Association between workplace bullying and common mental disorders in civil servants from a middle-income country

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Abstract: Workplace bullying (WB) is associated with Common mental disorders (CMD) in high-income countries, but there is a lack of evidence relating to this subject in low- and middle-income countries. Therefore, this study aimed to investigate the association between bullying and CMD in Brazil. A cross-sectional study with 907 judicial civil servants from Porto Alegre, southern Brazil, was carried out. WB was measured by the Negative Acts Questionnaire (NAQ-r) and CMD by the Self-Reporting Questionnaire (SRQ-20). Logistic regression was used to analyse data and test hypotheses. The overall prevalence of CMD was 32.8%, while the overall prevalence of bullying was 18.3%. WB was strongly associated with CMD, even after controlling for confounders. After adjustment for sociodemographic, personality and occupational confounders, weekly and daily exposures to negative acts increased 4.32 (95% CI: 2.00–9.33) and 6.80 (95% CI: 3.42–13.51) times the risk of CMD, respectively. Considering the operational definition, bullied workers had a 3.45 (95% CI: 2.26–5.25) higher risk of CMD. The results are consistent with studies from high-income countries. Different ways of categorising exposure to WB and testing association with CMD are suggested. Interventions to prevent bullying, focusing on work processes and psychosocial factors at work, could reduce the risk of mental health problems.

Key words: Workplace bullying, Common mental disorders, Occupational health, Epidemiology, Psychosocial factors at work

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Introduction

Common mental disorders (CMD) — which include depression, anxiety and other stress-related disorders — have a high prevalence worldwide, affecting approximately 30.0% of the world population during lifetime and 18.0% during the last year. In Brazil, the estimated prevalence of CMD varies according to city, from 14.9% in Florianópolis to 29.6% in São Paulo. The prevalence also varies according to different occupational groups, from 16.0% among primary health care professionals, up to 42.0% in other health professionals, and 55.0% among public teachers. Also, in the ELSA-Brazil, a current cohort study following more than 15,000 civil servants, the baseline prevalence of CMD was 26.8%, which was similar to the prevalence in UK civil servants from the Whitehall II study (from 20.6% in men, to 33.8% in women).

CMD increase absenteeism, disability, morbidity and demands for health care, with high social and economic impact, being the leading cause of years living with disability (YLD) and accounting for more than one-sixth of the global burden of disease. In high-income countries, mental disorders overlapped musculoskeletal disorders as the main cause of sick leave and disability, which also occurs with some groups of Brazilian civil servants. For these reasons, CMD have been identified as a major problem for public health and occupational health.

Some psychosocial and organisational factors at work, such as organisational change, job insecurity, temporary employment status, lack of procedural justice, problems in work design, atypical working hours, occupational stress, lack of social support and workplace conflicts are associated with CMD. Workplace bullying is also one of these risks, with several consequences in workers’ health. Workplace bullying (also called “mobbing”) means harassing, offending, socially excluding someone or negatively affecting someone’s work. In order for the label bullying to be applied to a particular process, interaction or activity, it needs to occur repeatedly and regularly (e.g., weekly) and over a period of time (e.g., around six months). During its occurrence, the person may end up in an inferior position, becoming a target of negative behaviours, in an escalating process characterized by systematic negative social actions. An interpersonal conflict cannot be classified as bullying if the incident is a unique event or if two individuals have similar “strength” in the situation.

According to recent systematic reviews, bullying at work can increase 1.68 (95%, CI 1.35–2.09) times the risk of mental health problems, 2.8 (95%, CI 2.21–3.59) times the risk of depression, and can explain more than one-quarter of the CMD variability. Longitudinal findings from high-income countries — such as Denmark, Norway and Finland — also indicate an important causal relationship between bullying and CMD. Nevertheless, most of the data about workplace bullying and its association with mental health problems are from high-income countries. Studies concerning this subject are scarce in low- and middle-income countries such as Latin American countries and were found only in the grey literature. Considering the inequalities between low- and middle-income countries and high-income nations in relation to socioeconomic context and adverse working conditions, as well as the existence of substantial cultural differences between Latin American and North American/European countries, we hypothesized that the magnitude of effect of the association between bullying and CMD is higher in Latin and South America, particularly in Brazil.

Also, most of the studies that investigated the association between bullying and CMD did not measure possible confounders, such as other occupational characteristics and psychosocial factors at work which can be antecedents of this particular type of violence. Therefore, this study aimed to investigate the association between workplace bullying and CMD in a group of civil servants from the Federal Judiciary of Porto Alegre, southern Brazil, analysing sociodemographic and occupational factors involved in this relationship.

Methods

Study design and participants

This is a cross-sectional study. Data were collected between July and October 2018. The target population was judicial federal civil servants from Porto Alegre, the capital of Rio Grande do Sul, a state in southern Brazil. Inclusion criteria were being a civil servant in the Federal Judiciary for at least six months and working during the period of data collection. Exclusion criteria were being either a trainee, temporary or outsourced worker. All workers who met the inclusion criteria were contacted by e-mail and were invited to answer the self-reported questionnaire, which could be accessed online through a link available in the personal institutional e-mail.

Measurement of main outcome and main exposure

The Self-Reporting Questionnaire (SRQ-20) was used to evaluate Common Mental Disorders. This inventory is compounded by 20 binary (yes/no) questions related to
mental health, and the cut-off points suggested by the Brazilian validation study were 6 or more positive answers for men and 8 or more positive answers for women. The Negative Acts Questionnaire - Revised (NAQ-r) was used to measure workplace bullying. The NAQ-r is compounded by 22 questions (with answers on a Likert scale), asking about the frequency (never, now and then, monthly, weekly, and daily) of the individual’s exposure to negative acts, perpetrated by others in the workplace, in the last six months. Subjects who reported at least one negative act on a weekly basis were classified as ‘bullied’. This operational definition of bullying was the most commonly described in the literature. To test the association between bullying and CMD, we also analysed the exposure to bullying in two additional ways: as a polytomous variable, considering the five frequencies of the Likert scale in the NAQ-r (at least one negative act in the last six months in any of the following frequencies: never, now and then, monthly, weekly, and daily); and as a score, using the cut-off points (<33, not bullied; 33–45, occasionally bullied; >45, victims of severe workplace bullying) proposed by Notalaers and Einarsen (2012).

