

Depressive symptoms and psychosocial aspects of work in bank employees

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Background	The financial sector has seen an increase in the number of cases of violence and stress, which can result in adverse health outcomes, including depressive symptoms, but studies related to stress at work and depression for these workers are scarce.
Aims	To investigate the association between exposure to psychosocial work stressors and depressive symptoms in bank employees.
Methods	A self-administered questionnaire was completed by a sample of bank employees in Pará and Amapá, Brazil. The survey assessed sociodemographic characteristics, mental health (Patient Health Questionnaire-9), Demand–Control–Support and Effort–Reward Imbalance (ERI). Outcomes included two levels of depressive symptoms: major depressive symptoms (MDS) and other forms of depressive symptoms (ODS). Logistic regression models were used to estimate associations between depressive symptoms, the two job stress models and relevant covariates.
Results	Of 2806 eligible subjects, there were 1445 respondents (52% response rate) and the final analyses included 1046 participants. The overall prevalence of depressive symptoms was 32% (MDS = 18%; ODS = 14%), with no statistically significant difference between men and women. High demands, low levels of control and low social support were associated with MDS and/or ODS, adjusted for gender, age and other work-related conditions. High effort/low reward, over-commitment and ERI were also associated with MDS and ODS.
Conclusions	Psychosocial conditions in banking activity involving high strain, low social support at work, high effort with low reward and over-commitment may represent possible risk factors for depressive symptoms in bank employees.
Key words	Banking working; cross-sectional studies; depressive symptoms; mental health; psychosocial work stressors; working conditions.

Introduction

Competitiveness, productive restructuring and down-sizing as a consequence of globalization contribute to potentially stressful conditions at work [1]. The financial sector was particularly affected by these changes, which have resulted in an increase in the number of cases of violence and stress [2].

Chronic work-related stress has been associated with adverse physical and mental health outcomes [3],

including depression [4]. Depression is a recurrent, chronic disease [5] that often leads to long periods of disability, along with an increased risk of suicide [6].

Two theoretical models have been used to investigate psychosocial work conditions [4]: the Job Demand–Control–Support model (JDCS) [7] and the Effort–Reward Imbalance (ERI) at work model [3]. The JDCS [7] posits an interaction between psychological job demands and control of the work process, with social support at work acting as a protector or moderator of the

effects of job strain on health. In the ERI model [3], an imbalance between the expenditure of high effort at work and low rewards may affect health, with over-commitment at work (ERI-OC) contributing to a higher risk to health. The use of both models has improved the prediction of outcomes such as depression [8–11], however, most of these studies were conducted in economically developed countries. Research on stress models and association with depression among bank employees is scarce. So far, only one study carried out in a financial institution assessed minor psychiatric disorders among their employees using both models, JDCS and ERI [12].

This study aimed to investigate the association between psychosocial conditions in banking work, as assessed by the JDCS and ERI-OC models, with major depressive symptoms (MDS) and other forms of depressive symptoms (ODS), in a single sample, from the economically less favoured areas of Pará and Amapá (PA-AP) in northern Brazil, among employees of financial institutions. Brazil, the seventh largest economy in the world [13], has significant socioeconomic inequalities, with evidence for low Human Development Index scores in the north and northeast regions [13]. This is the first study in Brazil to use both stress models to analyse the psychosocial conditions of financial activity with two levels of depressive symptoms as the outcome.

Methods

A cross-sectional study of bank employees from PA-AP, Brazil was conducted between 2012 and 2013. According to the Union of Bank Employees of PA-AP, there are 7697 employees in these states (unpublished data). The Union provided a list of 3363 employees with a registered e-mail address. Eligible individuals were employees invited to participate through their e-mail addresses, aged ≥ 18 –66 years and with 1–30 years of work if male or aged ≥ 18 –61 years and with 1–25 years of work if female. In case of non-response by e-mail, a second attempt was made to deliver the questionnaires in person for those who did not answer the e-mail invitation. Once the questionnaires were completed, they were collected by a team in each state. We excluded those who had retired or were near retirement age. In Brazil, retirement requirements differ for men and women: men must be aged ≥ 70 years or have worked for ≥ 35 years; women must be aged ≥ 65 years or have worked ≥ 30 years. Those who were either on temporary or permanent leave and receiving sickness benefits (in Brazil, when sickness leave is >15 days), or absent for personal reasons, were excluded. A sample of 2000 individuals was estimated assuming a prevalence of depressive symptoms of approximately 25% with a 95% confidence interval (CI) of 2%. Informed consent was obtained from all participants. This study was approved by the Research Ethics Committee Involving Humans of

the Faculty of Medicine-University of São Paulo within the standards required by the Helsinki Declaration.

