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Assessment of occupational stress and associated factors among bank employees in Vitoria, State of Espírito Santo, Brazil

Glenda Blaser Petarli [1]
Eliana Zandonade [1]
Luciane Bresciani Salaroli [1]
Nazaré Souza Bissoli [1]

Abstract *Occupational stress has become a major cause of illness and a major risk to the psychological and social well-being of workers. In this context, the aim of this study was to estimate the prevalence of occupational stress in employees of a banking network in the municipal region of Vitória, state of Espírito Santo, and its association with sociodemographic variables and work characteristics. This cross-sectional study involved 525 bank employees. Occupational stress was evaluated using the short version of the Job Stress Scale. A multivariate analysis was conducted to evaluate the association between the Karasek quadrants and the independent variables. It was found that most bank employees belonged to the "passive jobs" quadrant (34.4%, n = 179) and were considered to have an intermediate risk of occupational stress. Considering the "low demand jobs" category as the standard, the increased risk of stress was associated with low education levels (odds ratio, 3.69, 95% CI, 1.64–8.28), working in bank agencies (odds ratio, 2.55, 95% CI, 1.36–4.77), a length of employment at the bank of more than five years (odds ratio, 3.32, 95% CI, 1.89–5.81), a daily work period of six hours (odds ratio, 2.72, 95% CI, 1.27–5.81), and, mainly, low social support (odds ratio, 2.57, 95% CI 1.45– 4.56).*

Key words *Psychological stress, Occupational health, Professional exhaustion*

[1] Centro de Ciências da Saúde, Universidade Federal do Espírito Santo. Av. Marechal Campos 1468, Maruípe. 29043-900 Vitória ES Brasil.
glenda.petarli@gmail.com

Introduction

The processes of productive restructuring and globalization of the market economy have caused significant changes in the organization and management of labor[1]. In the banking sector, these processes have been consolidated through a combination of factors, including mass layoffs, automation, outsourcing, business re-engineering with the reduction of the hierarchical levels, job insecurity, and multifunctional tasks[2].

All of these transformations have a significant impact on working conditions, employment, and wages[3] and directly affect the health of bank workers[4]. Occupational stress has become a major cause of diseases[5]; it is an important risk factor for the psychological and social well-being of workers and directly affects their health and the quality of their affective, social, and professional life, leading to low work performance, high turnover, absenteeism, and violence at work[6].

Factors in the work environment associated with occupational stress include labour organization and management, labour systems, and the quality of human relations[7]. The main organizational stressors identified in the literature include problems of physical origin such as noise, ventilation, and lighting in the workplace; psychosocial stressors associated with work functions, interpersonal relations, and autonomy/control of the execution of tasks; and factors associated with career development[8]. Due to this diversity of factors, several approaches , including those proposed by Siegrist[9] and Lipp[10] and the demand-control model developed by Robert Karasek[11], can be used to study occupational stress. The latter has been widely used, and it has provided an important comparative basis for studies in the health- and work-related fields[12] and essential elements for interventions in major international policies on occupational stress[13].

In this context, the aim of the present study was to estimate the prevalence of occupational stress in bank employees in the metropolitan region of Vitória, state of Espírito Santo, Brazil, and its association with socioeconomic, demographic, and labour characteristics.

Methods

This cross-sectional and observational study derived data from another study, which investigated metabolic syndrome, insulin resistance, and associated factors in bank employees[14]. The study sample included employees of a banking network in the state of Espirito Santo, aged 20–64 years, of both sexes, who worked in the metropolitan region of Victoria and were in full labour activity. Data were collected between August 2008 and August 2009.

To calculate the sample size, all of the 1410 bank employees of the institution at which the study was conducted were considered the study population. The expected prevalence of occupational stress was approximately 50%[15] (considering the increased and more harmful exposure levels to stress of high demand and passive jobs). The significance level was set at 5%, the sampling error was equal to 6%, and the design effect was equal to two (effect of conglomerate bank agencies). The calculations were performed with EpiData software version 4.0 using a formula to estimate prevalence. The minimum size of the calculated sample was 450 employees. To compensate for potential losses, all bank employees randomly selected for the original project were considered.

