JHGD
Journal of Human Growth and Development
www. jhgd.com.br

ORIGINAL ARTICLE

Prevalence and associated factors with back pain among public servants in the federal education system in Brazil

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Manuscript received: december 2025
Manuscript accepted: december 2025
Version of record online: march 2026

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Abstract

Backgroung: knowing and understanding aspects related to back pain can significantly improve the health and well-being of workers, reduce absenteeism, particularly among education public servants, and guide public policies.

Objective: to assess the overall prevalence of back pain and identify associated factors with it among public servants in the Federal Network of Professional, Scientific, and Technological Education (FNPSTE) in Brazil.

Methods: we conducted a cross-sectional study of 1,563 Brazilian public servants from all regions of Brazil. The data were collected in 2022. The independent variables included demographic, socioeconomic, behavioral, quality of life, and health data. The dependent variable was the occurrence of back pain in the past three months, as assessed using the BackPEI questionnaire. Poisson regression-adjusted multivariate analysis was performed.

Results: the overall prevalence of back pain was 79.4%, affecting 79.1% of teaching staff and 82.6% of education technical-administrative public servants. Back pain was more prevalent in women (84.9%) and individuals who remained seated for long periods at the computer (83.7% - more than 6 hours per day). Women experienced more pain four or more times a week ($p < 0.001$), and this pain limited their ability to perform activities ($p < 0.001$). Additionally, women experienced a higher prevalence of moderate pain than did men ($p < 0.001$). The presence of pain was associated with reading or studying in bed ($p = 0.002$) and with poor quality of life in both the physical ($p = 0.034$) and psychological ($p = 0.013$) domains.

Conclusion: the results indicate a high prevalence of back pain among FNPSTE public servants in Brazil, particularly in women, and an association between back pain, behavioral variables, and reduced quality of life.

Keywords: quality of life, occupational health, health personnel.

Suggested citation: Monteiro LF, Mendonça CR, Pereira NG, Oliveira IFR, Vitta A, Miñana-Signes V, Silva PRE, Noll M. Prevalence and associated factors with back pain among public servants in the federal education system in Brazil. *J Hum Growth Dev. 2026; 36(1):51-63.* DOI: http://doi.org/10.36311/jhgd.v36.17995

Authors summary

Why was this study done?
Back pain is a leading cause of disability worldwide, yet little is known about its prevalence and associated factors among public servants in Brazil's Federal Education System.

What did the researchers do and find?
We assessed 1,563 Brazilian federal education public servants and found that 79.4% reported back pain, with higher prevalence among women, and a significant association with prolonged computer use (over 6 hours/day) and the habit of reading or studying in bed.

What do these findings mean?
Ergonomic interventions, physical activity promotion, and postural education are urgently needed to reduce the high burden of back pain among federal education workers in Brazil, especially women.

INTRODUCTION

Back pain is a symptom that tends to be persistent and is one of the most common reasons individuals seek primary and emergency care visits[1]. Lower back pain, in particular, is considered a significant public health issue, as it is the leading cause of disability worldwide[2]. Moreover, it is associated with reduced productivity at work and represents a significant economic burden on individuals and society[3].

Complaints of work-related musculoskeletal disorders (WMSD), especially lower back pain, neck pain, and shoulder pain, are common among educational public servants[4–6] and non-academic educational workers in educational institutions[7,8]. Individual factors such as gender and age, along with ergonomic and occupational factors such as repetitive movements, static postures, inadequate and prolonged desk work, and extended periods of standing, have been associated with higher prevalence rates of this symptom[4,8,9]. Other factors include long working hours, a sedentary lifestyle, and excessive use of electronic devices[10].

Although studies have shown a high prevalence of back pain in educational workers[4,8], the impact of this pain has scarcely been addressed in the literature[11], particularly in terms of its association with behavioral, quality of life (QoL), and health variables. Therefore, the aim of this study was to evaluate the overall prevalence of back pain and the factors associated with it among public servants in the Federal Education System in Brazil.

METHODS

Design, population, and sample

This was a cross-sectional epidemiological study conducted between June and November 2022, and it is part of the "Quality of Life in Brazilian Education – QoLE-BRA" project[12,13]. The research population comprised all public servants from the teaching units of the Federal Network of Professional, Scientific, and Technological Education (FNPSTE) in Brazil, totaling 83,517 individuals[13].

