Beck, Jorge Augusto; Pitta, Ana Maria Fernandes; Bonfim, Camila Barreto;
Christovam, Barbara Pompeu; Machado, Ana Carolina; Guimarães, Lara
Freitas; Hora, Tatiane; Brito, Luciara Leite; Maia, Helena Maria Silveira Fraga

Associação entre sintomas depressivos e inatividade física em trabalhadores técnico-
administrativos de uma universidade pública do Nordeste do Brasil: estudo transversal

Jorge Augusto Beck Filho[a]
 https://orcid.org/0000-0003-1576-7426
Ana Maria Fernandes Pitta[b]
 https://orcid.org/0000-0003-2558-5757
Camila Barreto Bonfim[c]
 https://orcid.org/0000-0001-8361-6721
Barbara Pompeu Christovam[d]
 https://orcid.org/0000-0002-9135-8379
Ana Carolina Machado[e]
 https://orcid.org/0000-0001-5978-7790
Lara Freitas Guimarães[f]
 https://orcid.org/0000-0002-6747-2964
Tatiane Hora[a]
 https://orcid.org/0000-0002-2335-3963
Luciara Leite Brito[g]
 https://orcid.org/0000-0002-9441-0523
Helena Maria Silveira Fraga Maia[a]
 https://orcid.org/0000-0002-2782-4910

[a]Universidade do Estado da Bahia,
Departamento de Ciências da Vida.
Salvador, BA, Brazil.

[b]Universidade Católica do Salvador,
Programa de Pós-Graduação em Políticas
Sociais e Cidadania. Salvador, BA, Brazil.

[c]Universidade do Estado da Bahia,
Departamento de Educação. Salvador,
BA, Brazil.

[d]Universidade Federal Fluminense,
Escola de Enfermagem Aurora de Afonso
Costa, Departamento de Fundamentos
de Enfermagem e Administração.
Niterói, RJ, Brazil.

[e]Universidade Estadual de Santa Cruz,
Departamento de Ciências da Saúde.
Ilhéus, BA, Brazil.

[f]Escola Estadual de Saúde Pública Professor
Francisco Peixoto de Magalhães Netto,
Comissões de Residência Multiprofissional.
Salvador, BA, Brazil.

[g]Universidade Federal da Bahia, Faculdade
de Nutrição. Salvador, BA, Brazil.

Correspondence:
Jorge Augusto Beck Filho
Email:
jbeck@uneb.br

Association between depressive symptoms and physical inactivity in technical-administrative workers from a public university in Northeast Brazil: a cross-sectional study

Associação entre sintomas depressivos e inatividade física em trabalhadores técnico-administrativos de uma universidade pública do Nordeste do Brasil: estudo transversal

Abstract

Objective: to investigate the association between depressive symptoms and physical inactivity in technical-administrative workers from a public university in the Northeast of Brazil. *Methods:* cross-sectional study. We assessed depressive symptoms and physical activity using, respectively, the Patient Health Questionnaire-9, and the International Physical Activity Questionnaire. We used Poisson regression analysis, and estimated the prevalence ratios (PR) and their respective 95%CI. *Results:* 301 workers participated, of which 71.1% were female. The prevalence of depressive symptoms was of 25.7%, and 52.0% of the workers declared being physically inactive. Depressive symptoms and physical inactivity were associated to the effect modifiers "time worked to the institution ≤ 15 years" (PR: 3.03; 95%CI: 1.05;9.16) e "work position at administrative sectors" (PR: 1.90; 95%CI: 1.14;3.18). *Conclusion:* the results evidence the association between depressive symptoms and physical inactivity in technical-administrative workers of a public university of the state of Bahia. The the main factor associated are time worked to the institution and work position at administrative sectors.

Keywords: *occupational health; depression; musculoskeletal system; sedentary behavior; cross-sectional studies.*

Resumo

Objetivo: *investigar a associação entre sintomas depressivos e inatividade física em trabalhadores técnico-administrativos de uma universidade pública do Nordeste do Brasil.* Métodos: *estudo transversal realizado no estado da Bahia. Os sintomas depressivos foram avaliados pelo* Patient Health Questionnaire-9 *e o nível de atividade física pelo* International Physical Activity Questionnaire. *Foi realizada análise de regressão de Poisson e estimadas as razões de prevalência (RP) e seus respectivos IC95%.* Resultados: *301 servidores participaram do estudo, dos quais 71,1% do sexo feminino. A prevalência de sintomas depressivos foi de 25,7% e 52,0% dos servidores declararam ser fisicamente inativos. Sintomas depressivos e inatividade física se mostraram associados com os modificadores de efeito "tempo de trabalho na instituição ≤ 15 anos" (RP: 3,03; IC95%: 1,05;9,16) e "lotação em setores administrativos" (RP: 1,90; IC95%: 1,14;3,18).* Conclusão: *os resultados evidenciam a associação entre sintomas depressivos e inatividade física em trabalhadores técnico-administrativos de uma universidade pública do estado da Bahia, tendo como principais fatores associados o tempo de trabalho na instituição e a lotação do servidor.*

Palavras-chave: *saúde do trabalhador; depressão; sistema musculoesquelético; comportamento sedentário; estudos transversais.*

Introduction

Depression is a psychological disorder derived from the combination of genetic, biological, psychological, and environmental factors characterized by the occurrence of varied symptoms, such as deep sadness, loss of interest in previously pleasurable activities, isolation, pessimism, low self-esteem, difficulty concentrating, irritability, feeling of worthlessness, and recurrent thoughts of death that can lead to suicide[1]. Accompanied by other cognitive, behavioral and neurovegetative symptoms, which significantly affect the individual's functional capacity, depression is associated with high disability and loss of social skills, with high economic and emotional costs, representing one of the most serious public health problems today for global society[1-3].