Data were obtained via a self-administered questionnaire that assessed sociodemographic and work characteristics, depressive symptoms using the Patient Health Questionnaire-9 (PHQ-9) [14], in Portuguese translation, and psychosocial aspects of the work environment. The psychometric properties of the PHQ-9 have been described in the original validation [15]. This 9-item instrument offers four response options, from 0 (never) to 3 (almost every day). The highest sensitivity (78%; 61.5–89.2) and specificity (87%; 83.0–89.9) were determined at a cut-off point ≥ 9 for screening major depressive episodes [16] in this Brazilian population.

Both the Demand–Control–Support Questionnaire (DCSQ), adapted to Brazilian Portuguese [17], and the Brazilian version of the ERI-Questionnaire (ERI-Q) [18] were used to assess work psychosocial domains.

The DCSQ [17] comprised 17 items: psychological demands (5 items) and control and social support (6 items each). Statements were Likert-scaled items scored according to frequency. The ERI-Q, in the Brazilian version [18], included 23 items: effort and over-commitment (6 items each) and reward (11 items) with statements Likert-scale scored according to degree of agreement.

The questionnaire also included information on sociodemographic covariates such as gender, age, self-referred skin colour, marital status, years of schooling, housing and monthly family income scaled by Brazilian minimum wage; work variables, including type of bank (public/private), total years worked, occupation, years worked in the current position, workplace (administrative sector, branch office) and work-related academic training (yes/no); and health-related information including absenteeism, use of health care services in the preceding 30 days and the use of medicines for mental disorder/sleep disorders. The adequacy of the questionnaire and data collection procedures was assessed in pilot testing with 16 subjects who were excluded from the study.

An invitation explaining the research with an access link to the questionnaire was sent to eligible individuals by e-mail. Due to the initial low response rate (24%), a list of non-respondents was prepared and the questionnaires were delivered personally to the relevant financial services workplaces in state capitals and surrounding municipalities by a team in each state. The employees were informed about the research and were asked if they had answered the study by e-mail.

The statistical analysis was performed using the Stata 11.0 software package. Data on date of birth, name of bank, admission date and gender allowed checking for duplication of data; all cases in which this occurred were excluded.

Depressive symptoms were classified following PHQ-9 instructions [15] based on the participants' endorsement of symptoms over the previous 2 weeks. ODS was defined

as two to four of nine depressive symptom criteria (DSC) present on more than half the days of the prior 2 weeks and one of the symptoms as depressed mood or anhedonia. MDS entailed more than or equal to five of nine DSC on more than half the days and also requiring one of the symptoms to be depressed mood or anhedonia. The one exception to the time requirement was endorsement of the suicidal ideation item, which was counted as a positive response regardless of duration.

Demand–control quadrants were constructed by the cross-tabulation of demand and control dimensions, and both scores were dichotomized at the sample's median, as in the original instrument of Karasek *et al.* [7], forming four categories: high strain (high demand/low control), active (high demand/high control), passive (low demand/low control) and low strain (low demand/high control), this latter used as a referent category. Social support dimension scores were dichotomized at the sample's median, creating two categories: high (referent) versus low social support. To standardize the ERI model [19], scores of each dimension (effort, reward and over-commitment) were categorized into terciles and contrasted by dichotomizing the most adverse tercile against the other two. For effort and reward, this created four categories: low effort/high reward (reference), high effort/high reward, low effort/low reward and high effort/low reward (high risk). For the over-commitment dimension, the two lower terciles were the referent category contrasted with the upper or high over-commitment tercile. Effort–reward ratio (ER-ratio) was calculated according to established recommendations [3] and categorized in terciles, with the two lowest terciles (effort–reward balance) contrasted with the upper tercile (ERI).