The sample was composed of 1,563 Brazilian public servants from all regions of Brazil. For the sample calculation, a confidence level (CI) of 95% was used, a margin of error of ± 3%, an estimated proportion in the population of 50% and based on the finite population, the n was 1054. Predicting losses and refusals, the sample was increased by 50%.

All public servants, including teaching staff and educational technical-administrative public servants (ETAs) aged 18 years and older who were actively employed by the FNPSTE in Brazil in 2022, were included. Those who answered only part of the questionnaire were excluded.

Ethical aspects

This study was approved by the Research Ethics Committee (REC) of the Federal Institute of Goiás (approval number 5.270.596), CEP protocol number 52353621.3.0000.0036. The guidelines and norms established by Resolution No. 466 of December 2012 from the National Health Council, which regulates research involving human beings in Brazil, were adhered to. All participants signed the Informed Consent Form (ICF).

Data Collection

The sample selection was carried out randomly among FNPSTE staff, ensuring representativeness across different regions of the country. The data were collected using online questionnaires on the Google Forms digital platform. The questionnaires were structured and shared through this platform, and the links were sent to the participants' emails after they signed the ICF. The following instruments were included: (1) the WHOQOL-bref, consisting of 26 items to assess quality of life across four domains (physical, psychological, social relationships, and environment)[14]; (2) The DASS-21, which measures symptoms of depression, anxiety, and stress based on 21 items[15] and (3) The Back-PEI, used to assess back pain, time spent using a computer and television, and engagement in physical activity[16,17]. There was no prior training for the researchers responsible for data collection, as the process consisted solely of sending the online form.

Independent variables

The independent variables included sociodemographic, socioeconomic, behavioral, QoL, and health data. The demographic variables included gender, age group, marital status, region of Brazil (Midwest, Northeast, North, Southeast, and South), and type of housing environment (urban vs. rural). The socioeconomic variables included role in the FNPSTE, educational level, and length of service in the federal PTE (Professional and Technological Education - EPT in Portuguese) system.

Behavioral variables included questions about time spent sitting at the computer, hours per day spent watching television, hours of sleep per night, satisfaction with sleep, reading or studying in bed, preferred sleeping position, and practice of physical exercise or sports.

Dependent variable

The dependent variable was the prevalence of back pain over the past three months. Back pain was assessed using the Back Pain and Body Posture Evaluation Instrument (BackPEI) questionnaire[16,17].

Data analysis

The Statistical Package for the Social Sciences (SPSS, version 26) was used for the statistical analyses. The descriptive analyses are presented as absolute numbers (n) and relative frequencies (%), and the prevalence ratios (PR) were calculated along with their respective confidence intervals (CIs). The chi-squared test ($\chi 2$) was used for the bivariate analysis. Poisson regression was used to calculate the PRs and 95% CIs, while the p-value was obtained from the Wald test. Variables with a p-value < 0.20 in the bivariate analysis were included in the multivariable-adjusted Poisson regression analyses. Statistical significance was established using a cut-off value of $p < 0.05$.

RESULTS

The sample consisted of a total of 1,563 (±2.5%) individuals (42.7% men and 57.3% women), including 878 members of the ETAs and 685 members of the public servants. Table 1 presents information on the sociodemographic and socioeconomic characteristics of the public servants. The prevalence of back pain in the three months prior to the study was 79.4% (n=1,241). Thirty-two public servants were unsure whether they had experienced back pain (2%), and 18.6% (n=290) reported no back pain (Table 2).

Table 1: Prevalence of demographic and socioeconomic characteristics among FNPSTE public servants (N = 1,563)

Variables	n	%
Gender		
Women	895	57.30%
Men	668	42.70%
Age group (years)		
≤ 33	181	11.60%
33-37	374	23.90%
38-42	356	22.8%
43-47	250	16.00%
48-52	163	10.40%
≥ 53	239	15.30%
Educational attainment		
High school, college degree, and/or professional training	111	7.00%
Specialization and/or MBA	484	31.00%
Masters	636	40.70%
PhD and/or post-doctorate	332	21.30%
Region		
North and Northeast	411	26.30%
Midwest	504	32.20%
South	242	15.50%
Southeast	406	26.00%
Marital status		
Single	369	24.10%
Married/widowed	1.012	66.10%
Divorced	150	9.80%
Position		
Education Technical-Administrative Staff	878	56.20%
Teaching Staff	685	43.80%

Note: The percentage values (%) have been rounded to one decimal place.