Data from 2017 from the World Health Organization (WHO) indicate that the estimated total number of people living with depression worldwide is more than 322 million, showing an increase of 18.4% between 2005 and 2015, reflection of global population growth, as well as the age groups in which depression is more prevalent[4]. In Brazil, according to results from the National Health Survey (PNS), in 2019, 16.3 million people over the age of 18 suffered from the disease—with an increase of 34.2% between 2013 and 2019. States in the country's South and Southeast regions recorded the highest prevalence of depression (15.2% and 11.5%, respectively), followed by the Midwest (10.4%), Northeast (6.9%), and North (5%) regions[5]. Between 2012 and 2016, 1,020,010 sickness benefits were granted in Brazil, classified as due to mental and behavioral disorders. Of these, 37.6% were classified as depressive episodes or recurrent depressive disorder, 5.2% being work-related[6].

In the context of work, psychological distress can be directly related to experiences with organizational management, with a combination of aspects— high workload, task complexity, professional dissatisfaction due to the lack of recognition of performance by managers and work colleagues, difficulties in professional advancement, among others. In this way, the different situations present in the work environment, associated with constant frustrations, constitute potential risks of influence for the genesis of suffering and mental illness, which can affect the worker's personal and professional life[7-10].

Traditional treatment for depression, which includes the integration of drugs and psychotherapy, effective in many situations, faces major challenges given the high diagnostic complexity represented by the variation in its symptoms, as well as the presence of adverse effects and, often, due to its difficult access[2,11]. Therefore, physical activity, defined as any body movement produced by the musculoskeletal system that demands energy expenditure above resting levels, is identified by the WHO as an important promoter of individual gains in physical and mental health, constituting one of the main supporting agents in combating and controlling chronic non-communicable diseases (NCDs), including depression[1,2,11,12].

Depressive symptoms and physical inactivity in technical-administrative workers are of great magnitude and, separately, have already been the subject of several publications[3,7-9,13-18]. However, their association, also considering the presence of concomitant chronic diseases and physical limitations, had not yet been reported for this specific population in the Brazilian Northeast. Thus, this study aimed to investigate the association between depressive symptoms and physical inactivity in technical-administrative workers at a public university in Northeast Brazil.

Methods

Study design and context

This is a cross-sectional, analytical epidemiological study, carried out with technical-administrative workers working at a public university in the state of Bahia.

This institution was created in 1983 and is structured in the multi-campus system. It has 29 departments located on 24 campuses distributed in 23 important medium and large municipalities in Bahia, offering more than 150 in-person and distance learning courses, with approximately 22,500 students. Campus I, the largest and oldest, is located in Salvador, BA, and has 4 departments, with 27 undergraduate and 8 postgraduate courses.

Participants

Employees who had worked in the role for at least 1 year and voluntarily agreed to respond to the research instrument were included, after acknowledging and signing the free and informed consent form. Those who were on vacation or leave, interns, pregnant women and those who were not located at their jobs or refused to schedule an interview on more than two occasions were excluded.

Study size

To calculate the sample size, we considered the total number of 715 active, permanent, and outsourced public servants, hired as support professionals, technicians, and university analysts, stationed at Campus I, in Salvador, BA. The prevalence of depressive symptoms of 34.2%[5], study power of 80%, and design effect of 1 were used as a parameter for this calculation. With these parameters, the estimated sample number was 233 workers. Due to possible losses and refusals, this amount was increased by 10%, totaling 256 workers. Calculations were performed using the OpenEpi statistical package.

Data collection

Primary data were collected with the application of questionnaires, via in-person interviews, conducted by researchers participating in the study. The interviews were scheduled at a time convenient for the worker, from November 2018 to December 2019. After this initial stage, everyone was invited to participate in the anthropometric assessment carried out by interviewers trained specifically for this purpose and collection of biological material for assessment of fasting blood glucose. A pilot study was carried out with technical-administrative employees from another higher education institution, with the aim of testing understanding of the questionnaire questions, as well as training researchers in its administration.

Variables and measurement

The block of sociodemographic variables included: sex (female or male), age (18-39 years or ≥40 years), skin color (white, black or mixed race, self-declared and classified according to the Brazilian Institute of Geography and Statistics – IBGE), education (*stricto sensu* postgraduate, undergraduate, or primary or secondary education), whether currently studying (yes or no), marital status (with or without a partner), and monthly income (>R$ 2,800.00 or ≤R $ 2,800.00), taking as a reference the average income of the salary and benefits table established by the Prorectorate of People Management and Development of the Universidade do Estado da Bahia (PGDP-Uneb) at the time of collection.