The initial analyses described the sample's job characteristics demographics, the frequency distribution of depressive symptoms and psychosocial work conditions. Bivariate analysis was conducted to determine the association between the participant characteristics and ODS–MDS using Pearson's Chi-square test (Table 1). Associations between psychosocial work conditions and depressive symptoms were estimated through polynomial logistic regression. Two separate analyses were carried out: one for the DCSQ model (ODS–MDS/DCSQ) another for the ERI-Q components (ODS–MDS/ERI-Q). In the first round, likelihood-ratio test *P* values and their 95% CIs for the simple odds ratios (ORs) were calculated. Subsequently, each model was adjusted for age, gender and job characteristics. Variables with a *P* value ≤ 0.25 from bivariate analysis were included in the multivariate logistic regression model in order to test theoretically important variables (such as work status) that had not been statistically associated with depressive symptoms in the bivariate analysis.

Results

Of 2806 eligible subjects, 670 returned the questionnaires by e-mail and 775 in person, for a total of 1445 respondents (total response rate = 52%). Of these, 392

were partially or incompletely answered and were not included in the analyses. Thus, we obtained 1053 complete responses to the questionnaires. Since only seven people self-reported their race or skin colour as indigenous and accounted for a very small proportion of the sample (<1%), they were removed from the analysis, making the final study population, for analysis purposes, of 1046 people. There was no statistically significant difference between participants and non-participants in age group or gender.

We did not find any statistically significant difference between the two groups of respondents (mail versus personal contact) in sociodemographic, health and work variables (except for marital status and level of education, where there were more e-mail respondents with under 11 years' education compared with those contacted personally) or in reported levels of work stressors (Table S1, available as Supplementary data at *Occupational Medicine Online*). Therefore, the remaining analyses were carried out combining the two groups as a single sample.

Among the participants, 75% (789) were from Pará and 25% from Amapá. Mean age was 36.7 (SD = 9.6, range 19–66). The absenteeism rate across 30 days was 21%. The overall prevalence of depressive symptoms was 32%; prevalence by symptom severity was 18% for MDS (men, 16%; women, 19%) and 14% for ODS (men, 13%; women, 17%), with no statistically significant difference between men and women in both cases.

Table 1 summarizes characteristics of the study population according to category of depressive symptoms. The three health condition variables were all associated with MDS ($P < 0.001$) and the use of medication for mental or sleep disorders was also associated with ODS ($P < 0.05$). Working in a private bank, in a branch office and years worked in current position were associated with ODS ($P < 0.05$), while total years worked in the banking sector was associated with MDS ($P < 0.05$).

Adverse psychosocial work conditions were strongly associated with MDS and ODS (Tables 2 and 3). In the JDSC, with low strain considered as the reference group, high strain conditions were significantly associated with both ODS and MDS. After further adjustment, these associations remained significant for MDS (OR 2.67; 95% CI 1.54–4.63), although not for ODS (OR 1.68; 95% CI 0.90–3.15). Low social support increased the likelihood of both ODS and MDS, and these associations did not change after model adjustment (OR 1.70 and 3.19, respectively). Stronger associations were observed for both categories of depressive symptoms as exposure levels worsened, as evidenced by the JDSC (Table 2).

In the ERI analysis, using low effort/high reward as reference, work requiring high effort/low reward showed a strong association with ODS and MDS, and these associations remained significant in the adjusted model for ODS (OR 5.13; 95% CI 2.01–13.05) but MDS was not significant (OR 2.33; 95% CI 0.98–5.51).