The analysis of the prevalence of back pain among FNPSTE public servants by gender is presented in Table 2. The results indicated that women had a higher prevalence of back pain in the last 3 months than did men ($p < 0.001$). Women experienced pain four or more times a week ($p < 0.001$), and this pain limited their activities ($p < 0.001$). There was also a difference in pain intensity, indicating that women had a higher prevalence of moderate and severe pain than did men, while men had a higher prevalence of mild pain than did women ($p < 0.001$) (Table 2).

The chi-squared test (χ 2) was used to calculate all p-values. A p-value of less than 0.05 was considered statistically significant (bold). Pain intensity was classified according to the criteria of Boonstra, *et al.* (2016), which categorizes pain as no pain (score = 0), mild pain (score ≤ 5), moderate pain (scores 6 and 7), and severe pain (score ≥ 8)[18].

The bivariate analysis indicated that back pain was associated with women, time sitting using the computer (more than 6 hours a day), dissatisfaction with sleep, reading or studying in bed, lack of regular physical exercise or sports, lower QoL in the physical, social, environmental and psychological domains as assessed by the WHOQOL-bref, and the highest tertile of depression, anxiety, and stress as assessed by the DASS-21 questionnaire (Table 3)

Table 2: Prevalence of back pain among FNPSTE public servants by gender (N = 1,563)

Variables	Total n (%)	Women n (%)	Men n (%)	p-value
Have you had any back pain in the last 3 months?				**< 0.001**
No	290 (18.55%)	133 (14.86%)	157 (23.50%)	
Yes	1241 (79.40%)	747 (83.46%)	494 (73.95%)	
Did not know how to answer	32 (2.00%)	15 (1.68%)	11 (2.54%)	
If you have experienced back pain in the last 3 months, how frequently has it occurred?				**< 0.001**
It was only once	101 (8.14%)	51 (6.83%)	50 (10.12%)	
Once a month	193 (15.55 %)	95 (12.72%)	98 (19.84%)	
Once a week	231 (15.55 %)	137 (18.34%)	94 (19.03%)	
Two to three times a week	250 (20.15%)	163 (21.82%)	87 (17.61%)	
Four or more times a week	298 (24.01%)	199 (26.64%)	99 (20.04%)	
Did not know how to answer	168 (13.54 %)	102 (13.65%)	66 (13.36%)	
If you have experienced back pain in the last three months, has it limited your activities?				**< 0.001**
Yes	268 (21.60%)	160 (21.42%)	108 (21.86%)	
No	931 (75.02%)	559 (74.83%)	372 (75.30%)	
Did not know how to answer	42 (3.38%)	28 (3.75%)	14 (2.83%)	
*If you have experienced back pain in the past three months, how would you rate the intensity of that pain on a scale from 1 to 10?				**< 0.001**
≤5	772 (62.21%)	438 (58.63%)	334 (67.61%)	
6 to 7	296 (23.85%)	192 (25.70%)	104 (21.05%)	
8 to 10 months	173 (13.94%)	117 (15.66%)	56 (11.34%)	

The chi-squared test (χ 2) was used to calculate all p-values. A p-value of less than 0.05 was considered statistically significant (bold). Pain intensity was classified according to the criteria of Boonstra, et al. (2016), which categorizes pain as no pain (score = 0), mild pain (score ≤ 5), moderate pain (scores 6 and 7), and severe pain (score ≥ 8) [18].

Table 3: Prevalence and bivariate analysis of the association between back pain and sociodemographic, socioeconomic, behavioral, quality of life, and health variables among FNPSTE public servants (n = 1531)

Variables	Prevalence % (n)	Prevalence % (n)	Pain PR (95% CI)	p-value
Demographic				
Gender				**<0.001**
Men	651 (42.50%)	494 (75.90%)	1	
Women	880 (57.50%)	747 (84.90%)	1.12 (1.06-1.18)	
Age group (years)				0.105
22 to 32	175 (11.40%)	142 (81.10%)	1.06 (0.96-1.17)	

Table 3: Prevalence and bivariate analysis of the association between back pain and sociodemographic, socioeconomic, behavioral, quality of life, and health variables among FNPSTE public servants (N = 1531).