Occupational variables included: time worked at the institution (>15 years or ≤15 years, according to previous studies on the health of technical-administrative workers[17,18]),

professional relationship (permanent or outsourced/ commissioned), employment sector (central administration or academic sectors) and if the worker held, during the period of data collection, any leadership position (yes or no).

To evaluate the items organization and working conditions and the workers' socio-professional relationships, the following variables from the Work Context Assessment Scale (EACT) were used: existence of strict standards for carrying out tasks; insufficient people to carry out tasks; existence of professional disputes in the workplace; lack of time to take rest breaks; existence of division between those who plan and those who carry out the tasks; and unfair distribution of work tasks—all of which were analyzed dichotomously[19].

With the aim of evaluating health conditions that could be related to the presence of depressive symptoms, the occurrence of musculoskeletal pain, systemic arterial hypertension, and diabetes mellitus were included. To this end, the *Nordic Musculoskeletal Questionnaire* (NMQ) was applied, which is not indicated as a basis for clinical diagnosis, but rather for identifying musculoskeletal symptoms, therefore constituting an important tool for diagnosing the work environment for developing preventive measures, reporting the occurrence of symptoms considering the 12 months and 7 days prior to the interview, as well as absences from routine activities in the last year. The anatomical regions questioned were: neck, shoulders, back (upper part), elbows, wrists/hands, back (lower part), hips/thighs, knees and ankles/feet [20]. In our study, the presence of musculoskeletal symptoms was considered to be their occurrence in the last 12 months (yes or no).

To assess blood pressure, three measurements were taken by the same researcher, all on the left arm, respecting a 1-minute interval between them. Those whose mean pressure measurements were equal to or greater than 140 mmHg for systolic and 90 mmHg for diastolic [21] were classified as hypertensive. Those whose test showed a fasting blood glucose reference value ≥126 mg/dL[22] were considered diabetic. To identify the presence of an eating disorder, binge eating was assessed using a questionnaire based on the Structured Clinical Interview for DSM-IV-SCID-I/P for the diagnoses of bulimia nervosa (BN) and binge eating disorder (BED)[23].

To investigate the mental health situation, the Patient Health Questionnaire-9 (PHQ-9) instrument was used, which aims to assess the suspicion of depressive symptoms, such as mood,

change in appetite or weight, feelings of guilt or worthlessness, feeling unusually slow or restless, problems concentrating, and suicidal thoughts. The PHQ-9 consists of 9 items, with scores that can vary from 0 to 27 points in total. The frequency of each symptom in the last 2 weeks is evaluated on a Likert scale from 0 to 3, corresponding to the answers "none of the time," "several days," "more than half of the days," and "almost every day," respectively. The analysis is carried out considering the total score of the responses, and participants who scored ≥10 were identified as having suspected depressive symptoms. The questionnaire also includes a 10th question that assesses the interference of these symptoms in performing daily activities, such as working and studying. This is a quickly applicable instrument, which can be self-administered, being an advantage in epidemiological studies thanks to its sensitivity and specificity[24]. We also investigated how workers assessed their quality of life, as well as their health level, with answers categorized as "good/very good" and "fair/bad/very bad".

Regarding lifestyle habits, the following variables were included: current smoking (yes or no, considering at least one cigarette in the last 30 days prior to the research), abusive use of alcoholic beverages—measured with the application of the Alcohol Use Disorders Identification Test (Audit), an instrument developed by the WHO[25], with cut-off points of <8 for abstinent or occasional drinkers and ≥8 points for those who drank abusively or presented risky consumption—and physical inactivity, measured with the International Physical Activity Questionnaire (Ipaq)[26] instrument.

Despite scientifically validated recommendations regarding the need to perform regular activities of moderate or vigorous intensity to promote cardiovascular and metabolic health, different categorizations with a significant reduction in physical activity time for acute benefits are already corroborated by researchers who emphasize that carrying them out for at least 10 minutes a day can have a positive impact on reducing physical and psychological suffering[11,15]. Gaining confidence, social interaction and awareness of adopting a healthier way of life and, therefore, repercussions on well-being and quality of life[2,16] are expected effects with this practice. Thus, the physical inactivity variable was defined categorically, considering as active those who reported physical activity for ≥10 minutes per day. It is worth noting that all instruments used in this investigation were validated for use in the Brazilian context.

Bias control

To reduce the possibility of information bias, a multi-professional, interdisciplinary team was trained to apply instruments validated for Brazilian Portuguese. Furthermore, after carrying out the pilot study, concordance between interviewers was assessed by calculating the Kappa index, with an obtained value of 0.78, indicating substantial agreement. To avoid losses in the study, meetings were held with representatives of the provost's offices and other institutional sectors and with employees at their workplaces, in addition to displaying posters at each interview location, indicating rooms reserved for collection of primary data and biological material, and new appointments in case of non-attendance on scheduled dates.