Table 1. General characteristics of the study participants according to depression classification

Variable	<i>n</i>	No depressive symptoms, <i>n</i> (%)	ODS, <i>n</i> (%)	<i>P</i> value ^a	MDS, <i>n</i> (%)	<i>P</i> value ^a
Sociodemographic						
Gender						
Male	579	411 (71)	73 (13)	NS	95 (16)	NS
Female	467	300 (64)	78 (17)		89 (19)	
Age group (years)						
19–30	320	218 (68)	46 (14)	NS	56 (18)	NS
31–40	400	260 (65)	64 (16)		76 (19)	
41–50	201	138 (69)	26 (13)		37 (18)	
51–66	125	95 (76)	15 (12)		15 (12)	
Self-referred skin colour						
White	337	234 (69)	44 (13)	NS	59 (18)	NS
Dark skinned	589	398 (68)	92 (15)		99 (17)	
Black	93	64 (69)	9 (10)		20 (21)	
Yellow	27	15 (56)	6 (22)		6 (22)	
Marital status						
Married	530	372 (70)	72 (14)	NS	86 (16)	NS
Single	371	246 (66)	53 (14)		72 (20)	
Separated/widowed/divorced	145	93 (64)	26 (18)		26 (18)	
Homeowning status						
Homeowner	584	405 (69)	82 (14)	NS	97 (17)	NS
Non-homeowner	462	306 (66)	69 (15)		87 (19)	
Education (years)						
≤11	123	84 (68)	19 (16)	NS	20 (16)	NS
12–16	680	461 (68)	96 (14)		123 (18)	
≥17	243	166 (68)	36 (15)		41 (17)	
Monthly family income (in wages)^b						
≥10	158	115 (73)	18 (11)	NS	25 (16)	NS
>7–9	186	111 (60)	38 (20)		37 (20)	
>5–7	290	198 (68)	43 (15)		49 (17)	
>3–5	264	175 (66)	36 (14)		53 (20)	
≤3	148	112 (76)	16 (11)		20 (13)	
Health						
Absenteeism in the last 30 days						
No	828	587 (71)	119 (14)	NS	122 (15)	***
Yes	218	124 (57)	32 (15)		62 (28)	
Medication for mental/sleep disorders						
No	948	677 (71)	130 (14)	*	141 (15)	***
Yes	98	34 (35)	21 (21)		43 (44)	
Use of health services in the last 30 days						
No	684	499 (73)	96 (14)	NS	89 (13)	***
Yes	362	212 (59)	55 (15)		95 (26)	
Work						
Bank						
Public bank	775	546 (71)	96 (12)	**	133 (17)	NS
Private bank	271	165 (61)	55 (20)		51 (19)	
Total years worked						
1–2	256	192 (76)	32 (12)	NS	32 (12)	*
3–6	304	209 (69)	45 (15)		50 (16)	
7–≥16	486	310 (64)	74 (15)		102 (21)	
Work status						
Manager	212	139 (66)	30 (14)	NS	43 (20)	NS
Teller	230	157 (68)	40 (18)		33 (14)	
Others	312	209 (67)	48 (15)		55 (18)	
Bank clerk	292	206 (71)	33 (11)		53 (18)	
Years worked in the current position						
≤1 year	287	214 (75)	24 (8)	**	49 (17)	NS
2–4	407	274 (67)	60 (15)		73 (18)	
5–≥10	352	223 (63)	67 (19)		62 (18)	
Workplace						
Administrative sector	164	128 (78)	15 (9)	*	21 (13)	NS
Branch office	882	583 (66)	136 (15)		163 (19)	
Work-related academic training						
Yes	382	267 (70)	57 (15)	NS	58 (15)	NS
No	664	444 (67)	94 (14)		126 (19)	

NS, non-significant.

^aChi-square test.^bMinimum salary in real = R\$678.00.**P* < 0.05, ***P* < 0.01, ****P* < 0.001.

The ER-ratio imbalance was associated with MDS in the adjusted model (OR 1.75; 95% CI 1.12–1.76). However, for ODS, the ER-ratio imbalance unexpectedly showed a protective effect against ODS in the adjusted model (OR 0.58; 95% CI 0.35–0.94). Also in the adjusted model, over-commitment showed an independent effect on both ODS (OR 3.07) and MDS (OR 6.24) (Table 3).