Measurement of covariates

The general questionnaire also included information on sociodemographic and other occupational characteristics. The validated Brazilian versions of the Job Stress Scale (JSS) and the Effort-Reward Imbalance (ERI) Scale were used to evaluate occupational stress, using the job strain and effort-reward imbalance models, respectively. The JSS included five questions to evaluate psychological demands and six questions to evaluate control, with answers on a four-point Likert scale (“frequently”, “sometimes”, “rarely”, and “never or almost never”). Scores ranged from 5 to 20 (demands) and 6 to 24 (control), and were dichotomised in two categories (low and high), with the median as a cut-off point. Based on this, the exposure to job strain was divided in four categories: low strain (high control and low demand); active job (high control and high demand); passive job (low control and low demand); and high strain (low control and high demand). The ERI Scale comprised six items to evaluate effort and 11 items to evaluate reward, also with answers on a Likert scale and scored from 1 to 4 (“strongly disagree”, “disagree”, “agree”, “strongly agree”). Total scores ranged from 6 to 24 points (effort) and 11 to 44 points (reward). Higher scores indicated higher effort and higher reward. ERI was calculated by the effort-reward ratio, according to the formula e/(r × c), which is defined by the sum of the effort score (“e”), divided by the sum of the reward score (“r”), and multiplied by the correction factor (“c”) that accounts for the unequal number of items. Ratio values were categorised in tertiles, defining three categories of exposure (low, moderate and high ERI).

A translated version of the PSC–12 Scale was used to evaluate psychosocial safety climate. The PSC-12 is a 12-item questionnaire encompassing four sub-scales, evaluating management commitment, management priority, organisational communication, and organisational participation. Each sub-scale consists of three questions with responses scored on a five-point Likert scale, ranging from 1 (“strongly disagree”) to 5 (“strongly agree”). Total scores for the scale can range from 12 to 60. Cut-off scores were classified as low risk (≥41), moderate risk (>37 and <41), and high risk (<37).

Furthermore, a Brazilian adapted version of the Big Five Inventory-10 (BFI-10) was used to evaluate personality traits, including extroversion, agreeableness, conscientiousness, neuroticism and openness to experience. Each trait was evaluated by two different questions, with answers on a Likert scale. Answers scored from 1 to 5, and, for each trait, one of the questions was on a reverse scale. All scales and measurements are described in more details in previous publications.

Statistical Analyses

The studied population was described in absolute and relative frequencies. Logistic regression was used to evaluate associations of all independent variables with the main exposure (bullying) and outcome (CMD). Logistic regression was also used to test the association between bullying and common mental disorders. Fourteen covariates were considered possible confounders (sex and age in the first model; skin colour, educational level, years of work, and personality traits (5 variables) in the second model; and job strain, effort-reward imbalance and psychosocial safety climate in the third model). Previous knowledge supported our theoretical model, which guided modelling strategies. In model 1, only the “forced” variables were included; in model 2, all potential confounders (variables clearly not on the causal pathway) were included; and in model 3, a full model, adding other psychosocial factors at work (possible mediators of the association between bullying and CMD), were tested. Collinearity between variables was tested by the verification of variance inflation factors (VIF) and changes in regression coefficients. The criterion to keep variables in the model was VIF <3. Pearson correlation test was used to examine correlation between variables.
Ethical procedures

The study was approved by the Research Ethics Committee from the Federal University of Pelotas and is registered in the Brazilian National Platform for Research (Plataforma Brasil) (registration number 86800218.9.0000.5317). The principles from the Declaration of Helsinki were followed. The administration of the Federal Judiciary of Porto Alegre and the trade union (legal representative of the civil servants) signed a formal agreement with the study. The institution and the union supported the research and the data collection, providing the list of e-mails and sending the online questionnaires to all eligible subjects. All respondents included in the study agreed to participate and signed the online informed consent form. Those who did not return the questionnaire providing complete information were considered losses. The deadline to receive the questionnaires was defined by the researchers for logistic reasons.

Results

2,403 workers who met the inclusion criteria were contacted by e-mail and 907 of those (37.7% response rate) returned the questionnaire providing complete information. The participation of female workers was slightly higher (51.7%) and almost half of the participants were aged between 35 and 44 years-old. More than 90.0% of participants were white with a high educational level. Regarding occupational characteristics, approximately 45.0% worked in the Labour Court of Porto Alegre and the same percentage performed administrative activities. The majority were technicians, worked with virtual processes and had a schedule of up to 7 hours a day. More than one-third have worked in the Federal Judiciary of Porto Alegre for more than 20 years (Table 1). The differences between respondents and non-respondents are described in the Appendix Table 2, showing some differences concerning sex, age, educational level and field of expertise.

The prevalence of workplace bullying (based on the ‘operational definition’) was 18.3% (19.2% among men and 17.5% among women). Initially, risk factors for workplace bullying adjusted for sex and age were analysed. Sex, field of expertise, job position, tenure and work hours were not associated with bullying. However, older age, white skin colour and lower educational level were associated with a lower risk of being bullied. In relation to personality traits, neuroticism was associated with bullying. Furthermore, occupational factors such as telephone and help desk activities, having worked more than 20 years in the institution, extra hours, lack of breaks, absence of bonus income, high pressure for goals, high job strain, high effort-reward imbalance, and high-risk psychosocial safety climate were associated with a higher risk of bullying.

The overall prevalence of common mental disorders was 32.8%, and sex and age group were not associated with CMD. The risk of CMD was 66% higher among black, Asian and Indigenous people (p<0.001), compared to white workers. Workers with lower educational levels also had a higher risk of CMD. With regard to occupational characteristics, having more than 15 years of work, absence of breaks during the shift, pressure for goals, high job strain, high effort-reward imbalance and high-risk psychosocial safety climate were associated with higher risk of CMD (Table 1). All personality traits were associated with CMD. Higher extroversion, agreeableness, conscientiousness and openness to experiences reduced the risk of CMD, whilst higher neuroticism increased the risk (Table 2).