Statistical analyses

The data were tabulated in Microsoft Excel and the analyses were conducted using the statistical package Stata (v. 14.0), through which corrections and inconsistencies were eliminated. The descriptive analysis identified the general and specific characteristics of the studied population and allowed comparing the prevalence of depressive symptoms and physical inactivity according to the characteristics found. Dichotomous variables were compared by the Pearson's chi-squared test (χ^2). In the stratified analysis, the magnitude of the crude and adjusted association was obtained using the Mantel and Haenszel[27] method, in which the prevalence ratio (PR) was estimated, with the respective 95% confidence interval (95%CI).

In the multivariable analysis, Poisson regression was used as the event in question was common (>10%)[28]. The backwards procedure was used to enter the variables. The modeling began with all independent variables that presented a value of p≤0.20 in the crude analysis and the products identified in the stratified analysis (p≤0.05). Confounding was assessed using the percentage change (≥10%) in the main association measure.

Ethical considerations

The data for this study come from the Health Conditions of Technical-Administrative Workers Project at a Universidade Pública do Estado da Bahia – COSTTA Study, approved by the Research Ethics Committee of the Universidade Católica do Salvador, CAAE 7498.5617.2.20000.5628, 14 of September 2017, opinion no. 2,274,916, and all ethical precepts were assessed in accordance with the standards

of Resolution no. 466/2012 of the National Health Council. All participants were informed about the risks and benefits of the research and signed the informed consent form.

Results

A total of 348 employees met the eligibility criteria and were invited to participate in the study. Among these, 38 (10.9%) did not attend the scheduled interviews and 9 (2.6%) withdrew from participating. Thus, the sample studied was composed of 301 employees, representing 17.5% more than the calculated sample number plus 10% (256 employees). Among the participants, 77 (25.7%) had depressive symptoms and 156 (52.0%) declared to be physically inactive. In the crude analysis, there was no significant association between depressive symptoms and physical inactivity (PR: 1.30; 95%CI: 0.88;1.93; p=0.19).

The sociodemographic and occupational characteristics and the prevalence of physical inactivity in each stratum are described in **Table 1**. The study population was mostly made up of female employees (71.1%); young people between 18 and 39 years old (52.5%); with higher education, that is, with an undergraduate and/or postgraduate degree (59.6%); who were not studying at the time of collection (66.8%); and who self-declared as black or brown (84.3%). Regarding occupational characteristics, employees with income of up to R$ 2,800.00 (72.8%) predominated; with a non-staff employment (54.5%); up to 15 years of time worked (70.8%); working at central administration (69.3%); who did not hold management positions (77.7%); and did not face situations of professional disputes in the workplace (82.4%) or unfair distribution of tasks (81.4%); no excessive pace of work (76.4%), insufficient consumables (52.2%); or noise in the work environment (83.1%). Each of these strata presented different prevalence of physical inactivity, with higher and statistically significant frequencies observed among male individuals (64.4%, p<0.001). Differences in other strata were not statistically significant.

In **Table 2** clinical characteristics and lifestyle habits are described, as well as their association with physical inactivity among employees. It was observed that most servers did not smoke (93.0%); did not consume alcoholic beverages abusively (82.1%); had no diagnosis of diabetes mellitus (93.0%), hypertension (76.7%), binge eating disorder (79.4%) or depressive symptoms (74.4%), but had musculoskeletal disorders (87.0 %); they considered their quality of life to be good or very good (52.5%) and their self-perceived health was good or very good (60.3%). The highest prevalence of physical inactivity was observed among those who considered their quality of life to be good or very good (56.3%, p<0.01) and those who self-perceived as healthy or very healthy (56.4%, p< 0.001). The other strata evaluated did not show statistical significance.

Considering the Breslow-Day homogeneity test, the variables "time worked at the institution" and "work position" were identified as effect modifiers (p≤0.05). While in the modeling (**Table 3),** different regression models were evaluated for each stratum. In Model 1, stratified by time worked in years and adjusted for sex, income, education, and diabetes mellitus, it was observed that professionals with up to 15 years of work showed a strong and positive association between depressive symptoms and physical inactivity (PR: 3.03; 95%CI: 1.05;9.16 – Model 1b). Model 2 was stratified by work position and adjusted by income, education, and age. It was detected that, among professionals working at central administration (Model 2b), the association between depressive symptoms and physical inactivity was positive and statistically significant (RP: 1.90; 95% CI: 1.14;3.18), as shown in **Table 3**.

Table 1 Sociodemographic and occupational characteristics of technical-administrative workers at a public state university, according to physical inactivity, Salvador, BA, Brazil, 2018-2020 (n=348)

