

# Factors associated with work activity of technical-administrative staff from state universities retired due to disability

*Fatores associados à atividade laboral de técnico-administrativos de universidades estaduais aposentados por invalidez*

*Factores asociados a la actividad laboral de técnicos-administrativos de universidades estatales jubilados por invalidez*

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## ABSTRACT

**Objective:** To verify the factors associated with the type of work activity performed by university technical-administrative staff retired due to disability.

**Method:** Cross-sectional research with 68 workers, conducted using an electronic questionnaire between November 2019 and September 2020. Data were collected on sociodemographic, occupational characterization and causes of disability. Data were analyzed descriptively and by multiple logistic regressions.

**Results:** Health professionals were more likely to have mental and behavioral disorders, associated with females and regardless of age. The chances of the nervous system diseases were higher in workers who performed administrative work, being associated with higher education. Operational employees were more likely to have musculoskeletal diseases associated with primary and secondary education and were male, regardless of age.

**Conclusion:** There was an association between work activity performed before retirement and the diseases responsible for disability, with differences between gender, age, and educational levels.

**Descriptors:** Retirement. Insurance, disability. Government employees. Universities. Mental disorders.

## RESUMO

**Objetivo:** Verificar os fatores associados ao tipo de atividade laboral exercida por trabalhadores técnico-administrativos universitários aposentados por invalidez.

**Método:** Pesquisa transversal com 68 trabalhadores, realizada por meio de questionário eletrônico entre novembro de 2019 e setembro de 2020. Foram coletados dados sobre a caracterização sociodemográfica, ocupacional e causas da invalidez. Os dados foram analisados descritivamente e por regressões logísticas múltiplas.

**Resultados:** Os profissionais da saúde tiveram mais chances de apresentarem os transtornos mentais e comportamentais, associados ao sexo feminino e independentemente da idade. As chances de doenças do sistema nervoso foram maiores em trabalhadores que exerceram trabalho administrativo, sendo associadas ao ensino superior. Servidores operacionais apresentaram maiores chances de doenças osteomusculares associadas ao ensino fundamental e médio e ao sexo masculino, independentemente da idade.

**Conclusão:** Houve associação da atividade laboral exercida anteriormente à aposentadoria com as doenças responsáveis pela invalidez, com diferenças entre sexo, idade e níveis educacionais.

**Descritores:** Aposentadoria. Seguro por invalidez. Empregados do governo. Universidades. Transtornos mentais.

## RESUMEN

**Objetivo:** Verificar los factores asociados al tipo de trabajo desempeñado por trabajadores universitarios técnico-administrativos jubilados por invalidez.

**Método:** Estudio transversal con 68 trabajadores, realizada mediante cuestionario electrónico entre noviembre de 2019 y septiembre de 2020. Se recolectaron datos sociodemográficos, ocupacionales y causas de discapacidad. Los datos se analizaron de forma descriptiva y mediante regresiones logísticas múltiples.

**Resultados:** Los profesionales de la salud tenían mayor probabilidad de presentar trastornos mentales y del comportamiento, asociados al sexo femenino e independientemente de la edad. Las posibilidades de enfermedades del sistema nervioso fueron mayores en los trabajadores que realizaban labores administrativas. Los servidores operativos tenían más probabilidades de tener enfermedades musculoesqueléticas asociadas a la educación primaria y secundaria y eran del sexo masculino, independientemente de la edad.

**Conclusión:** Hubo asociación entre el trabajo realizado antes de la jubilación y las enfermedades responsables de la invalidez, con diferencias entre sexo, edad y nivel educativo.

**Descritores:** Jubilación. Seguro por discapacidad. Empleados de gobierno. Universidades. Trastornos mentales.

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## INTRODUCTION

Work occupies a place in people's lives and has different meanings for them. In this study, work is understood conceptually as something that has a connotation of centrality in people's lives, as an essential condition, not only for financial maintenance, but for the dignification of life, that is, working constitutes a relevant vital part. Labor is understood from three perspectives: the objective, in which human beings need to work to determine their living conditions; the social, in which labor acquires connotations in the social context inserted; and, finally, the subjective, which relates to the subjective gain or loss that people have with work<sup>(1)</sup>.