All regression models showed a positive association between workplace bullying, considering the three categorisations, and common mental disorders. Those exposed to workplace bullying (operational definition) had a 3.32 (95% CI: 2.34–4.72) times higher risk of CMD, compared to those unexposed, after adjustment for sex and age group. In the second model, after controlling for sex, age group, skin colour, educational level, years of work, main role, and personality traits, those exposed to workplace bullying weekly or daily had almost 3 times the risk of CMD, compared to those unexposed (adjusted OR 3.45, 95% CI: 2.26–5,25). In the full model, after adjusting for all covariates from the second model plus occupational stress (job strain and effort-reward imbalance), the association remained strong (adjusted OR 2.31, 95% CI: 1.48-3.61; p<0.001) (Table 3).

Considering the exposure to workplace bullying as a polytomous variable (five categories of negative acts, based on frequency), the first model showed that those exposed to daily, weekly, monthly and ‘now and then’ negative acts had a 7.8, 5.1, 4.7, and 2.1 times higher risk of CMD, respectively, compared to those not bullied (p<0.01). In the second model, the risk of CMD among bullied workers on a daily or weekly basis was 6.80 (95% CI 2.00–9.33) and 4.32 (95% CI 3.42–13.51) times higher, compared with non-bullied workers, respectively (Table 3).

Also, when considering the score levels of the NAQ-r, all associations remained strong and positive. In the first model, scores 33–45 and >45 were associated with 3.57 (95% CI 2.47–5.15) and 4.86 (95% CI 2.28–10.36) times higher risk of CMD, respectively, compared to scores lower than
Table 1. Sociodemographic and occupational characteristics of judicial civil servants from Porto Alegre, Rio Grande do Sul, Brazil, and risk factors for common mental disorders (adjusted for sex and age), 2018 (n=907)

| Variables                      | Respondents | CMD | POR | 95% CI         | p-value |
|--------------------------------|-------------|-----|-----|----------------|---------|
|                                | n (%)       | n (%) |     |                |         |
|                                |POR          | CI   |     |                |         |
| Sex                            |             |      |     |                |         |
| Male                           | 438 (48.3)  | 151 (34.5) | 1.00 |                |         |
| Female                         | 469 (51.7)  | 146 (31.1) | 0.85 | 0.64–1.13      | 0.267   |
| Age (categories)               |             |      |     |                |         |
| <35                            | 136 (15.0)  | 47 (34.6) | 1.00 |                |         |
| 35–44                          | 296 (47.6)  | 105 (35.5) | 1.05 | 0.69–1.62      |         |
| 45–54                          | 329 (36.3)  | 109 (33.1) | 0.96 | 0.63–1.46      |         |
| >=55                           | 146 (16.1)  | 36 (24.7) | 0.62 | 0.37–1.05      |         |
| Skin Colour                    |             |      |     |                |         |
| White                          | 834 (92.0)  | 265 (31.8) | 1.00 |                |         |
| Black, Brown, Asian, Indigenous| 73 (8.0)    | 32 (43.8) | 1.46 | 0.88–2.46      | 0.043   |
| Educational level              |             |      |     |                |         |
| Postgraduate, MSc, PhD         | 532 (58.6)  | 159 (29.9) | 1.00 |                |         |
| Graduate                       | 301 (33.2)  | 110 (36.5) | 1.40 | 1.03–1.90      |         |
| High School                    | 74 (8.2)    | 28 (37.8) | 1.47 | 0.88–2.46      | 0.027*  |
| Court                          |             |      |     |                |         |
| Regional Federal Court         | 176 (19.4)  | 58 (32.9) | 1.00 |                |         |
| (2nd Court)                    |             |      |     |                |         |
| Federal Court (1st Court)      | 125 (13.8)  | 40 (32.0) | 0.90 | 0.55–1.49      |         |
| Electoral Court                | 201 (22.2)  | 62 (30.9) | 0.90 | 0.58–1.39      |         |
| Labour Court                   | 405 (44.6)  | 137 (33.8) | 1.01 | 0.69–1.48      |         |
| Field of expertise             |             |      |     |                |         |
| Administrative (1st court)     | 126 (13.9)  | 34 (27.0) | 1.00 |                |         |
| Administrative (2nd court)     | 278 (30.6)  | 88 (31.7) | 1.25 | 0.78–2.00      |         |
| Judicial (1st court)           | 233 (25.7)  | 78 (33.5) | 1.35 | 0.83–2.18      |         |
| Judicial (2nd court)           | 270 (29.8)  | 97 (35.9) | 1.52 | 0.95–2.43      |         |
| Job position                   |             |      |     |                |         |
| Analyst                        | 306 (33.7)  | 98 (32.0) | 1.00 |                |         |
| Technician                     | 601 (66.3)  | 199 (33.1) | 1.05 | 0.78–1.42      | 0.731   |
| Tenure                         |             |      |     |                |         |
| Administrative (office work)   | 481 (53.0)  | 155 (32.2) | 1.00 |                |         |
| Judicial (office work)         | 330 (36.4)  | 110 (33.3) | 1.06 | 0.79–1.44      |         |
| IT (office work)               | 67 (7.4)    | 23 (34.3) | 0.99 | 0.56–1.72      |         |
| Security and Judicial Officer  | 29 (3.2)    | 9 (31.0)  | 0.94 | 0.41–2.15      |         |
| Main role/activity             |             |      |     |                |         |
| Virtual Process                | 479 (52.1)  | 155 (32.4) | 1.00 |                |         |
| Paper Process                  | 48 (5.3)    | 16 (33.3) | 1.13 | 0.60–2.13      |         |
| Non judiciary activity         | 237 (26.1)  | 82 (34.6) | 1.09 | 0.78–1.52      |         |
| Telephone/help desk            | 33 (3.6)    | 14 (42.4) | 1.63 | 0.79–3.37      |         |
| Other                          | 110 (12.1)  | 30 (27.3) | 0.80 | 0.50–1.28      |         |
Table 1. Continued