Characteristic	Physical Inactivity			
	n (%)	Yes (%)	No (%)	p-value*
Sex				
Male	87 (28.9)	56 (64.4)	31 (35.6)	
Female	214 (71.1)	89 (41.6)	125 (58.4)	**<0.001**
Age (years)				
18 to 39	158 (52.5)	73 (46.2)	85 (53.8)	
≥40	143 (47.5)	72 (50.4)	71 (49.6)	0.472
Education§				
Postgraduate *stricto sensu*	118 (39.3)	59 (50.0)	59 (50.0)	
Undergraduate	61 (20.3)	30 (49.2)	31 (50.8)	
Primary or Secondary Education	121 (40.4)	56 (46.3)	65 (53.7)	0.838
Currently studying				
No	201 (66.8)	98 (48.8)	103 (51.2)	
Yes	100 (33.2)	47 (47.0)	53 (53.0)	0.774
Skin color§				
White	47 (15.7)	22 (46.8)	25 (53.2)	
Black/mixed	253 (84.3)	123 (48.6)	130 (51.4)	0.820
Income (in R$)				
>2,800	82 (27.2)	44 (53.7)	38 (46.3)	
≤2,800	219 (72.8)	101 (46.1)	118 (53.9)	0.244
Professional status				
Staff	137 (45.5)	68 (49.6)	69 (50.4)	
Outsourced/commissioned	164 (54.5)	77 (47.0)	87 (53.0)	0.643
Time worked at institution (years)†				
≤15	208 (70.8)	105 (50.5)	103 (49.5)	
>15	86 (29.2)	35 (40.7)	51 (59.3)	0.127
Work position‡				
Academic sectors	91 (30.7)	38 (41.8)	53 (58.2)	
Central administration	205 (69.3)	104 (50.7)	101 (49.3)	0.154
Leadership position§				
No	233 (77.7)	108 (46.4)	125 (53.6)	
Yes	67 (22.3)	37 (55.2)	30 (44.8)	0.200
Professional disputes in the workplace				
No	248 (82.4)	114 (46.0)	134 (54.0)	
Yes	53 (17.6)	31 (58.5)	22 (41.5)	0.098
Unfair distribution of work task**s**				
No	245 (81.4)	115 (46.9)	130 (53.1)	
Yes	56 (18.6)	30 (53.6)	26 (46.4)	0.370
Excessive work pace				
No	230 (76.4)	109 (47.4)	121 (52.6)	
Yes	71 (23.6)	36 (50.7)	35 (49.3)	0.625
Insufficient office supplies				
No	157 (52.2)	74 (47.1)	83 (52.9)	
Yes	144 (47.8)	71 (49.3)	73 (50.7)	0.706
Noise in the work environment				
No	250 (83.1)	117 (46.8)	133 (53.2)	
Yes	51 (16.9)	28 (54.9)	23 (45.1)	0.291

* Pearson's chi-square; § Missing data: 1; † Missing data: 7; ‡ Missing data: 5.

Table 2 Clinical characteristics and lifestyle habits of technical-administrative workers of a public state university, according to physical inactivity, Salvador, BA, Brazil, 2018-2020 (n=348)

Characteristic	Physical Inactivity			
	n (%)	Yes (%)	No (%)	p-value*
Current smoking§				
No	279 (93.0)	131 (47.0)	148 (53.0)	
Yes	21 (7.0)	14 (66.7)	7 (33.3)	0.081
Abusive consumption of alcohol				
No	247 (82.1)	115 (46.6)	132 (53.4)	
Yes	54 (17.9)	30 (55.6)	24 (44.4)	0.231
Diabetes mellitus				
No	280 (93.0)	138 (49.3)	142 (50.7)	
Yes	21 (7.0)	7 (33.3)	14 (66.7)	0.158
Arterial hypertension				
No	231 (76.7)	117 (50.7)	114 (49.3)	
Yes	70 (23.3)	28 (40.0)	42 (60.0)	0.118
Binge eating disorder				
No	239 (79.4)	115 (48.1)	124 (51.9)	
Yes	62 (20.6)	30 (48.4)	32 (51.6)	0.970
Depressive symptoms				
No	224 (74.4)	113 (50.5)	111 (49.5)	
Yes	77 (25.6)	32 (41.6)	45 (58.4)	0.178
Musculoskeletal disorders[1]				
No	39 (13.0)	22 (56.4)	17 (43.6)	
Yes	261 (87.0)	122 (46.7)	139 (53.3)	0.260
Self-perceived quality of life				
Good/very good	158 (52.5)	89 (56.3)	69 (43.7)	
Regular/poor/very poor	143 (47.5)	56 (39.2)	87 (60.8)	**<0.01**
Self-perceived health[1]				
Good/very good	181 (60.3)	102 (56.4)	79 (43.6)	
Regular/poor/very poor	119 (39.7)	43 (36.1)	76 (63.9)	**<0.001**

*Pearson's chi-square; §Missing data: 1

Table 3 Poisson regression model of the association between depressive symptoms and physical inactivity among technical-administrative workers of a public state university, according to physical inactivity, Salvador, BA, Brazil, 2018-2020 (n=348)

Regression model	Association between symptoms depressive and inactivity physical		Adjusted p-Value †
	Crude PR (95% CI)	Adjusted PR (95%CI)	
Model 1 – Time in work (in years)*			
Model 1a (≤15)	3.66 (1.14 ; 11.70)	3.03 (1.05 ; 9.16)	**0.049**
Model 1b (>15)	1.05 (0.67;1.64)	0.88 (0.58 ; 1.33)	0.570
Model 2 – Assignment§			
Model 2a (Academic Sectors)	0.66 (0.07 ; 1.25)	0.58 (0.31 ; 1.09)	0.096
Model 2b (Central administration)	1.93 (1.15 ; 3.36)	1.90 (1.14 ; 3.18)	**0.013**

*Adjusted per sex, income, education, and diabetes mellitus; §Adjusted per income, education and age; PR: Prevalence Ratio; †: Wald test.