Discussion

This study found that 32% of bank employees, irrespective of gender, had depressive symptoms and could therefore potentially be considered clinically depressed. Having a job characterized as high strain, low social support, high effort/low reward and high over-commitment was strongly associated with both major and other depressive symptoms. These

associations were independent of age, gender and other job characteristics.

We found a high prevalence of depressive symptoms (32%), similar to the prevalence found in a Chinese study among employees engaged in a variety of jobs, including managers, technicians, workers and auxiliary workers from factories or companies (32%) [10], and lower than in a study in Japan (39%) among workers of a small production plant involved with the production of electric equipment for automobiles [9]. Differing instruments and algorithms used for the diagnosis of depression may in part explain this variability [5]. In Brazil, studies estimating prevalence of depression in the general population have also shown a high variability, with prevalence rates ranging from 8% found using 1 month records [20] to 10 and 18% using 1 year and lifelong records, respectively [21]. Our findings are similar to those of a recent study carried out in 143

Table 2. Unadjusted and adjusted ORs for depression levels by categories of the demand–control model and social support

Exposure	n	No depressive disorder, n (%)	ODS			MDS			ODS		MDS	
			n (%)	OR ^a	95% CI ^a	n (%)	OR ^a	95% CI ^a	OR ^b	95% CI ^b	OR ^b	95% CI ^b
Demand–control model												
Low strain	463	342 (74)	66 (14)	1		55 (12)	1		1		1	
Passive work	310	221 (71)	31 (10)	0.72	0.45–1.15	58 (19)	1.63	1.08–2.44	0.59	0.36–0.97	1.22	0.79–1.88
Active work	162	95 (59)	34 (21)	1.85	1.15–2.97	33 (20)	2.16	1.32–3.51	1.67	1.02–2.73	1.67	1.00–2.78
High strain	111	53 (48)	20 (18)	1.95	1.09–3.48	38 (34)	4.45	2.69–7.38	1.68	0.90–3.15	2.67	1.54–4.63
Social support												
High	651	498 (77)	85 (13)	1		68 (10)	1		1		1	
Low	395	213 (54)	66 (17)	1.81	1.26–2.60	116 (29)	3.98	2.83–5.60	1.7	1.15–2.52	3.19	2.21–4.60

^aOR unadjusted and 95% CI obtained from bivariate multinomial logistic regression.

^bOR and 95% CI obtained from multivariate multinomial logistic regression models adjusted for gender, age and work variables.

Table 3. Unadjusted and adjusted ORs for depression levels by categories of the ERI model and over-commitment

Exposure	n	No depressive disorder, n (%)	ODS			MDS			ODS		MDS	
			n (%)	OR ^a	95% CI ^a	n (%)	OR ^a	95% CI ^a	OR ^b	95% CI ^b	OR ^b	95% CI ^b
ERI model												
Low efforts/high rewards	454	346 (76)	53 (12)	1		55 (12)	1		1		1	
Low efforts/low rewards	308	205 (66)	39 (13)	1.24	0.79–1.94	64 (21)	1.96	1.31–2.92	1.47	0.89–2.43	1.54	0.93–2.53
High efforts/high rewards	232	136 (58)	48 (21)	2.30	1.48–3.57	48 (21)	2.22	1.43–3.43	1.56	0.92–2.64	0.85	0.48–1.48
High efforts/low rewards	52	24 (46)	11 (21)	2.99	1.38–6.46	17 (33)	4.45	2.24–8.82	5.13	2.01–13.05	2.33	0.98–5.51
ER-ratio												
Balance	700	507 (72)	105 (15)	1		88 (13)	1		1		1	
Imbalance	346	204 (59)	46 (13)	1.08	0.74–1.59	96 (28)	2.71	1.94–3.77	0.58	0.35–0.94	1.75	1.12–1.76
Over-commitment												
Low	743	584 (79)	82 (11)	1		77 (10)	1		1		1	
High	303	127 (42)	69 (23)	3.86	2.66–5.62	107 (35)	6.39	4.50–9.06	3.07	2.02–4.66	6.24	4.23–9.21

^aOR unadjusted and 95% CI obtained from bivariate multinomial logistic regression.