Variables	Prevalence % (n)	Prevalence % (n)	Pain PR (95% CI)	p-value
33 to 37	364 (23.80%)	310 (85.20%)	1.11 (1.02-1.21)	
38 to 42	352 (23.00%)	290 (82.40%)	1.08 (0.00-1.17)	
43 to 47	246 (16.10%)	192 (78.00%)	1.02 (0.92-1.12)	
48 to 52	159 (10.40%)	127 (79.90%)	1.04 (0.94-1.16)	
≥53 years	235 (15.30%)	180 (76.60%)	1	
Marital status				0.422
Married/widowed	1.012 (66.10%)	830 (82.00%)	1	
Single	369 (24.10%)	294 (79.40%)	0.968 (0.91-0.03)	
Divorced	150 (9.80%)	118 (78.70%)	0.959 (0.88-1.05)	
Region				0.175
Midwest	490 (32.00%)	399 (81.40%)	1	
Northeast	332 (21.70%)	278 (83.70%)	1.03 (0.97-1.10)	
North	71 (4.60%)	61 (85.90%)	1.06 (0.95-1.17)	
Southeast	403 (26.30%)	315 (78.20%)	0.96 (0.90-1.03)	
South	235 (15.30%)	188 (80.00%)	0.98 (0.91-1.06)	
Housing environment				0.859
Urban Environment	1.455 (95.00%)	1.180 (81.10%)	1	
Rural environment	76 (5.00%)	61 (80.20%)	0.99 (0.93-1.07)	
Socioeconomic				
Role				0.093
Teaching Staff	676 (44.20%)	535 (79.10%)	1	
ETA	855 (55.80%)	706 (82.60%)	1.04 (0.99-1.10)	
Educational attainment				0.999
High school, college degree, and professional training	109 (7.10%)	89 (81.70%)	1	
Specialization/MBA	471 (30.80%)	382 (81.10%)	1.00 (0.92-1.08)	
Masters	625 (40.80%)	506 (81.00%)	0.99 (0.92-1.08)	
PhD and postdoctoral studies	326 (21.30%)	264 (81.00%)	0.99 (0.91-1.08)	
Length of service in the Federal PTE System				0.618
Up to 10 years	965 (63.00%)	785 (81.30%)	1.08 (0.82-1.44)	
11 to 20 years	469 (30.60%)	383 (81.70%)	1.09 (0.82-1.45)	
21 to 30 years old	81 (5.30%)	61 (75.30%)	1.00 (0.74-1.37)	
31 or more	16 (1.00%)	12 (75.00%)	1	
Behavioral				
Hours a day spent sitting using the computer				<0.001
≤4 hours a day	308 (20.10%)	236 (76.10%)	1	
5 to 6 hours a day	413 (27.0%)	323 (78.20%)	1.02 (0.94-1.11)	
More than 6 hours a day	762 (49.80%)	638 (83.70%)	1.09 (1.02-1.17)	
I do not know how to answer, it depends on the day	48 (3.10%)	44 (91.70%)	1.20 (1.08-1.33)	

Table 3: Prevalence and bivariate analysis of the association between back pain and sociodemographic, socioeconomic, behavioral, quality of life, and health variables among FNPSTE public servants (N = 1531)