Discussion

In our study, among technical-administrative workers at a public university in the Northeast Region of Brazil, the variables "time worked in the institution" and "assignment" were identified as modifiers of effect, although no crude association was observed between depressive symptoms and physical inactivity. The results of the study highlight the association between depressive symptoms and physical inactivity in technical-administrative workers at a public university in the state of Bahia, with time worked and work position as the main associated factors. Among professionals with up to 15 years of work, as well as among those working in central administration, a strong and positive association was found between depressive symptoms and physical inactivity. This result can be justified by several factors, including the intense demand for services and the precariousness of physical and public management structures.

Similar investigations carried out with workers in this professional category corroborate the result found here regarding time worked at the institution[17,18]. An assessment of the sleep quality of technical-administrative education workers at the Universidade Federal de Juiz de Fora (UFJF), in the state of Minas Gerais, found that 56.9% of the employees had worked at the institution for up to 15 years, 42.1% were physically inactive, and 8.9% had depression[17]. A research investigating the prevalence and factors associated with the practice of physical activity among technical-administrative workers, at a public university in South Brazil, observed that 53.1% of employees had up to 14 years of work experience at the educational institution and 17.5% were physically inactive[18]. In this way, the possibility of poor adaptation of new employees to the routines and functions in public service, as well as the conditions and interpersonal relationships of daily work, especially for those who were on probation, can be highlighted as relevant aspects. Such factors, combined with inappropriate behavioral habits and difficulties in implementing actions to promote health and safety at work, can influence the subjects' mental health and act as triggers for common mental disorders[17,18].

Despite the association between depressive symptoms and physical inactivity in workers and time worked does not present satisfactory explanations in the literature, which makes more robust comparisons impossible, the existence of this phenomenon in the public service may be associated with other variables intrinsic and extrinsic to the work environment, which need to be investigated. Factors such as long hours of work, repetitive tasks, and their often unfair and inadequate distribution must be considered since they hinder workers from adopting healthy habits to protect their health. Similarly, good social, family and community coexistence, as well as fun and regular physical activity, need to be included as self-care factors in health.

In this study, being employed in central administration sectors was also associated with a higher frequency of depressive symptoms among those who did not practice physical activity. Notwithstanding the scarcity of studies regarding the association between depressive symptoms and physical inactivity in workers assigned to administrative sectors, the result obtained can be relatively explained by the fact that the jobs they perform are marked by pressure to comply with goals, deadlines, standards, rigid institutional regulations, and production results.

In agreement with this finding, Campelo[29] carried out an investigation in 11 administrative sectors of the central campus of the Universidade do Rio Grande do Norte (UFRN) to characterize working conditions and identify the occurrence of psychological distress among technical-administrative employees. Depression emerged first in the period from 2011 to 2014. Despite the existence of the Quality of Life at Work Program (PQVT) "Living in Harmony," which aims to promote the adoption of a healthier lifestyle among its employees, only 18% of those interviewed responded that they participated in one of the various activities proposed by the institutional program[29]. Likewise, Fernandes[14], in a study that aimed to verify the association between absenteeism-illness rates and the psychosocial variables of quality of life, perceived stress and job satisfaction, estimated significant prevalence of stress (51.7%), sedentary lifestyle (48.2%), and chronic diseases (25.2%) among technical-administrative workers working at the Provost's Office for People Management and Planning at the Universidade Federal do Rio Grande do Sul (UFRGS)[14], in 2019. Notably, the central administration is still responsible for coordinating, monitoring and permanently evaluating institutional programs, contracts, agreements and the like, in collaboration with other higher and sectoral administration bodies, among other responsibilities. The employees working in the academic sectors, on the other hand, are responsible for administrative and pedagogical assistance to the unit's management, course coordinators, departments, and teachers, as well as providing services to students and the external public. In this way, mental and behavioral disorders can be considered a response to pressures

from the organizational environment, which, in addition to impacting workers' personal and professional relationships, are important risk factors for NCDs, constituting one of the main causes of removal from work activities.

In this context, the practice of physical activity on a regular basis appears as a relevant ally to health given the stressful factors of the work routine, presenting itself as a factor of health protection, promotion, and recovery, due to its relationship with the individual's quality of life and well-being in aspects inherent to physical, mental, and cognitive health, consequently providing relief from stress and tensions arising from life in all its aspects. In addition to the robust scientific evidence related to the prevention of chronic diseases, such as cardiovascular conditions, practicing 150 to 300 minutes of physical activity per week also promotes a reduction in total and fractional cholesterol levels and glycemic levels, as well as an increase in metabolic demand and oxygen supply. Thus, universal recommendations reiterate the need to carry out regular activities of equivalent moderate or vigorous intensity. Evidence suggests that regular physical activity can reduce the risk of onset, severity, and relapse of depressive symptoms. It must be considered that, despite scientific indicators, the protective effect of physical activity—regarding the frequency, intensity and duration of its occurrence—is still inconsistent. Even though the WHO[30] recommendations for the practice of physical activity aiming at cardiovascular protection, studies indicate that any type of physical activity, including light activity, especially among adults with low fitness, performed as part of work, sport and leisure or transportation for at least 10 minutes a day, contribute to generating benefits and mitigating risks to individuals' health[2,11,15,16,30].