| Variables                      | Respondents | CMD | POR | CI 95% | p-value |
|-------------------------------|-------------|-----|-----|--------|---------|
|                               | n (%)       | n (%) | POR | CI 95% |         |
| **Years of work**             |             |      |     |        |         |
| <10                           | 250 (27.6)  | 74 (29.6) | 1.00 | -      |         |
| 10–14                         | 231 (25.5)  | 75 (32.5) | 1.40 | 0.91–2.15 |         |
| 15–19                         | 111 (12.2)  | 48 (43.2) | 2.30 | 1.36–3.89 |         |
| >=20                          | 315 (34.7)  | 100 (31.8) | 1.74 | 1.04–2.92 | 0.019*  |
| **Work hours (per day)**      | n=904       |      |     |        | 0.713* |
| Up to 6                       | 375 (41.5)  | 127 (33.9) | 1.00 | -      |         |
| 7                             | 363 (40.1)  | 114 (31.4) | 0.89 | 0.65–1.21 |         |
| 8 or more                     | 166 (18.4)  | 56 (33.7) | 1.02 | 0.69–1.50 |         |
| **Work hours (continuous)**   |             |      |     |        |         |
|                               |             |      | 0.99 | 0.87–1.14 | 0.942 |
| **Extra hours**               | n=904       |      |     |        |         |
| No                            | 560 (61.9)  | 177 (31.6) | 1.00 | -      |         |
| Yes                           | 344 (38.1)  | 120 (34.9) | 1.17 | 0.88–1.56 | 0.282 |
| **Extra hours (days per month)** | n=904   |      |     |        | 0.338* |
| None                          | 559 (61.8)  | 176 (31.5) | 1.00 |         |         |
| 1 to 4                        | 97 (10.7)   | 39 (40.2) | 1.48 | 0.94–2.32 |         |
| 5 to 9                        | 101 (11.2)  | 37 (36.6) | 1.25 | 0.80–1.95 |         |
| 10 to 14                      | 46 (5.1)    | 16 (34.8) | 1.21 | 0.64–2.29 |         |
| 15 or more                    | 101 (11.2)  | 29 (28.7) | 0.88 | 0.55–1.41 |         |
| **Breaks (not including lunch)** | n=904 |      |     |        |         |
| None                          | 202 (22.3)  | 84 (41.6) | 1.00 | -      |         |
| 1 to 2                        | 485 (53.7)  | 161 (33.2) | 0.71 | 0.50–0.99 |         |
| 3 or more                     | 217 (24.0)  | 52 (24.0) | 0.43 | 0.28–0.66 | <0.001* |
| **Bonus income**              | n=904       |      |     |        |         |
| No                            | 289 (31.9)  | 101 (35.0) | 1.00 | -      |         |
| Yes                           | 618 (68.1)  | 196 (31.7) | 0.84 | 0.62–1.14 | 0.257 |
| **Pressure for goals**        | n=904       |      |     |        |         |
| No                            | 459 (50.8)  | 123 (26.8) | 1.00 | -      |         |
| Low or adequate               | 255 (28.2)  | 87 (34.1) | 1.47 | 1.05–2.05 |         |
| High or very high             | 190 (21.0)  | 87 (45.8) | 2.30 | 1.61–3.28 | <0.001* |
| **Demand-Control Model**      | n=906       |      |     |        |         |
| Low Strain                    | 262 (28.9)  | 48 (18.3) | 1.00 | -      |         |
| Passive Job                   | 248 (27.4)  | 78 (31.5) | 2.05 | 1.36–3.10 |         |
| Active Job                    | 211 (23.3)  | 81 (38.9) | 2.81 | 1.84–4.28 |         |
| Job Strain (High Strain)      | 185 (20.4)  | 90 (48.7) | 4.36 | 2.84–6.70 | <0.001* |
| **Effort-Reward Imbalance**   | n=906       |      |     |        |         |
| Low                           | 325 (35.9)  | 71 (21.9) | 1.00 | -      |         |
| Moderate                      | 300 (33.1)  | 82 (27.3) | 1.33 | 0.92–1.92 |         |
| High                          | 281 (31.0)  | 144 (51.3) | 3.90 | 2.73–5.57 | <0.001* |
Table 1. Mean scores of BFI Scale among judicial civil servants from Porto Alegre, Rio Grande do Sul, Brazil, and the association between common mental disorders and personality traits (adjusted for sex and age), 2018 (n=907)

| Personality Traits | Mean Score | Standard Deviation | POR | CI 95% | p-value |
|--------------------|------------|--------------------|-----|--------|---------|
| Extroversion       | 5.84       | 2.19               | 0.85| 0.80–0.91 | <0.001  |
| Agreeableness      | 6.82       | 1.73               | 0.62| 0.56–0.68 | <0.001  |
| Conscientiousness  | 7.93       | 1.65               | 0.74| 0.67–0.81 | <0.001  |
| Neuroticism        | 5.45       | 2.18               | 1.52| 1.41–1.64 | <0.001  |
| Openness to experience | 7.29       | 2.02               | 0.90| 0.84–0.96 | 0.002   |

Table 2. Association between Workplace Bullying and Common Mental Disorders among civil servants from the Federal Judiciary of Porto Alegre, southern Brazil, 2018 (n=907)

| Workplace Bullying (Operational definition) | Prevalence of CMD | OR (Model 1) | p-value | OR (Model 2) | p-value | OR (Model 3) | p-value |
|--------------------------------------------|------------------|--------------|---------|--------------|---------|--------------|---------|
| No                                         | 204 (27.5%)      | 1            | 1       | 1            |         |              |         |
| Weekly                                     | 93 (56.0%)       | 3.32 (2.34–4.72) | 3.45 (2.26–5.25) | 2.31 (1.48–3.61) | <0.001* | <0.001* | <0.001* |

| Workplace Bullying (Frequency of Negative Acts) | Prevalence of CMD | OR (Model 1) | p-value | OR (Model 2) | p-value | OR (Model 3) | p-value |
|------------------------------------------------|------------------|--------------|---------|--------------|---------|--------------|---------|
| No                                             | 23 (15.7%)       | 1            | 1       | 1            |         |              |         |
| Now and then                                   | 148 (28.2%)      | 2.10 (1.29–3.41) | 1.63 (0.95–2.80) | 1.13 (0.63–2.02) | <0.001* | <0.001* | <0.001* |
| Monthly                                        | 33 (47.1%)       | 4.72 (2.47–9.04) | 3.82 (1.84–7.94) | 1.87 (0.84–4.17) |         |         |         |
| Weekly                                         | 29 (50.0%)       | 5.13 (2.59–10.15) | 4.32 (2.00–9.33) | 2.47 (1.08–5.65) |         |         |         |
| Daily                                          | 64 (59.3%)       | 7.83 (4.34–14.12) | 6.80 (3.42–13.51) | 3.03 (1.41–6.49) |         |         |         |