Variables	Prevalence % (n)	Prevalence % (n)	Pain PR (95% CI)	p-value
Hours spent each day watching television				0.962
<1 h a day	528 (34.50%)	430 (81.40%)	1	
1 hour or more per day	925 (60.40%)	748 (80.90%)	0.99 (0.94-1.04)	
Do not know how to answer, it depends on the day	78 (5.10%)	63 (80.80%)	0.99 (0.88-1.11)	
How many hours do you sleep a night?				0.973
0 to 5 hours a day	239 (15.60%)	197 (82.40%)	1.01 (0.88-1.15)	
6 hours a day	429 (28.00%)	345 (80.40%)	0.98 (0.86-1.11)	
7 hours a day	503 (32.90%)	406 (80.70%)	0.98 (0.87-1.12)	
8 hours a day	299 (19.50%)	243 (81.30%)	0.99 (0.87-1.13)	
≥9 hours per day	61 (4.00%)	50 (82.00%)	1	
How would you rate your sleep?				**<0.001**
Very dissatisfied or dissatisfied	412 (26.90%)	362 (87.90%)	1.31 (1.19-1.45)	
Neither satisfied nor dissatisfied	392 (25.60%)	338 (86.20%)	1.29 (1.17-1.42)	
Satisfied	486 (31.70%)	380 (78.20%)	1.17 (1.06-1.29)	
Very satisfied	241 (15.70%)	161 (66.80%)	1	
How satisfied are you with the quality of your sleep?				**<0.001**
Very dissatisfied or dissatisfied	425 (27.80%)	371 (87.30%)	1.29 (1.17-1.42)	
Neither satisfied nor dissatisfied	420 (27.40%)	364 (86.70%)	1.28 (1.16-1.41)	
Satisfied	463 (30.20%)	355 (76.70%)	1.13 (1.02-1.26)	
Very satisfied	223 (14.60%)	151 (67.70%)	1	
Do you often read or study in bed?				**<0.001**
No	675 (44.10%)	507 (75.10%)	1	
Sometimes	418 (27.30%)	359 (85.90%)	1.14 (1.08-1.21)	
Yes	438 (28.60%)	375 (85.60%)	1.13 (1.07-1.20)	
What is your preferred sleeping position?				0.212
On my back	104 (6.80%)	79 (76.00%)	1	
Sideways	999 (65.30%)	816 (81.70%)	1.08 (0.96-1.20)	
Prone	341 (22.30%)	282 (82.70%)	1.09 (0.97-1.23)	
I do not know; it depends on the day	87 (5.70%)	64 (73.60%)	0.97 (0.82-1.14)	
Do you practice any physical exercise or sport on a regular basis?				**<0.001**
Yes	850 (55.50%)	662 (77.90%)	1	
No	681 (44.00%)	579 (85.00%)	1.09 (1.04-1.14)	

Table 3: Prevalence and bivariate analysis of the association between back pain and sociodemographic, socioeconomic, behavioral, quality of life, and health variables among FNPSTE public servants (N = 1531)

Variables	Prevalence % (n)	Prevalence % (n)	Pain PR (95% CI)	p-value
How many days do you practice this exercise/sport per week?				
			0.805	
I do not know how to answer, it depends	19 (2.20%)	15 (78.90%)	0.97 (0.76-1.23)	
1 to 2 days a week	191 (22.40%)	149 (78.00%)	0.95 (0.87-1.05)	
3 to 4 days a week	412 (48.40%)	334 (81.10%)	0.99 (0.92-1.07)	
5 or more days a week	229 (26.90%)	187 (81.70%)	1	
Quality of Life (WHOQOL-bref)				
Physical Domain				**<0.001**
First tertile (lowest QoL)	550 (35.90%)	495 (90.00%)	1.30 (1.21-1.39)	
Second tertile	529 (34.60%)	432 (81.70%)	1.18 (1.09-1.26)	
Third tertile (higher QoL)	452 (29.50%)	314 (69.50%)	1	
Social Domain				**<0.001**
First tertile (lowest QoL)	537 (35.10%)	463 (86.20%)	1.19 (1.10- 1.29)	
Second tertile	715 (46.70%)	576 (80.60%)	1.11 (1.03-1.21)	
Third tertile (higher QoL)	279 (18.20%)	202 (72.40%)	1	
Environmental Domain				**<0.001**
First tertile (lowest QoL)	514 (33.60%)	451 (87.70%)	1.20 (1.12-1.28)	
Second tertile	585 (38.20%)	473 (80.90%)	1.10 (1.03-1.18)	
Third tertile (higher QoL)	432 (28.20%)	317 (73.40%)	1	
Psychological Domain				**<0.001**
First tertile (lowest QoL)	459 (30.00%)	400 (87.10%)	1.20 (1.13-1.28)	
Second tertile	434 (28.30%)	379 (87.30%)	1.21 (1.14-1.28)	
Third tertile (higher QoL)	638 (41.70%)	462 (72.40%)	1	
Total				**<0.001**
First tertile (lowest QoL)	505 (33.00%)	446 (88.30%)	1.23 (1.16-1.31)	
Second tertile	511 (33.40%)	426 (83.40%)	1.16 (1.09-1.24)	
Third tertile (higher QoL)	515 (33.60%)	369 (71.70%)	1	
Health				
DASS 21				
Depression				**<0.001**
First tertile (lowest DEP)	563 (36.80%)	411 (73.00%)	1	
Second tertile	530 (34.6%)	436 (82.30%)	1.13 (1.06-1.20)	
Third tertile (highest DEP))	438 (28.6%)	394 (90.00%)	1.23 (1.16-1.31)	
Anxiety				**<0.001**
First tertile (lowest anxiety)	562 (36.70%)	400 (71.20%)	1	
Second tertile	487 (31.80%)	407 (83.60%)	1.17 (1.10-1.25)	
Third tertile (largest anxiety)	482 (31.50%)	434 (90.00%)	1.26 (1.19-1.34)	
Stress				**<0.001**
First tertile (lowest stress)	569 (37.20%)	402 (70.70%)	1	
Second tertile	477 (31.20%)	400 (83.90%)	1.19 (1.11-1.27)	
Third tertile (highest stress)	485 (31.70%)	439 (90.50%)	1.28 (1.21-1.36)	