The current study has strengths and limitations. The relatively large and representative sample size can be seen as a strength of this investigation, as well as the appreciation of the practice of physical activity, even with limited time, as a self-care routine. Such results have implications for public health and can contribute to reducing physical inactivity, which is increasingly present in developed and developing countries.

The possibility of selection bias due to losses and refusals is considered a limitation of the study. However, it should be noted that this investigation's sample size exceeded the calculations initially carried out. Additionally, data regarding musculoskeletal discomfort in the last 12 months may have been underestimated due to recall bias. Furthermore, the fact of prioritizing the inclusion of those who were actively practicing the profession may characterize the occurrence of the healthy worker bias. In the same sense, the selection of the sample carried out solely at Campus I, in Salvador, BA, due to the embargo on continued data collection because of the COVID-19 pandemic, which began in Brazil in March 2020, can also be pointed out as a weakness of the study. In this way, the lack of data on technical-administrative workers from other university sites may contribute to not representing the magnitude of the problem at the institution. However, it should be noted that the headquarters located in the state capital is the one with the largest number of workers, both in the central administration and in academic sectors.

Considering that as this is a cross-sectional study, it is subject to reverse causality bias, and it is not possible to establish the temporality between the events investigated, such as physical inactivity, depressive, and musculoskeletal symptoms, related to lifestyle habits and clinical aspects.

Conclusion

The results of our study highlight the association between depressive symptoms and physical inactivity in technical-administrative workers at a public university in the state of Bahia, with the time worked and work position as the main associated factors. Such findings point to the imperative need to create organizational strategies to address issues related to psychological distress and physical-psychopathological manifestations.

Actions based on interventions that target workers' physical and mental health—such as adaptations in organizational management and the creation of effective programs to encourage physical activities in the workplace—could be critical in preventing and controlling risk factors for the occurrence of psychological distress among workers.

Further studies should be carried out to provide standardization of methods for assessing exposure to depressive symptoms and their repercussions on the employees' quality of life and work, with the aim of adopting effective individual and collective preventive measures and procedures.

References

1. World Health Organization. International Classification of Diseases [Internet]. 11 ed. Geneva: WHO; 2018 [cited mar 21, 2023]. Available from: https://icd.who.int/en

2. Kandola A, Ashdown-Franks G, Hendrikse J, Sabiston CM, Stubss B. Physical activity and depression: towards understanding the antidepressant mechanisms of physical activity. Neurosci Biobehav Rev. 2019;107:525-39.

3. Ferreira AP, Godinho MR, Oliveira BMC, Moura CCS, Paula CF, Martins NO, et al. The depressive symptomatology in workers of a public university: a cohort study of the associated factors. R Enferm UFJF. 2019;5(1):1-19.

4. World Health Organization. Depression and other common mental disorders: global health estimates [Internet]. Geneva: WHO; 2017 [cited mar 21, 2023]. Available from: https://apps.who.int/iris/bitstream/handle/10665/254610/WHO-MSD-MER-2017.2-eng.pdf

5. Instituto Brasileiro de Geografia e Estatística. Pesquisa Nacional de Saúde 2019: percepção do estado de saúde, estilos de vida, doenças crônicas e saúde bucal. Rio de Janeiro: IBGE; 2020.

6. Brasil. Tabelas – CID-10 [Internet]. Brasília, DF: Ministério do Trabalho e Previdência; 2022 [cited mar 21, 2023]. Available from: https://www.gov.br/previdencia/pt-br/assuntos/previdencia-social/saude-e-seguranca-do-trabalhador/acidente_trabalho_incapacidade/tabelas-cid-10

7. Seligmann-Silva E. Trabalhos e desgaste mental: o direito de ser dono de si mesmo. São Paulo: Cortez; 2011.

8. Bastos MLA, Silva GB Jr, Domingos ETC, Araújo RMO, Santos AL. Afastamentos do trabalho por transtornos mentais: um estudo de caso com servidores públicos em uma instituição de ensino no Ceará, Brasil. Rev Bras Med Trab. 2018;16(1):53-9.

9. Lopes SV, Silva MC. Estresse ocupacional e fatores associados em servidores públicos de uma universidade do sul do Brasil. Cienc Saude Colet. 2018;23(11):3869-80.

10. Loureiro T. O prazer-sofrimento de técnicos de laboratório em uma instituição federal de ensino superior do sudeste brasileiro: a (in)viabilidade da remoção. Rev PGPU. 2018;2(1):138-76.

11. Harvey SB, Overland S, Hatch SL, Wessely S, Mykletun A, Hotopf M. Exercise and the prevention of depression: results of the HUNT cohort study. Am J Psychiatry. 2018;175(1):28-36.

12. Souza F, Lins ICT, Silva DLA, Viana SEP, Silva FMA, Iser BPM. Níveis de atividade física e fatores associados entre professores de medicina. Cienc Saude (Porto Alegre). 2019;12(3):e33643.