| Workplace Bullying (Scores)                     | Prevalence of CMD | OR (Model 1) | p-value | OR (Model 2) | p-value | OR (Model 3) | p-value |
|------------------------------------------------|------------------|--------------|---------|--------------|---------|--------------|---------|
| Not bullied                                    | 194 (26.7%)      | 1            | 1       | 1            |         |              |         |
| Occasionally bullied                           | 83 (55.7%)       | 3.57 (2.47–5.15) | 3.07 (1.99–4.73) | 2.09 (1.32–3.30) | <0.001* | <0.001* | <0.001* |
| Severely bullied                               | 20 (64.5%)       | 4.86 (2.28–10.36) | 6.91 (2.73–17.53) | 4.04 (1.53–10.63) |         |         |         |
| Total                                          | 297 (32.8%)      |              |         |              |         |              |         |

POR=Prevalence Odds Ratio; *p-value for trend; #p-value for heterogeneity; 

£ Model 1: adjusted for sex and age; #Model 2: adjusted for sex, age, skin colour, educational level, years of work, main role, and personality traits (extroversion, agreeableness, conscientiousness, neuroticism, and openness); §§Model 3: adjusted for all variables in model 2 + job strain, effort-reward imbalance, and psychosocial safety climate; *p-value for linear trend.
33. After adjustment for covariates in the second model, ORs were 3.07 (95% CI 1.99–4.73) and 6.91 (95% CI 2.73–17.53) (p<0.001), respectively; in the full model (model 3), the risk was 2.09 (95% CI 1.32–3.30) and 4.04 (95% CI 1.53–10.63) times higher among workers who scored 33–45 and >45, compared to those who scored less than 33 (Table 3).

Variables included in the models were weakly correlated. Most correlation coefficients were lower than 0.10 and few reached 0.30 (Appendix Table 1). VIF of all the variables included in the full models were lower than 2.00.

**Discussion**

The prevalence of common mental disorders found in this group of civil servants (32.8%) was similar to other groups of workers8, 9, 30. However, considering the high educational level of these judicial civil servants, the prevalence is higher than the expected for a similar educational and socioeconomic level (10.5% to 19.7%), according to previous population studies in two Brazilian capital cities3, 37. Also the prevalence of workplace bullying (18.3%) was high, although similar to the overall prevalence of bullying estimated by a meta-analysis (14.8%), considering a comparable measure of bullying (the “operational definition”)38. 

The magnitude of the effect of the association between workplace bullying and common mental disorders was remarkable, higher than in previous studies from high-income countries15, 16, 19, 21, even after adjustment for other psychosocial factors. A previous meta-analysis17 found a 68% higher risk of mental health problems in bullied workers, compared to those not bullied. Another recent systematic review of longitudinal studies about bullying, its consequences and mechanisms also indicated that workplace bullying may increase mental health problems39. However, both reviews did not include studies from low- and middle-income countries. Besides, the most recent review identified that very few papers measured effect sizes of this relationship39. Our study measured and identified a much higher effect magnitude compared to the metaanalysis, reaching more than 200% higher risk of CMD among bullied workers, and suggesting that the social context in a middle-income country may worsen the effect of bullying on mental health. The dose-response effect of bullying on CMD, when we tested the negative acts as a polychotomous variable, reinforces the validity of the association.

Several studies about workplace bullying did not control their analyses for important confounders37. Our study tested the association between bullying and CMD in three logistic regression models, including personality traits and several psychosocial factors in the analyses. Our models were in line with the theoretical framework of bullying and its consequences proposed by Einarsen et al. in their recent textbook on the theme38. Occupational stress – which was analysed through job strain and effort-reward imbalance models – and psychosocial safety climate might be on the causal path between bullying and CMD. However, a bidirectional relationship between stress and bullying is also plausible, as workplace bullying may also degrade the work environment30, 41. Workplace bullying was strongly associated with CMD in all models, and, despite the reduction of the magnitude of effect when all psychosocial factors were included in the regression model, our findings indicated an independent effect of bullying on CMD.

There are few studies focusing on biological mechanisms that explain the association between workplace bullying and mental health37. A higher level of salivary corti-
## Appendix Table 2. Comparison of respondents and non-respondents, according to sociodemographic and occupational characteristics