CI: confidence interval; ETA: Education Technical-Administrative Staff; QoL: quality of life; PR: adjusted prevalence ratio. The chi-squared test (χ^2) was used to calculate all p-values. A p-value < 0.05 was considered statistically significant (bold).

Table 4: Multiple analysis of the association between pain and independent variables in FNPSTE public servants (N=1,563).

Variables	PR (95% CI)	p-values
Demographic		
Gender		**0.018**
Men	1	
Women	1.06 (1.01-1.09)	
Age group (years)		0.479
22 to 32	0.99 (0.92-1.07)	
33 to 37	1.03 (0.96-1.10)	
38 to 42	1.00 (0.93-1.07)	
43 to 47	0.97 (0.90-1.04)	
48 to 52	0.99 (0.92-1.07)	
≥53	1	
Region		0.521
Midwest	1	
Northeast	1.01 (0.96-1.06)	
North	1.02 (0.94-1.11)	
Southeast	0.96 (0.92-1.01)	
South	0.99 (0.94-1.05)	
Hours a day spent sitting using the computer		0.081
≤4 hours a day	1	
5 to 6 hours a day	0.99 (0.94-1.05)	
More than 6 hours a day	1.03 (0.97-1.08)	
I do not know how to answer, it depends on the day	1.11 (1.01-1.21)	
How would you rate your sleep?		0.358
Very dissatisfied or dissatisfied	1.11 (0.99-1.24)	
Neither satisfied nor dissatisfied	1.09 (0.98-1.22)	
Satisfied	1.08 (0.98-1.19)	
Very satisfied	1	
How satisfied are you with the quality of your sleep?		0.554
Very dissatisfied or dissatisfied	0.97 (0.85-1.09)	
Neither satisfied nor dissatisfied	1.01 (0.90-1.13)	
Satisfied	0.99 (0.89-1.09)	
Very satisfied	1	
Do you often read or study in bed?		**0.003**
No	1	
Sometimes	1.08 (1.03-1.13)	
Yes	1.07 (1.02-1.12)	
Do you practice any physical exercise or sport on a regular basis?		0.116
Yes	1	
No	1.03 (0.99-1.07)	
Quality of Life (WHOQOL-bref)		
Physical Domain		**0.030**
First tertile (low)	1.10 (1.02-1.19)	
Second tertile	1.04 (0.98-1.11)	

Table 4: Multiple analysis of the association between pain and independent variables in FNPSTE public servants (N=1,563).

Variables	PR (95% CI)	p-values
Third tertile (high)	1	
Social Domain		0.482
First tertile (low)	1.04 (0.96- 1.13)	
Second tertile	1.02 (0.95-1.08)	
Third tertile (high)	1	
Environmental Domain		0.194
First tertile (low)	1.06 (0.99-1.15)	
Second tertile	1.02 (0.96-1.08)	
Third tertile (high)	1	
Psychological Domain		**0.015**
First tertile (low)	1.02 (0.95-1.10)	
Second tertile	1.07 (1.01-1.14)	
Third tertile (high)	1	
Total		0.166
First tertile (low)	0.89 (0.79-1.00)	
Second tertile	0.94 (0.87-1.02)	
Third tertile (high)	1	
Health		
DASS 21		
Depression		0.878
First tertile (low)	1	
Second tertile	1.00 (0.94-1.06)	
Third tertile (high)	1.01 (0.94-1.08)	
Anxiety		0.088
First tertile (low)	1	
Second tertile	1.06 (1.01-1.12)	
Third tertile (high)	1.06 (0.99-1.13)	
Stress		0.064
First tertile (low)	1	
Second tertile	1.06 (0.99-1.12)	
Third tertile (high)	1.09 (1.01-1.17)	

CI: confidence interval; PR: prevalence ratio. The Wald test was used to calculate all p-values. A p-values < 0.05 were considered statistically significant (bold).