13. Oliveira LA, Baldaçara LR, Maia MZB. Afastamento por transtornos mentais entre servidores públicos federais no Tocantins. Rev Bras Saude Ocup. 2015;40(132):156-69.

14. Fernandes EH. Qualidade de vida, estresse percebido, satisfação no trabalho e absenteísmo-doença de técnicos administrativos de uma universidade pública. [dissertação]. Canoas: Universidade La Salle; 2018.

15. Kandola A, Lewis G, Osbom DPJ, Stubbs B, Hayes JF. Depressive symptoms and objectively measured physical activity and sedentary behaviour throughout adolescence: a prospective cohort study. Lancet Psychiatry. 2020;7(3):262-71.

16. Méndez-Giménez A, Cecchini JA, Fernández-Río J, Carriedo A. Physical activity and prevention of depressive symptoms in the Spanish population during confinement due to Covid-19. Psicothema. 2021;33(1):111-7.

17. Godinho MR, Ferreira AP, Santos ASP, Rocha FSA. Fatores associados à qualidade do sono dos trabalhadores técnico-administrativos em educação de uma universidade pública. Rev Med Saude Brasilia. 2017;6(3):301-20.

18. Santos TS, Lopes SV, Caputo EL, Jerônimo JS, Silva MC. Atividade física e fatores associados em técnico-administrativos de uma universidade pública do sul do Brasil. Rev Bras Ativ Fis Saude. 2018;23:e0028.

19. Mendes AM, Ferreira MC, Cruz RM. Inventário sobre trabalho e riscos de adoecimento-Itra: instrumento auxiliar de diagnóstico de indicadores críticos no trabalho. In: Mendes AM, organizadores. Psicodinâmica do trabalho: teoria, método e pesquisas. São Paulo: Casa do Psicólogo; 2007. p. 111-26.

20. Kuorinka I, Jonsson B, Kilbom A, Vinterberg H, Biering-Sorensen F, Andersson G, et al. Standardised Nordic questionnaires for the analysis of musculoskeletal symptoms. Appl Ergon. 1987;18(3):233-7.

21. Barroso WKS, Rodrigues CIS, Bortolloto LA, Mota-Gomes MA, Brandão AA, Feitosa ADM, et al. Diretrizes Brasileiras de Hipertensão Arterial – 2020. Arq Bras Cardiol. 2021;116(3):516-658.

22. Sociedade Brasileira de Diabetes. Diretrizes da Sociedade Brasileira de Diabetes 2019-2020 [Internet]. São Paulo: SBD; 2019 [cited mar 4, 2023]. Available from: http://www.saude.ba.gov.br/wp-content/uploads/2020/02/Diretrizes-Sociedade-Brasileira-de-Diabetes-2019-2020.pdf

23. American Psychiatric Association (APA). Manual Diagnóstico e Estatístico de Transtornos Mentais – DSM-IV-TR. Porto Alegre: Artes Médicas, 2002.

24. Santos IS, Tavares BF, Munhoz TN, Almeida LSP, Silva NTB, Tams BD, et al. Sensitivity and specificity of the Patient Health Questionnaire-9 (PHQ-9) among adults from

the general population. Cad Saude Publica. 2013;29(8):1533-43.

25. Saunders JB, Aasland OG, Babor TF, de la Fuente JR, Grant M. Development of the Alcohol Use Disorders Identification Test (AUDIT): WHO Collaborative Project on Early Detection of Persons with Harmful Alcohol Consumption--II. Addiction. 1993 Jun;88(6):791-804.

26. Matsudo S, Araújo T, Matsudo V, Andrade D, Andrade E, Oliveira LC, et al. Questionário Internacional de Atividade Física (IPAQ): estudo de validade e reprodutibilidade no Brasil. Rev Bras Ativ Fis Saude. 2001;6(2):5-18.

27. Daniel WW. Biostatistics: a foundation for analysis in the health sciences. 6th ed. New York: Wiley; 1995.

28. Coutinho L, Scazufca M, Menezes P. Métodos para estimar razão de prevalência em estudos de corte transversal. Rev. Saude Publica. 2008;42(6):992-8.

29. Campelo GP. Condições de trabalho e saúde psíquica de servidores técnico-administrativos da UFRN [dissertação]. Natal: Universidade Federal do Rio Grande do Norte; 2015.

30. World Health Organization. WHO guidelines on physical activity and sedentary behaviour: at a glance. Geneva: WHO; 2020.

Acknowledgements

Contribution of the Authors

Beck Filho JA contributed to project conception and design, data collection and analysis, and preparation and review of the manuscript. Pitta AMF, Bonfim CB, Christovam BP, Machado AC, Guimarães LF and Hora T contributed to project design, data collection and analysis, and preparation and review of the manuscript. Brito LL and Maia HMSF contributed to project design, data collection and analysis, and preparation and review of the manuscript. The authors approved the final published version and assume full responsibility for the published content.

Data availability

The authors declare that the entire anonymized dataset supporting the results of this study is available from: https://figshare.com/articles/dataset/Association_between_depressive_symptoms_and_physical_inactivity_in_technical-administrative_workers_at_a_public_university_in_Northeastern_Brazil/21865209