The sociodemographic variables analysed included sex, age, education, ethnicity, socioeconomic status, and marital status. The socioeconomic status was established according to the Brazilian economic classification criteria[16].

The work characteristics included place of work, job position, length of employment at the bank, length of employment in the current position, and daily work hours. For work-related data, the variable "job position" was dichotomized into "bank agency" and "administrative unit". Individuals in the category "bank agency" included those working in bank branches in cashier and management positions. Employees in the category "administrative unit" included those who performed administrative and general management functions and conducted their activities without direct contact with the public, i.e., in administrative units detached from bank agencies.

In the original study, all variables were collected using a structured questionnaire administered by trained interviewers.

To evaluate occupational stress, the short version of the Job Stress Scale[17] was used, which was adapted for the Brazilian market and developed on the basis of the demand-control model[18]. According to Karasek, activities involving high psychological distress and low control generate increased occupational stress in workers and promote physical and psychological illnesses[19]. The situations that combine low-demand and low-control jobs (passive jobs) are also harmful because they can generate disaffections and loss

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of skills[17]. The quadrants associated with lower risk to workers' health are related to active and low-demand jobs[19].

The short version of the Job Stress Scale comprised 17 questions, including five questions regarding psychological demands (range of five to 20 points), six questions regarding the control over work activities (range of six to 24 points), and six questions regarding social support (range of six to 24 points). Each variable generated a score by adding the points assigned to each question, and this score was dichotomized into "low" and "high" categories according to the median.

Subsequently, these groups were combined to define the four quadrants of the demand-control model: high distress (high-demand and low-control jobs, corresponding to the quadrant with higher exposure to occupational stress), passive job (low-demand and low-control jobs), active job (high-demand and high-control jobs), and low distress (low-demand and high-control jobs, considered the ideal working condition).

For the definition of social support, the median scores of this variable were calculated and later categorized into "high" and "low" groups. This variable was evaluated with the group of variables related to work characteristics.

Data were organized and analysed using the Statistical Package for the Social Sciences® (SPSS) software version 18.0 for Windows. To determine possible associations between occupational stress (considering its four quadrants) and the other variables, the chi-square test was used. In the case of statistical significance of up to 10% in the chi-square test, odds ratios adjusted by the multiple logistic regression model were calculated, considering the low-demand jobs as the standard. The adjusted odds ratios were separately calculated for the categories "active jobs", "passive jobs", and "high-demand jobs". The final level of significance was set at 5%.

This study was approved by the Research Ethics Committee of the Health Sciences Centre of the Federal University of Espírito Santo to complement the original study.

Results

Of the 525 bank employees invited to participate in the study, 521 (99.3%) completed all questionnaires and were included in the analyses.

The overall score of the variable "psychological distress" varied between five and 20, with a median of 15, and the variable "control" varied between six and 24, with a median of 17. The classification of employees on the basis of their level of exposure to occupational stress according to the demand-control model indicated that most workers were classified in the "passive" quadrant (34.4%, n = 179), which is considered a category with intermediate exposure to occupational stress, followed by the "low distress" quadrant (26.3%, n = 137), and "active" quadrant (20.5%, n = 107). The quadrant, considered at higher risk for occupational stress, had the lowest number of individuals (18.8%, n = 98).

Table 1 shows the absolute and percentage values of socioeconomic and demographic variables for the total sample and for each Karasek quadrant. The results indicated a balance between the sexes, with 51.4% (n = 268) of male bank employees, a predominance of subjects aged between 30 and 50 years (61.6%, n = 321), and a predominance of subjects with a high level of education, with 74.1% (n = 386) having a university or post-graduate degree. Most bank employees were married or lived with a partner (64.3%, n = 335) and belonged to socioeconomic class A or B (55%, n = 289). With regard to ethnicity, 58% (n = 302) were Caucasian. The level of education (p = 0.001), socioeconomic status (p = 0.008), and marital status (p = 0.015) were significantly associated with the quadrants.