^bOR and 95% CI obtained from multivariate multinomial logistic regression models adjusted for gender, age and work variables.

Brazilian cities, where prevalence of depressive symptoms was 28% (13% mild/moderate and 15% major/severe), with higher prevalence rates in the northern region of Brazil compared with the southern regions [22]. In the working population, data are scarce. A study of truck drivers in North-eastern Brazil found 14% prevalence of depression [23]. In our results, no gender differences were found for prevalence of depressive symptoms, which is consistent with one other study [8], although gender differences were found in other studies [4,11].

High strain at work was associated with both MDS and ODS in this research, although the association became non-significant for ODS after further adjustment. Several cross-sectional studies have also found elevated ORs for major depression [11] and depressive symptoms [10] among people experiencing high work-related stress. We observed a strong association between low social support and MDS and ODS, confirming previous findings [10,24]. Indeed, employees exposed to high strain and low social support showed a higher prevalence of health problems compared with those with high social support [25]. Recent reviews of cross-sectional [5] and prospective studies [26] have confirmed these results.

Our data showed that high effort/low reward was associated with ODS, with marginal significance for MDS. In the adjusted model, the ER-ratio imbalance was associated with MDS and, surprisingly, showed a protective effect for ODS. This result suggests that perhaps interactions between psychosocial factors and other work-related variables may reduce the effect of ER-ratio imbalance on ODS. However, further studies are needed to evaluate the consistency of this finding. Another study has also identified a strong association between ERI and severity of depression [11]. Overcommitment was associated to a significant extent with both ODS and MDS, in line with previous research for major depressive disorder [4] and depressive symptoms [27].

In this study, working in a private bank, in a branch office and years worked in current position were associated with ODS, while total years worked was associated with MDS. Work in the banking sector requires continuous updating of skills to keep up with new forms of organization of work. This might add additional stress for employees, especially for older workers, who may feel threatened by such pressures as they lack these skills [2]. Working in the private bank sector may also represent a higher risk of employment instability. Bank downsizing is one of the main concerns for workers, and it results, for those who stay, in greater pressure at work, stress and overload among employees [2].

This study has some limitations. The direction of the association between depressive symptoms and psychosocial work conditions cannot be determined

due to the cross-sectional design and may be a result of reverse causality. While psychosocial stressors may increase the risk of depression, depression may also cause more psychosocial stressors. Recent studies demonstrate a reciprocal interplay between psychosocial job stressors and worker well-being [28], and with workplace violence [29]. Second, the response rate was low, 52%, although there was no statistically significant difference in gender and age group between participants and non-participants. Two reasons could explain this low response. Not all subjects who received the invitation by e-mail could access the internet research link due to some banks' security systems. Alternatively, some who received questionnaires personally, after initially agreeing to participate, subsequently claimed not have time to complete it. Third, it is possible that there was a participation bias in the study, and that those workers with a greater perception of illness were the ones responding to the research, which may have contributed to an overestimation in the prevalence of depression. Fourth, psychosocial work conditions and mental health were measured simultaneously by self-reporting, which can be influenced by some aspects of personality. Although it has been suggested that aspects of personality do not explain totally the associations observed in mental health [30], common-instrument bias cannot be fully excluded. Finally, the PHQ-9 is an instrument for the screening of depressive symptoms in population studies, but clinical diagnosis of depression needs confirmation by a psychiatrist. Despite these limitations, it is likely that the observed link between psychosocial work conditions and depressive symptoms in this study reflect their association in the source of this sample.

In conclusion, we found significant association of adverse psychosocial work conditions produced by job strain and ERI with MDS and ODS among bank employees. In addition to contributing to the research indicating complementarity in the use of the two stress models in association with depressive symptoms, these findings highlight the need to intensify preventive efforts that might modify this threat among these workers.

Key points

- This study found two work-related stress models to be associated with major depressive symptoms and other forms of depressive symptoms, in bank employees in Northern Brazil.
- The impact of work stressors on depressive symptoms found in this study was independent of age, gender and other job characteristics.
- These findings call attention to the need to intensify preventive efforts that might modify this threat among these workers.

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Conflicts of interest

None declared.

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