI was higher than the DCM, being more strongly associated with CMD. Recent publications have shown ERI has satisfactory psychometric ability to measure psychosocial stress at work⁶. The model covers both concepts of demand and control proposed by Karasek¹ and includes, even briefly, elements of social interactions at work, handling issues related to reciprocity²⁸. Characteristics of current employment in the primary health care were also evidenced, which is constituted by rare chances of promotion in careers, scarce stability for high-level professionals, professional devaluation, and higher demand for quality, both in processes and products^{17,33}.

In this respect, DCM was a weak predictor of the outcome. The instrument, designed in the 1970s, was built to evaluate characteristics of industrial labor; although intended to evaluate all types of work, has limitations in the context of the work in health, which integrates services and is marked by complexity and own dynamic³⁴. Nevertheless, it is considered one of the reference models to measure psychosocial stress, being widely used in the literature. In this study, the increase in the magnitude of association in the combined model (DCM + ERI) shows that DCM contributes to a better identification of the effects of occupational stressors on mental health.

This study has limitations that should be highlighted. This is a cross-sectional study, and thus the possibility of reversed causality cannot be ruled out, that is, it is not possible to affirm whether it was the psychosocial stress at work which caused the CMD, or it was the opposite. Additionally, both the exposure and the outcome investigated are subjective phenomena, and thus difficult to measure. The studied outcome can be particularly susceptible to memory bias, as self-reporting of information in the past was required to its establishment. Another bias in which the study may have incurred is the situation of “healthy workers,” as the study investigated only workers who were actively performing their duties, not including those who might be in a leave because of work-related illness.

CONCLUSION

Results showed that both the investigated models were associated with CMD among health workers of primary health care. However, it was noted that the analysis of combined models showed better capability of predicting the outcome. Moreover, of the models reviewed in this study, ERI performed better especially after incorporation of the overcommitment to work, and was characterized as a powerful model in the analysis of occupational stress and its effects on mental health.

The results of this study strengthen initiatives of broader evaluations of events related to mental health, with the combined analysis of models that usually have been individually tested. This procedure offers the possibility of incorporating multiple dimensions to the study of the work–health relationship, approaching the concrete realities in which workers are involved in their daily work. Data also highlighted the importance of dimensions such as social support at work and health risks of overcommitment to work — aspects that should be objects of research and further investigation in future studies.