With regard to the work characteristics (Table 2), 55% (n = 236) of the employees worked in administration units, and the majority (73%, n = 381) had worked at the bank for more than five years. In contrast, only 43% (n = 222) reported working in the present function for more than five years. Of the total population, 59% (n = 309) worked more than six hours daily, and 66% (n = 343) lived in the same city where they worked. Low social support was reported by 52% (n = 269) of the respondents. Significant differences were observed between the Karasek quadrants and the variables "job position" (p = 0.001), "length of employment" (p = 0.038), "daily working hours" (p = 0.001), and "social support" (p = 0.001).

Table 3 shows the results of multiple logistic regressions using the variables associated with the Karasek quadrants in the bivariate analysis. The odds ratios for the categories "active", "passive", and "high distress" were calculated and compared with the "low distress" category. The variables associated with the Karasek quadrants were education, marital status, job position, daily working hours, length of employment, and social support.

Table 1. Absolute and percentage values of sociodemographic variables for the total sample and Karasek quadrants according to the demand-control model for bank employees in the municipal region of Vitória, state of Espírito Santo, Brazil.

Categoria	Quadrants of the demand-control model										
	Total		Low Distress		Active		Passive		High Distress		p-value*
	n	%	n	%	n	%	n	%	n	%	
Sex											0.164
Female	253	49%	60	44%	49	46%	99	55%	45	46%	
Male	268	51%	77	56%	58	54%	80	45%	53	54%	
Age group											0.121
≤ 30 years	95	18%	27	20%	11	10%	43	24%	14	14%	
30–50 years	321	62%	83	61%	74	69%	102	57%	62	63%	
≥ 50 years	105	20%	27	20%	22	21%	34	19%	22	22%	
Education											0.001**
Elementary and secondary education	135	26%	21	15%	16	15%	68	38%	30	31%	
University degree	261	50%	74	54%	56	52%	88	49%	43	44%	
Postgraduate degree	125	24%	42	31%	35	33%	23	13%	25	26%	
Ethnicity											0.159
Caucasian	302	58%	88	64%	66	62%	95	53%	53	54%	
Others	219	42%	49	36%	41	38%	84	47%	45	46%	
Socioeconomic class											0.008**
A + B	289	55%	77	56%	73	68%	85	47%	54	55%	
C + D	232	44%	60	44%	34	32%	94	53%	44	45%	
Marital status											0.015**
Married or living with a partner	335	64%	95	70%	74	69%	96	54%	70	17%	
Single	126	24%	26	19%	23	21%	60	34%	17	71%	
Separated, divorced, or widower	59	11%	15	11%	10	9%	23	13%	11	11%	

* Chi-square test. ** $p < 0.05$.

In the group of socioeconomic variables, low education increased the likelihood that the employees belonged to the "passive" quadrant by 3.6-fold (95% CI, 1.64–8.28). Being married or living with a partner decreased the likelihood of belonging to the "active" quadrant (odds 0.46, 95% CI, 0.22–0.29) or the "passive" quadrant (odds 0.35, 95% CI, 0.18–0.69). Similarly, being separated, divorced, or widowed decreased the likelihood of belonging to the "active" quadrant (odds 0.34, 95% CI, 0.11–1.00).

With regard to work characteristics, working in bank agencies increased the likelihood of belonging to the "high distress" quadrant by 2.55-fold (95% CI, 1.36–4.77) and increased the likelihood of belonging to the "active" quadrant by 2-fold (95% CI, 1.10–3.68). Individuals working in the bank for more than five years had a 3.32-fold (95% IC 1.89–5.81) increased likelihood of belonging to the "passive" quadrant compared with those employed for less than five years. With regard to daily working hours, a work period of up to six hours a day increased the likelihood of belonging to the "active" quadrant. Low social support increased by more than 2-fold the likelihood of belonging to the "high distress" quadrant (95% CI, 1.45–4.56) or the "active" quadrant (95% CI, 1.25–3.71) but was not associated with the "passive" quadrant.