After the multivariate analysis, the presence of pain was also associated with women (p = 0.018), reading or studying in bed (p = 0.002), and low QoL in the physical (p = 0.030) and psychological (p = 0.015) domains (Table 4).

DISCUSSION

This study assessed the prevalence of back pain among public servants of the FNPSTE in Brazil and its association with sociodemographic, socioeconomic, behavioral, QoL, and health data. As contributions of this study, we highlight the high prevalence of back pain over the last three months among public servants in the Federal Education System, affecting 79.1% of teaching staff and 82.6% of ETAs. Moreover, back pain was associated with women, the habit of reading or studying in bed, and low QoL in the physical and psychological domains.

The high prevalence of back pain has also been reported in other studies involving teachers from public elementary schools in Brazil[5,6]. Studies indicate that pain complaints worsened due to lifestyle changes and the interruption of in-person educational activities during the pandemic[5,7]. Other studies have also reported a high prevalence of back pain among primary, secondary, and tertiary school teachers in countries such as the United Arab Emirates[8], the Eastern Province of the Kingdom

of Saudi Arabia[18], Tunisia[19], Egypt[20], the Philippines[21], Spain[22], and Slovakia[23], as well as among non-academic staff in educational institutions[7,8].

In Brazil, a study conducted on 15,641 teachers reported a significant worsening of back pain. The pain was associated with psychological conditions, sociodemographic characteristics, and lifestyle[5]. Another study conducted in Brazil revealed that about 58% of teachers reported experiencing back pain due to changes in their routine activities during the pandemic[6]. Back pain can also be attributed to the frequent use of technology[24,25].

In a study conducted in the United Arab Emirates, 71.4% of teachers experienced WMSD, with neck pain being the most common at 74.3%26. In the eastern province of the Kingdom of Saudi Arabia, 62.56% of teachers reported experiencing lower back pain[18]. In Tunisia, the prevalence of lower back pain among teaching staff was 71.8%[19]. In Egypt, 56.1% of teachers reported neck pain, 53.2% reported shoulder pain, 53.2% reported lower back pain, and 50.6% reported knee pain[20]. In the Philippines, the prevalence of musculoskeletal pain among teachers was 74.5%, leg pain 56.5%, and lower back pain 56%[21]. Finally, in Spain, the lifetime prevalence of lower back pain among teachers was 96.5%[22].

On the other hand, the prevalence of WMSD among non-academic staff at educational institutions was 71.9%[7]. The lower back, wrists or hands, and shoulders were the body regions most commonly reported for these disorders[7]. Another study also reported a high prevalence of WMSD after 3 months in the lumbar region (n = 72, 72%) and wrists or hands (n = 60, 60%)[26].

In the present study, women reported back pain more frequently than men. This finding is also consistent with the literature[5–7,18,20]. The higher prevalence of back pain among women in all age groups can be explained based on psychological factors, hormonal and reproductive factors, and body composition related to women[27]. An observational study conducted in Germany concluded that, although women generally lead healthier lifestyles than men, they experience a higher prevalence of back pain, primarily due to gender bias and insufficient social support[28].

Among teachers and ETAs, the behavioral factor most associated with back pain was the number of hours spent sitting at a computer each day. This finding aligns with other studies[6,23]. One of them revealed that the highest prevalence of back pain was among teachers who used a computer or tablet for 6 hours or more[6]. Moreover, another study reported that the intensity of back pain among female teachers in Slovakia was significantly higher in those who remained seated all or most of the time than in those who moved all or most of the time ($p < 0.001$; ES = 1.87)[23]. Furthermore, the current study found an association between back pain and/or reading or studying in bed. We did not find another study that reported this type of association among teachers and non-academic staff at educational institutions.