REFERENCES

1. Karasek, RA. Job demand, job decision latitude, and mental strain: implications for job redesign. *Adm Sci Q* 1979; 24(2): 285-308.
2. Siegrist J. Adverse health effects of high-effort/low-reward conditions. *J Occup Health Psychol* 1996; 1(1): 27-41.
3. Araújo TM, Graça CC, Araújo E. Estresse ocupacional e saúde: contribuições do Modelo Demanda-Controle. *Ciênc Saúde Coletiva* 2003; 8(4): 991-1003.
4. Johnson J. Collective control: strategies for the survival in the workplace. In: Johnson JV, Johansson G, editors. *The psychosocial work environment: work organization, democratization and health*. New York: Ed Baywood; 1991. p. 121-32.
5. Van Vegchel N, de Jonge J, Bosma H, Schaufeli W. Reviewing the effort-reward imbalance model: drawing up the balance of 45 empirical studies. *Soc Sci Med* 2005; 60(5): 1117-31.
6. Silva LS, Barreto, SM. Adaptação transcultural para o português brasileiro da escala effort-reward imbalance: um estudo com trabalhadores de banco. *Rev Panam Salud Publica* 2010; 27(1): 32-6.
7. Hoven H, Wahrendorf M, Siegrist J. Occupational position, work stress and depressive symptoms: a pathway analysis of longitudinal SHARE data. *J Epidemiol Community Health* 2015; 0: 1-6.
8. Griep RH, Rotenberg L, Landsbergis P, Vasconcellos-Silva PR. Uso combinado de modelos de estresse no trabalho e a saúde auto-referida na enfermagem. *Rev Saúde Pública* 2011; 45(1): 145-52.
9. Oliveira, AM. Estresse ocupacional e saúde psíquica dos trabalhadores do Distrito Sanitário Centro Histórico do município de Salvador [dissertação de mestrado]. Salvador: Faculdade de Medicina da Universidade Federal da Bahia; 2013.
10. Santos KO, Araújo TM, Oliveira NF. Estrutura fatorial e consistência interna do Self-Reporting Questionnaire (SRQ-20) em população urbana. *Cad Saúde Pública* 2009; 25(1): 214-22.
11. Santos KO, Araújo TM, Pinho PS, Silva AC. Avaliação de um instrumento de mensuração de morbidade psíquica: estudo de validação do Self-Reporting Questionnaire (SRQ-20). *Rev Baiana Saúde Pública* 2010; 34(3): 544-60.
12. Araújo TM, Karasek R. Validity and reliability of the job content questionnaire in formal and informal jobs in Brazil. *Scand J Work Environ Health Suppl*. 2008; (6): 52-9.
13. Aquino EM. Gênero, trabalho e hipertensão arterial: um estudo de trabalhadoras de enfermagem em Salvador, Bahia [tese de doutorado]. Salvador: Instituto de Saúde Coletiva da UFBA; 1996.
14. Dilélio AS, Facchini LA, Tomasi E, Silva SM, Thumé E, Piccini RX, et al. Prevalência de transtornos psiquiátricos menores em trabalhadores da atenção primária à saúde das regiões Sul e Nordeste do Brasil. *Cad Saúde Pública* 2012; 28(3): 503-14.
15. Costa SM, Prado MC, Andrade TN, Araújo EP, Silva Junior WS, Gomes Filho ZC, et al. Perfil do profissional de nível superior nas equipes da Estratégia Saúde da Família em Montes Claros, Minas Gerais, Brasil. *Rev Bras Med Fam Comunidade* 2013; 8(27): 90-6.
16. Araújo TM, Aquino E, Menezes G, Santos CO, Aguiar L. Aspectos psicossociais do trabalho e distúrbios psíquicos entre trabalhadoras de enfermagem. *Rev Saúde Pública* 2003; 37(4): 424-33.
17. Braga LC, Carvalho LR, Binder MC. Condições de trabalho e transtornos mentais comuns em trabalhadores da rede básica de saúde de Botucatu (SP). *Ciênc Saúde Coletiva* 2010; 15(suppl 1): 1585-96.
18. Carvalho CN, Melo-Filho DA, Carvalho JA, Amorim AC. Prevalência e fatores associados aos transtornos mentais comuns em residentes médicos e da área multiprofissional. *J Bras Psiquiatr* 2013; 62(1): 38-45.
19. Gomes DJ, Araújo TM, Santos KO. Condições de trabalho e de saúde de trabalhadores em saúde mental em Feira de Santana, Bahia. *Rev Baiana Saúde Pública* 2011; 35(suppl 1): 211-30.
20. Souza SF, Carvalho FM, Araújo TM, Porto LA. Desequilíbrio esforço-recompensa no trabalho e transtornos mentais comuns em eletricitistas de alta tensão. *Rev Baiana Saúde Pública* 2011; 35(1): 83-95.
21. Barra SA. O acolhimento no processo de trabalho em saúde. *Serv Soc Rev* 2011; 13(2): 119-42.
22. Ramos BS, Ferreira CL. O aumento da produtividade através da valorização dos colaboradores: uma estratégia para a conquista de mercado. *Rev Eng Tecnol* 2010; 2(2): 71-80.
23. Böing E, Crepaldi MA. O psicólogo na atenção básica: uma incursão pelas políticas públicas de saúde brasileiras. *Psicol Ciênc Prof* 2010; 30(3): 634-49.
24. Calnan M, Wadsworth E, May M, Smith A, Wainwright D. Job strain, effort-reward imbalance, and stress at work: competing or complementary models? *Scand J Public Health* 2004; 32(2): 84-93.
25. De Jonge J, Bosma H, Peter R, Siegrist J. Job strain, effort-reward imbalance and employee well-being: a large-scale cross-sectional study. *Soc Sci Med* 2000; 50(9): 1317-27.

26. Yu SF, Nakata A, Gu GZ, Swanson NG, Zhou WH, He LH, et al. Co-effect of Demand-control-support model and Effort-reward Imbalance model on depression risk estimation in humans: findings from Henan Province of China. *Biomed Environ Sci* 2013; 26(12): 962-71.
27. Dollard MF, Winefield HR, Winefield AH, De Jonge J. Psychosocial job strain and productivity in human service workers: A test of the demand-control-support model. *J Occup Orga Psychol* 2000; 73: 501-10.
28. Vasconcelos EF, Guimarães LA. Esforço e recompensa no trabalho de uma amostra de profissionais de enfermagem. *Psi inForm* 2009; 13(13): 11-36.
29. Siegrist J, Starke D, Chandola T, Godin I, Marmot M, Niedhammer I, et al. The measurement of effort-reward imbalance at work: European comparisons. *Soc Sci Med* 2004; 58(8): 1483-99.
30. Monteiro MM, Figueiredo VP, Machado MF. Formação do vínculo na implantação do Programa Saúde da Família numa Unidade Básica de Saúde. *Rev Esc Enferm USP* 2009; 43(2): 358-64.
31. Scholze AS, Duarte Junior CF, Silva YF. Trabalho em saúde e a implantação do acolhimento na atenção primária à saúde: afeto, empatia ou alteridade? *Interface Comun Saúde Educ* 2009; 13(31): 303-14.
32. Daubermann DC, Tonete VL. Qualidade de vida no trabalho do enfermeiro da Atenção Básica à Saúde. *Acta Paul Enferm* 2012; 25(2): 277-83.
33. Paim, JS. Gestão da atenção básica nas cidades. In: Neto ER, Bógus, CM, editores. *Saúde nos aglomerados urbanos: uma visão integrada*. Brasília: Organização Pan-Americana da Saúde; 2003. p. 183-210.
34. Pierantoni CR, Varella TC, França T. Recursos humanos e gestão do trabalho em saúde: da teoria para a prática. In: Ministério da Saúde. *Organização Pan-Americana da Saúde. Observatório de Recursos Humanos em Saúde no Brasil: estudos e análises*. Brasília: Ministério da Saúde; 2004. p. 51-80.

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