Discussion

In the present investigation, it was found that a greater number of bank employees (n = 179, 34.5%) were in the "passive" quadrant; although passive jobs are harmful to the health of workers[19], they are considered to have an intermedi-

Table 2. Absolute and percentage values of work variables for the total sample and Karasek quadrants according to the demand-control model for bank employees in the municipal region of Vitória, state of Espírito Santo, Brazil.

Variable	Quadrants of the demand-control model										
	Total		Low Distress		Active		Passive		High Distress		p-value*
	n	%	n	%	n	%	n	%	n	%	
Job position											0.001**
Administrative unit	285	55%	94	69%	59	55%	93	52%	39	40%	
Bank agency	236	45%	43	31%	48	45%	86	48%	59	60%	
Length of employment in the current position											0.103
≤ 5 years	299	57%	89	65%	53	50%	103	58%	54	55%	
> 5 years	222	43%	48	35%	54	50%	76	42%	44	45%	
Length of employment in the bank											0.038**
≤ 5 years	140	27%	42	31%	18	17%	57	32%	23	23%	
> 5 years	381	73%	95	69%	89	83%	122	68%	75	77%	
Daily work hours											0.001**
≤ 6 hours	212	41%	38	28%	20	19%	110	61%	44	45%	
> 6 hours	309	59%	99	72%	87	81%	69	39%	54	55%	
Residence in the city of employment											0.485
Yes	343	66%	84	61%	73	68%	117	65%	69	70%	
No	178	34%	53	39%	34	32%	62	35%	29	30%	
Social support											0.001**
Low	269	52%	61	45%	69	64%	72	40%	67	68%	
High	252	48%	76	55%	38	36%	107	60%	31	32%	

* Chi-square test. ** $p < 0.05$.

ate risk of stress. A study conducted by Silva and Barreto[15] involving 2,500 employees of a Brazilian banking network found a predominance of bank employees in the "low distress" quadrant (n = 672, 32.7%), followed by the "high distress" quadrant (n = 672, 32.7%), and "active" quadrant (n = 300, 14.6%). The "passive" quadrant contained the smallest number of employees (n = 300, 14.6%).

Compared with other professional categories, passive jobs were also prevalent among nursing professionals[6,20,21], technical and administrative employees[22], employees of multinational companies from Malasia[23], and hospital surgeons in Germany[24].

The negative effect of passive jobs occurs because these jobs combine low psychological distress and low control, which could lead to a gradual decrease in learning and development of skills. The lack of challenges at work and the strict restrictions that prevent workers from using their own ideas to improve the working process culminate in extreme discouragement, dissatisfaction, and decreases in productivity in the long term[19].

In the present study, the quadrant considered at greater risk for occupational stress (high distress) contained the lowest number of employees. These results were different than expected, considering that the current reality of banking activities, characterized by stringent targets, fierce competition, decreased job availability, demands for constant qualification, intensification and overload of tasks, and increased control and pressure on workers[4,25], can increase the risk of occupational stress in this professional category.

It should be noted that the control-demand model assesses the risk of stress, focusing on labour organization processes[17], and does not take into account other important aspects in the development and perception of occupational stress, which may have limited the performance of a broader evaluation of the stress level in the study population. It should also be noted that the present study only reflects the reality of a banking

Table 3. Multiple logistic regressions, considering the variables associated with the Karasek quadrants according to the demand-control model and the "low-distress" category as the standard for bank employees in the municipal region of Vitória, state of Espírito Santo, Brazil.