|                                       | Respondents | Non Respondents | Total Population |
|---------------------------------------|-------------|-----------------|------------------|
|                                       | Labour Court | Federal Court | Electoral Court | Total | Labour Court | Federal Court | Electoral Court | Total |
|                                       | n=405       | n=125          | n=176            | n=201 | n=428        | n=82          | n=186            | n=333 |
| Respondent rate                       | 48.6        | 38.8           | 20.4             | 51.9  | 40.3         | 1.183         | 38.7             | 1.90  |
| Sex                                   |             |                |                  |       |              |              |                  |       |
| Male                                  | 191 (47.2)  | 57 (45.6)      | 92 (52.3)        | 98 (48.8) | 222 (51.9) | 453 (51.4) | 110 (59.1) | 785 (52.5) |
| Female                                | 214 (52.8)  | 68 (54.4)      | 84 (47.7)        | 103 (51.2) | 206 (48.1) | 429 (48.6) | 76 (40.9) | 711 (47.5) |
|                                       |             |                |                  |       |              |              |                  |       |
| Age group                             |             |                |                  |       | 0.047        |              |                  |       |
| <35                                   | 77 (19.0)   | 25 (20.0)      | 22 (12.5)        | 12 (6.0) | 139 (32.5) | 249 (28.2) | 39 (17.7) | 447 (29.9) |
| 35-44                                 | 130 (32.1)  | 90 (40.9)      | 44 (25.6)        | 72 (39.8) | 112 (26.2) | 352 (39.9) | 79 (33.4) | 543 (36.3) |
| 45-54                                 | 118 (34.1)  | 39 (12.2)      | 74 (48.2)        | 78 (53.6) | 144 (33.6) | 246 (27.9) | 45 (24.2) | 535 (36.3) |
| >=55                                  | 60 (14.8)   | 11 (3.8)       | 36 (20.9)        | 39 (19.4) | 33 (7.7)   | 35 (4.0)    | 3 (1.6)   | 71 (4.7)   |
|                                       |             |                |                  |       | 0.001        |              |                  |       |
| Skin Colour                           |             |                |                  |       | 0.705        |              |                  |       |
| White                                 | 375 (92.6)  | 114 (91.2)     | 161 (91.5)       | 184 (91.5) | 398 (93.0) | 803 (91.0) | 168 (90.3) | 1,369 (91.5) |
| Black, Brown, Asian, Indigenous       | 30 (7.4)    | 11 (8.8)       | 15 (8.5)         | 17 (8.5)   | 30 (7.0)   | 79 (9.0)   | 18 (9.7)  | 204 (13.6)  |
| Educational level                     |             |                |                  |       | 0.001        |              |                  |       |
| Postgraduate, MSc, PhD                | 235 (58.0)  | 68 (54.4)      | 102 (58.0)       | 127 (63.2) | 165 (38.5) | 510 (60.1) | 39 (21.0) | 734 (49.1)  |
| Graduate                              | 141 (34.8)  | 45 (36.0)      | 58 (32.9)        | 57 (28.4)   | 190 (44.4) | 278 (31.5) | 90 (48.8) | 558 (37.3)  |
| High School                           | 29 (7.2)    | 12 (9.6)       | 16 (9.1)         | 17 (8.5)   | 73 (17.1)   | 74 (8.4)    | 57 (30.6) | 204 (13.6)  |
| Field of expertise                    |             |                |                  |       | 0.011        |              |                  |       |
| Administrative (1st court)            | 52 (12.8)   | 30 (24.0)      | -                | 44 (21.9)   | 103 (24.1) | 181 (20.5) | 124 (60.7) | 408 (27.3)  |
| Administrative (2nd court)            | 92 (22.7)   | 16 (12.8)      | 77 (43.7)        | 108 (53.7) | 103 (24.1) | 181 (20.5) | 124 (60.7) | 408 (27.3)  |
| Judicial (1st court)                  | 132 (32.6)  | 87 (69.6)      | -                | 14 (7.0)    | 103 (24.1) | 181 (20.5) | 124 (60.7) | 408 (27.3)  |
| Judicial (2nd court)                  | 129 (31.9)  | 7 (5.6)        | 99 (56.3)        | 35 (17.4)   | 325 (75.9) | 701 (79.9) | 62 (33.3)  | 1,088 (72.7) |
|                                       |             |                |                  |       | 0.445        |              |                  |       |

**Response rate**: 48.6% (Respondents) vs 38.8% (Non Respondents)

**p-value**: 0.047 (Sex)
sol in bullied workers compared to those not bullied was described\(^{32}\), suggesting that workplace bullying could increase the biological stress, affecting inflammatory response and neurotransmission. Also, stress could generate negative emotions in those exposed to bullying, increasing the risk of health problems. Moreover, individuals who are exposed to bullying could face difficulties in dealing with their emotions, affecting negatively their psychological well-being\(^{43}\).

There is no consensus about the best way to operationalise workplace bullying\(^{26}\). In this paper, we used the ‘behavioural experience method’ based on the frequencies of each negative act reported on NAQ-r answers\(^{18}\). Using three types of negative acts categorisation – as we did in our analyses – can be a tool to better understand the role of workplace bullying on mental health outcomes. Repeated measures of bullying in workplace surveillance (either in longitudinal/follow-up or in repeated measures studies) could also improve the understanding of bullying process, its escalating process, and its consequences for health. The cut-off score “\( \geq 45 \)” provides a more specific measure for workplace bullying\(^{24}\) when compared to other types of categorisation. However, a possible deleterious effect of the negative acts on CMD was found even in levels not classified as severe workplace bullying (scores 33 to 45, or “now and then” and “monthly” frequencies). These facts and the positive dose-response in the association between negative acts and CMD may indicate that not only persistent and severe workplace bullying has terrible consequences for workers and organisations, but also negative acts or violent behaviours not characterised as bullying by the scales. These findings are also in line with previous studies\(^{26}\). As an escalating process\(^{18}\), bullying might require interventions in early stages of conflicts, when negative acts might be less frequent. Alternative categorisations to measure the exposure to bullying (such as identifying 5 categories of exposure to negative acts) might be helpful to address these issues and to verify dose-response patterns.

Some limitations of this study should also be discussed. Although the “behavioural experience method” to measure bullying is based on self-report and may have limitations\(^{32}\), the NAQ-r provides valid and “objective” information on the frequencies of negative acts. Despite the criticism raised on using an operational criterion, this approach is based in solid theoretical assumptions and enables comparisons with most of the previous studies on the theme\(^{25, 39}\), with measures that are easy to interpret. In order to address a possible problem of not identifying cases of bullying in those experiencing hostile behaviours “monthly” or “now and then”, we also included a five-categories measure of the exposure, what make possible to identify less frequent negative acts and their effects.

The reverse causality of the association between workplace bullying and CMD is minimised by the fact that the recall of negative acts is 6 months, while for CMD is 30 days. However, we could not evaluate the previous mental health status of participants, thus reverse causation cannot be excluded. This study lacks an optimal response rate and found some statistically significant differences between respondents and non-respondents, suggesting a selection bias. However, the response rate in this study is similar to other web surveys\(^{40}\), and several other occupational health studies. Despite the relevance of workplace bullying, the problem is often neglected in institutions, leading workers to feel embarrassed or even coerced into not answering survey questionnaires. Unrepresentative samples tend to overestimate the prevalence of workplace bullying\(^{38}\), but associations are less affected by this bias. Also, with the high effect magnitude, the dose-response pattern found in the association between bullying and CMD, as well as the biological plausibility and consistency with the literature, the validity of our findings is reinforced.