Our data indicate that back pain among survey participants was associated with poorer QoL in both physical and psychological domains. Other studies have also shown that back pain is associated with poor QoL, negative changes in health status and mood, frequent feelings of anxiety, depression, or stress[5,6,20].

The present study was conducted during the period marking the end of the public health emergency caused by the COVID-19 pandemic in Brazil[29], so it is important to note that the social distancing measures implemented during the pandemic had adverse psychological effects, including increased anxiety, depression, and stress[29–33]. During the social isolation imposed by the COVID-19 pandemic, education professionals had to rapidly adapt to remote teaching, resulting in increased screen time and a significant rise in back pain[34,35]. Barbosa *et al.*, 2021 evaluated state-level public servants in the Brazilian state of Minas Gerais, including more than 15,000 teachers, and approximately 58% of participants reported low back pain caused by routine changes during the pandemic[35]. Additionally, it is known that there is a correlation between musculoskeletal pain and the presence and severity of symptoms of depression and anxiety, as they share the same pathophysiological pathways[20,36].

The strength of this study was the recruitment of public servants from Brazil's Federal Education System and the large sample size compared to other studies involving teaching staff[18,20,26] and non-teaching staff of educational institutions[7,8]. The current study also had some limitations. First, because this is a cross-sectional design, the study allows for the identification of prevalence and associations between the risk factors assessed and the occurrence of pain, but it does not allow causal inferences. Second, information and memory biases may have occurred due to the self-reporting of the investigated variables. Additionally, the data collected were not based on an objective expert clinical diagnosis or an ergonomic analysis of the workplace, which may lead to the underestimation or overestimation of results.

CONCLUSION

This study presents evidence of a high prevalence of back pain among the public servants at the FNPSTE in Brazil. The highest prevalence of back pain was observed in women, and the presence of pain was associated with behavioral variables, such as reading or studying in bed, the number of hours spent sitting at a computer per day, and low QoL, primarily affecting the physical and psychological domains. Thus, ergonomic approaches in the workplace, promotion of physical activity, and education on proper posture can be implemented to prevent and reduce the occurrence of back pain among educational public servants.

Acknowledgments

We thank the IF Goiano, GPSaCA, UFG, FAPEG and CNPq for the support.

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Resumo

Introdução: conhecer e compreender aspectos relacionados à dor nas costas pode melhorar significativamente a saúde e o bem-estar dos trabalhadores, reduzir o absenteísmo, especialmente entre servidores públicos da educação, e orientar políticas públicas.

Objetivo: avaliar a prevalência geral de dor nas costas e identificar fatores associados entre servidores públicos da Rede Federal de Educação Profissional, Científica e Tecnológica (FNPSTE) do Brasil.

Método: foi realizado um estudo transversal com 1.563 servidores públicos brasileiros de todas as regiões do Brasil. Os dados foram coletados em 2022. As variáveis independentes incluíram dados demográficos, socioeconômicos, comportamentais, de qualidade de vida e saúde. A variável dependente foi a ocorrência de dor nas costas nos três meses anteriores, avaliada por meio do questionário BackPEI. Realizou-se análise multivariada ajustada por regressão de Poisson.

Resultados: a prevalência geral de dor nas costas foi de 79,4%, afetando 79,1% dos docentes e 82,6% dos servidores técnico-administrativos em educação. A dor nas costas foi mais prevalente entre mulheres (84,9%) e indivíduos que permaneciam sentados por longos períodos ao computador (83,7% – mais de 6 horas por dia). As mulheres relataram mais episódios de dor quatro ou mais vezes por semana ($p < 0,001$), e essa dor limitou sua capacidade de realizar atividades ($p < 0,001$). Além disso, as mulheres apresentaram maior prevalência de dor moderada em comparação aos homens ($p < 0,001$). A presença de dor esteve associada ao hábito de ler ou estudar na cama ($p = 0,002$) e à baixa qualidade de vida tanto no domínio físico ($p = 0,034$) quanto no psicológico ($p = 0,013$).

Conclusão: os resultados indicam alta prevalência de dor nas costas entre os servidores da FNPSTE no Brasil, especialmente em mulheres, e associação entre dor nas costas, variáveis comportamentais e redução da qualidade de vida.

Palavras-chave: qualidade de vida, saúde ocupacional, profissionais de saúde.