Variable	Quadrantes do modelo demanda-controle											
	Active				Passive				High-distress jobs			
	p-value	OR	LL 95% CI	UL 95% CI	p-value	OR	LL 95% CI	UL 95% CI	p-value	OR	LL 95% CI	UL 95% CI
Education												
Elementary and secondary education	0.736	0.85	0.35	2.07	**0.002**	**3.69**	**1.64**	**8.28**	0.41	1.43	0.60	3.43
University degree	0.771	0.91	0.48	1.70	0.252	1.45	0.76	2.78	0.27	0.68	0.34	1.36
Postgraduate degree		1				1				1		
Marital status												
Married or living with a partner	**0.047**	**0.46**	**0.22**	**0.99**	**0,002**	**0.35**	**0.18**	**0.69**	0.735	0.87	0.39	1.95
Separated, divorced, or widower	**0.051**	**0.34**	**0.11**	**1.00**	0.143	0.50	0.20	**1**.27	0.526	0.70	0.23	2.12
Single		1.00				1.00				1.00		
Socioeconomic class												
C + D + E	0.111	1.58	0.90	2.78	0.761	1.08	0.66	1.78	0.727	1.11	0.63	1.95
A + B		1.00				1.00				1.00		
Job position												
Bank agency	**0.023**	**2.01**	**1.10**	**3.68**	0,475	1.22	0.70	2.13	**0.003**	**2.55**	**1.36**	**4.77**
Administrative unit		1.00				1.00				1.00		
Length of employment in the bank												
≤ 5 years	0.191	0.63	0.32	1.26	**0.000**	**3.32**	**1.89**	**5.81**	0.069	1.80	0.95	3.41
> 5 years		1.00				1.00				1.00		
Daily work hours												
≤ 6 hours	**0.010**	**2.72**	**1.27**	**5.81**	0.169	1.59	0.82	3.06	0.228	1.58	0.75	3.32
> 6 hours		1.00				1.00				1.00		
Social support												
Low	**0.006**	**2.16**	**1.25**	**3.71**	0.497	0.84	0.51	1.39	**0.001**	**2.57**	**1.45**	**4.56**
High		1.00				1.00				1.00		

LL: Lower limit. UL: Upper limit. OR: Odds ratios. In bold: statistically significant values.

network, and consequently the manner in which it organizes its labour processes, which limits the generalization of these findings.

The analysis of the sociodemographic variables after logistic regression indicated that being married or living with a partner, compared to being single, decreased the risk of belonging to the intermediate categories of occupational stress, which reinforces the hypothesis that the support of fellow workers can mitigate stress[26]. Therefore, the family structure should serve as social support and can stimulate the perception of individuals regarding environmental stressors[27]. Nevertheless, in the present study, being separated or divorced decreased the likelihood of belonging to the "active" quadrant.

In the group of sociodemographic variables, having completed only elementary or secondary education increased the likelihood of belonging to the "passive" quadrant by more than 3-fold. Similar results were found by other authors working with nursing professionals[20,28].

These findings can be understood with respect to productive changes in the banking sector, which led to an increase in the required education level for certain categories, with consequent disqualification of employees with low education levels[29]. Because a low level of education is associated with low control over the activities developed in the work environment[6], this marginalization may have decreased the number of job assignments for these professionals and may have contributed to the decreased control over the execution of these assignments, which could justify the results obtained.

With regard to work characteristics, working in bank agencies proved to be a risk factor for occupational stress and increased the likelihood

of belonging to the "high distress" and "passive" categories. It should be noted that the agencies of the bank network evaluated have a prevalence of workers with managerial and cashier functions. Despite being inherent to all banking professionals, these functions are characterized by more direct contact with the public, greater exposure to the risk of robbery, insults and physical abuse, and the need to address the problems and difficulties of the account holders[30,31]. In addition, the marketing strategies of the banks impose targets on these workers that are generally set by higher hierarchical levels and are often considered unattainable. These tasks include the need to sell financial products, which considerably increases the pressure imposed on these workers, who do not always despite all the demands to be met, have sufficient control over the execution of the work[30,31].

In the case of managers, greater control over work processes increases their burdens, responsibilities, and, consequently, their emotional distress[32]. Therefore, freedom derived from increased control, accompanied by the great demands to which managers are subjected, can serve as stressors and not as a satisfaction factor at work[33].

Greater length of employment in the bank increased the risk of belonging to the "passive" quadrant compared to the "low distress" quadrant by 3.31-fold. It was expected that a longer length of employment would result in a greater learning process, and this would make the professional better prepared to perform their tasks[34], consequently minimizing the chances of belonging to a quadrant that was harmful to their health, such as the "passive" quadrant. However, the constant incorporation of new technologies in banking activities and the hiring of employees who are more qualified cause disqualification of employees with a greater length of employment, who find it difficult to adjust to these changes, both at the technological level and in terms of performance of their duties[32], and could make them more distressed and more susceptible to stress, as demonstrated in the results.