The subjects of our study belong to a group of wealthy civil servants, with a stable job in the Brazilian state, in which the likelihood of leaving the job is very low. However, severe cases of mental disorders tend to cause long-term sick-leaves. Indeed, mental health problems are one of the main causes of sick leave among Brazilian civil servants\(^{45}\). Therefore, the associations might be underestimated due to the healthy worker effect.

**Conclusions**

Our study makes an important contribution to understanding the relationship between bullying and common mental disorders, especially in low- and middle-income countries like Brazil, where there is a lack of epidemiological evidence relating to the subject. Our findings reinforce the strong association between bullying at work and common mental disorders, and highlight the necessity of preventing bullying to reduce mental health problems and other health outcomes. We were able to measure and adjust the analysis for several demographic and occupational characteristics – including a range of psychosocial aspects – with validated tools and different logistic regression models – strengthening the validity of our results.

Interventions to prevent workplace bullying and CMD should address work processes and work organisation, re-
Reducing the job strain, the imbalance between efforts and rewards, and developing a safe psychosocial environment in the organisation. The administration of the Federal Judiciary of Brazil must provide appropriate capacitation for managers and leaders, developing occupational health actions to reduce the pressure for goals, the number of extra hours, the psychological demands, and to improve the autonomy, the social support and the institutional commitment to safe work environment.

Our findings are valuable for future comparisons with other populations and groups of workers in Brazil and other countries, suggesting different ways of categorising bullying, as well as different ways of modelling the analyses. Researchers should be encouraged to study the effects of bullying on mental health in an epidemiological perspective, including other psychosocial factors at work – such as job strain, effort-reward imbalance and psychosocial safety climate – as possible confounders and/or mediators. Further epidemiological studies to evaluate the effect of bullying on health, particularly those with longitudinal design, are still necessary in low- and middle-income countries, and should also investigate other settings. Future research on bullying and mental health should clarify a possible bi-directional relationship between workplace bullying and mental health problems.

References

1) Goldberg D, Huxley P (1992) Common Mental Disorders: A Biosocial model. 1st Ed., Tavistock/Routledge, London.
2) Steel Z, Marnane C, Iranpour C, Chey T, Jackson JW, Patel V, Silove D (2014) The global prevalence of common mental disorders: a systematic review and meta-analysis 1980-2013. Int J Epidemiol 43, 476–93.
3) Moraes RSM, Silva DAS, Oliveira WF, Peres MA (2017) Social inequalities in the prevalence of common mental disorders in adults: a population-based study in Southern Brazil. Rev Bras Epidemiol 20, 43–56.
4) Andrade LH, Wang YP, Andreoni S, Silveira CM, Alexandrino-Silva C, Siu ER, Nishimura R, Anthony JC, Gattaz WF, Kessler RC, Viana MC (2012) Mental Disorders in Megacities: findings from the São Paulo Megacity Mental Health Survey, Brazil. PLos One 7, e31879.
5) Diêlio AS, Facchini LA, Tomasi E, Silva SM, Thumé E, Piccini RX, Silveira DS, Maia MFS, Siqueira VF, Jardim VMR, Lemôes MAM, Borges CLS (2012) Prevalence of minor psychiatric disorders among primary healthcare workers in the South and Northeast regions of Brazil. Cad Saúde Pública 28, 503–14 (in Portuguese).
6) Braga LC, Carvalho LR, Binder MCP (2010) [Working conditions and common mental disorder among primary health care workers from Botucatu, São Paulo State.] Ciênc Saúde Coletiva 15, 1585–96 (in Portuguese).
7) Reis EJFB, Carvalho TM, Araújo TM, Porto LA, Silvany Neto AM (2005) [Work and psychological distress among public school teachers in Vitória da Conquista, Bahia State, Brazil.] Cad. Saúde Pública 21, 1480–90 (in Portuguese).
8) Nunes MA, Pinheiro AP, Bessel M, Brunoni AR, Kemp AH, Benseñor IM, Chor D, Barreto S, Schmidt MI (2016) Common mental disorders and sociodemographic characteristics: baseline findings of the Brazilian Longitudinal Study of Adult Health (ELSA-Brasil). Br J Psychiatry 38, 91–7.
9) Stansfeld SA, Fuhrer R, Shipley MJ, Marmot MG (1999) Work characteristics predict psychiatric disorder: prospective results from the Whitehall II Study. Occup Environ Med 56, 302–7.
10) World Health Organization (WHO). The World Health Report. Mental health: new understanding 2001 http://who.int/whr/2001/en/whr01_en.pdf. Accessed May 4, 2017.
11) GBD 2016 disease and injury incidence and prevalence collaborators (2016) Global, regional, and national incidence, prevalence, and years lived with disability for 328 diseases and injuries for 195 countries, 1990-2016: a systematic analysis for the Global Burden of Disease Study 2016. Lancet 390, 1211–59.
12) Duijts SF, Kant I, Swaen GM, Van Den Brandt PA, Zeegers MP (2007) A meta-analysis of observational studies identifies predictors of sickness absence. J Clin Epidemiol 60, 1105–15.
13) Cunha JB, Blank VL, Boing AF (2009) [Time trends of sick leave in Brazilian civil servants (1995-2005).] Rev Bras Epidemiol 12, 226–36 (in Portuguese).
14) Harvey SB, Modini M, Joyce S, Milligan-Saville JS, Tan L, Mykletun A, Bryant RA, Christensen H, Mitchell PB (2017) Can work make you mentally ill? A systematic meta-review of work-related risk factors for common mental health problems. Occup Environ Med 74, 301–10
15) Bonde JP, Gullander M, Hansen AM, Grynderup M, Persson R, Hogh A, and Kolstad HA (2016) Health correlates of workplace bullying: a 3-wave prospective follow-up study. Scand J Work Environ Health 42, 17–25.
16) Verkuil B, Atasayi S, Molendijk ML (2015) Workplace bullying and mental health: a meta-analysis on cross-sectional and longitudinal data. PLoS ONE 10, e0135225.
17) Nielsen MB, Magnorøy N, Gjerstad J, Einarsen S (2014) Workplace bullying and subsequent health problems. Tidsskr Nor Legeforen 12, 1233–8.
18) Einarsen S, Hoel H, Zapf D and Cooper CL (2020) The Concept of Bullying and Harassment at Work: The European Tradition. In: Einarsen SV, Hoel H, Zapf D, Cooper CL (Eds.). Bullying and Harassment in the Workplace: Theory, Research and Practice (3rd Ed.). Routledge.
19) Theorell T, Hammarstrom A, Aroonsson G, Traskman B, Grape T, Hogstedt C, Marteinsdottir I, Skoog I, Hall C (2015) A systematic review including meta-analysis of work environment and depressive symptoms. BMC Public
20) Einarsen S, Nielsen MB (2015) Workplace bullying as an antecedent of mental health problems: a five-year prospective and representative study. Int Arch Occup Environ Health 88, 131–42.

21) Lahelma E, Lallukka T, Laaksonen M, Saastamoinen P, Rahkonen O (2012) Workplace bullying and common mental disorders: a follow-up study. J Epidemiol Community Health 66, e3.

22) Grimard CM, Lee LT (2020) Cross-cultural Perspectives of Workplace Bullying. In: Einarsen SV, Hoel H, Zapf D, Cooper CL (Eds.). Bullying and Harassment in the Workplace: Theory, Research and Practice (3rd Ed.). Routledge.

23) Mari JJ, Williams P (1986) A validity study of a psychiatric screening questionnaire (SRQ-20) in primary care in the city of São Paulo. Br J Psychiatry 148, 23–6.

24) Einarsen S, Hoel H, Notelaers G (2009) Measuring exposure to bullying and harassment at work: validity, factor structure and psychometric properties of the Negative Acts Questionnaire-Revised. Work & Stress 23, 24–44.

25) Zapf D, Escartin J, Scheppa-Lahyani M, Einarsen SV, Hoel H, Vartia M (2020) Empirical Findings on Prevalence and Risk Groups of Bullying in the Workplace. In: Einarsen SV, Hoel H, Zapf D, Cooper CL (Eds.). Bullying and Harassment in the Workplace: Theory, Research and Practice (3rd Ed.). Routledge.

26) Notelaers G, Einarsen S (2012) The world turns at 33 and 45: defining simple cutoff scores for the Negative Acts Questionnaire–Revised in a representative sample. Eur J Work Organ Psychol 22, 670–82.

27) Alves MGM, Chor D, Faerstein E, Lopes CS, Werneck GL (2004) [Short version of the “job stress scale”: a Portuguese-language adaptation.] Rev Saúde Pública 38, 164–71 (in Portuguese).

28) Chor D, Werneck GL, Faerstein E, Alves MGM, Rotenberg L (2008) The Brazilian version of the effort-reward imbalance questionnaire to assess job stress. Cad Saúde Pública 24, 219–24.

29) Theorell T (1996) The demand-control-support model for studying health in relation to the work environment: an interactive model. In: Orth-Gomer, K.; Scheneiderman, editors. Behavioral medicine approaches to cardiovascular disease. Mahwah, NJ: Lawrence Erlbaum Associates, 69–85.

30) Siegrist J (1996) Adverse health effects of high-effort: low reward conditions at work. J Occup Health Psychol 1, 27–41.

31) Siegrist J, Starke D, Chandola T, Godin I, Marmot M, Niedhammer I, Peter R (2004) The measurement of ‘effort’-‘reward’ imbalance at work: European comparisons. Soc Sci Med 58, 1483–99.

32) Hall GB, Dollard MF, Coward J (2010) Psychosocial safety climate: development of the PSC-12. Int J Stress Manag 4, 353–83.

33) Bailey TS, Dollard MF, Richards PA (2015) A national standard for psychosocial safety climate (PSC): PSC 41 as the benchmark for low risk of job strain and depressive symptoms. J Occup Health Psychol 20, 15–26.

34) Araujo JMG (2011) Adequabilidade e Evidências Psicométricas de uma Escala de Personalidade Baseada no Big Five Inventory-10 a uma Região do Sul do Brasil. Universidade Católica de Pelotas. Pelotas. Dissertação de Mestrado. (in Portuguese)

35) Rammstedt B, John OP (2007) Measuring personality in one minute or less: a 10 item short version of the Big Five Inventory in English and German. J Res Pers 41, 203–12.

36) Lopes CS, Moraes CL, Junger WL, Werneck GL, Ponce de Leon AC, Faerstein E (2015) Direct and indirect exposure to violence and psychological distress among civil servants in Rio de Janeiro, Brazil: a prospective cohort study. BMC Psychiatry 15, 109.

37) Coutinho LMS, Matijasevich A, Szuzafka M, Menezes PR (2014) [Prevalence of common mental disorders and the relationship to the social context: multilevel analysis of the São Paulo Ageing & Health Study (SPAH).] Cad. Saúde Pública 30, 1875–83 (in Portuguese).

38) Nielsen MB, Matthiesen SB, Einarsen S (2010) The impact of methodological moderators on prevalence rates of workplace bullying. A meta-analysis. J Occup Organ Psychol 83, 955–79.

39) Boudrias V, Trépanier SG, Salin D (2021) A systematic review of research on the longitudinal consequences of workplace bullying and the mechanisms involved. Aggress Violent Behav 56, 101508.

40) Barreto M, Heloani R (2015) [Violence, health and labor: intolerance and bullying in labor relationships.] Serv Soc Violent Behav 8, e3.

41) Vie TL, Glaso L, Einarsen S (2012) How does it feel? Psychological impact of workplace bullying, emotions and musculoskeletal complaints. Scand J Psychol 53, 165–73.

42) Hansen ÂM, Høgh A, Persson, R (2011) Frequency of bullying at work, physiological response, and mental health. J Psychosom Res 70, 19–27.

43) Blumenberg C, Barros AJD (2018) Response rate differences between web and alternative data collection methods for public health research: a systematic review of the literature. Int J Public Health 63, 765–73

45) Silva Junior JS, Fischer FM (2014) Disability due to mental illness: social security benefits in Brazil 2008–2011. Rev Saúde Pública 48, 186–90.