With regard to daily work hours, a work period of up to six hours increased the likelihood of belonging to the "active" quadrant. One should consider that the higher susceptibility to stress in this group compared with the "low distress" quadrant may be due to the absence of breaks or very little time to rest during the workday. According to Karasek and Theorell[19], these intervals promote freedom of action and ease tensions during the workday. Nevertheless, a work period of up to six hours did not increase the risk of belonging to the "high distress" and "passive" quadrants, which are considered the most harmful to employees' health compared to the other categories.

The influence of the workload in the development of stress may also be related to the characteristics of the duties performed by employees who work up to six hours; however, this aspect was not evaluated in the present study.

The important role of social support, considered the most well known situational variable against occupational stress[35], was evident in the present study. Low social support increased the likelihood of belonging to the "high distress" quadrant by 2.55-fold. The predictive ability of this variable in reducing occupational stress is also consistent with the results of other studies[6,20,36].

Social integration, confidence in peers, and support by colleagues and superiors in the performance of tasks, which are found in situations of high social support, can protect the health of workers against the effects of occupational stress[37] and therefore serve as an important strategy in reducing the perception of stress levels. In fact, higher concentrations of cortisol, the hormone released during stress, were found in women with low social support[38], and this result strengthens the evidence of the protective effect of social support.

A study conducted by Noblet et al.[39] revealed that not all sources of social support are predictors of the reduction of occupational stress. Although family and friends can provide valuable emotional support to help the individual to cope with the most demanding periods, only superiors, co-workers, and subordinates can qualify workers or provide the necessary assistance to effectively decrease the workload. These data are in contrast to those of Sargent and Terry[40], who suggested that different sources of social support, including support obtained outside the work environment, are important in mitigating the negative effects of high-stress jobs.

The cross-sectional design of the present study is a possible limitation, as it does not allow the establishment of temporal correlations between the events studied. In addition, in the statistical analysis, the odds ratios were calculated but were not suitable for a cross-sectional study. Nevertheless, this measure is considered the best approximation of risk in this type of study for the outcome evaluated. The present study was con-

ducted with workers of a particular banking network; consequently, the generalization of these findings to other employees of the financial sector or other professional categories is limited. In addition, the demand-control model used herein to evaluate stress focused predominantly on the manner in which work is organized and did not address all aspects related to the production of occupational stress. Therefore, in view of the complex and subjective reality of the perception of stress, its understanding can be expanded with the use of methodologies that assess occupational stress that consider the influence of other variables, including individual characteristics, somatic and psychological symptoms, and the relationship between the efforts made in the development of work functions and the rewards received[10,41,42]. The evaluation of subjective questions should also be considered, and the use of qualitative methodologies, including individual interviews and focal groups[33], may be of great value.

Final considerations

In the present study, a predominance of bank employees in the "passive" quadrant was observed, which is considered harmful to the health of workers. In addition, this study strengthened the evidence of the association between sociodemographic variables and work characteristics by evaluating occupational stress according to the demand-control model. Considering the "low distress" category as the standard, the variables associated with the quadrants that generate increased risk of occupational stress were low education levels, working in bank agencies, length of employment at the bank of more than five years, daily work shifts of six hours, and especially low social support. Being married, living with a partner, and being separated, divorced, or widowed were associated with a lower risk of occupational stress compared with being single.

The findings of the present study can serve as a theoretical basis for the proposal of organizational strategies aimed at minimizing occupational stress and its impact on workers' health. It is essential that these strategies are based on the restructuring of processes to promote, wherever possible, the autonomy of the employees, the absence of contradictory demands, balance in the volume of tasks to be performed, and, indispensably, the strengthening of social support in the workplace.

Collaborations

GB Petarli participated in the study design, data analysis and interpretation, and manuscript preparation. LB Salaroli and E Zandonade participated in the study design, data analysis and interpretation, and critical review. NS Bissoli participated in the study design, research, and critical review.

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