Therefore, leaving the world of work causes unique transformations for people and, when this exit takes place through disability retirement, the repercussions occur both in the workforce and in the individual's own life<sup>(2)</sup>.

Disability retirement results from the total and permanent incapacity of the worker to conduct the position, function and job or when the performance of his activities leads to risks to the life of the individual or third parties, as well as leads to the worsening of his disease<sup>(3)</sup>.

Retirement due to disability, in addition to indicating a significant degree of labor incapacity, implies negative emotions, feelings of worthlessness and high financial costs for the treatment of the disease or accident that motivated it<sup>(4)</sup>.

It is noteworthy that the different professional categories are inserted in work environments that often favor the development of physical and mental illnesses, that is, the working conditions contribute to unfavorable outcomes for the worker's health, which can bring harm to people's biopsychosocial health<sup>(5)</sup>. In this perspective, work when harmful to health, can lead people to retire due to disability.

Among the workers who retire due to disability are public employees. This is a vulnerable group, which suffers political and public pressure, and which often develops work in precarious conditions, with insufficient infrastructure and staff and without appropriate working conditions<sup>(6)</sup>.

As for the public service, it is possible to list determinants for the worker's illness contributed with the work environment that has been transformed with globalization, with the increasing workload, with the labor and social security reforms. Work in public organizations is characterized by bureaucracy, fragmentation, precariousness, moral harassment and progressive loss of rights<sup>(7)</sup>.

Regarding work specifically in public universities, it is divided into two careers, technical-administrative and teaching. The technical-administrative staff perform activities in different university departments and are in direct contact

with the academic community and, depending on the position, with the population. Particularly, in the State of Paraná, they are defined as university agents, a term appropriate to the different levels of the career composed of professionals with higher education, high school level and operational level<sup>(8)</sup>. However, this study adopted the name used by most universities, which is technical-administrative workers.

In view of the above and due to the lack of studies on disability retirement, research on this topic becomes relevant, as it will enable managers to formulate public policies, as well as to develop actions that seek to promote health, reduce the aggravations and, prevent disability retirements, improving the quality of life (QoL) of workers<sup>(2)</sup>.

Therefore, the research question is: What factors are associated with the work activity performed prior to retirement due to disability among workers of public universities? To answer this question, the objective was to verify the factors associated with the type of work activity performed by retired technical-administrative staff from university institutions due to disability.

## METHOD

This is a cross-sectional study, described according to the guideline for observational studies Strengthening the Reporting of Observational Studies in Epidemiology (STROBE).

The State of Paraná has seven state universities with campuses located in 32 cities in different regions of the state, offering undergraduate and graduate courses. All universities develop teaching, research and extension activities and four of them have a university hospital. The university community is made up of students and public employees, the latter divided into technical-administrative and teaching staff.

The population consisted of technical-administrative staff retired due to disability between 2007 and 2017, from public state universities in Paraná (PR), Brazil. Regarding the selected period, the initial year refers to the establishment of one of the seven universities under study and the final year coincides with the last granted disability retirement in the research locations.

Technical-administrative worker retired due to disability who had a statutory legal regime at one of the universities before retirement and who were able to answer the questionnaires in writing or verbally were included. Professors were excluded, even those retired due to disability.

The Deans of Human Resources of the universities informed a total of 163 technical-administrative staff members who were retired due to disability, with their respective contacts. However, there were missing or outdated data, requiring

searches on social media, telephone directories, association, and union websites to gather information contact.

The retirees were invited to participate in the study by telephone, electronic media, and the research was also published on the website of one of the universities, with a link to access the questionnaire. There were 10 attempts to contact retirees, using more than one resource for recruitment.

The convenience sample consisted of 68 retired technical-administrative staff members who agreed to participate in the research, corresponding to 41.7% of the study population (6.9% could not be located, 23.3% had died and 28, 1% refused to participate). The distribution of the population and sample according to the university is described in Chart 1, in which it is possible to verify that two universities did not have retirees included in the research, one because there were no technical-administrative retirees in the period and the other because the only retiree due to disability had died.

Participants chose to answer the questionnaire electronically or by telephone. Data collection took place from November 2019 to September 2020, the period necessary for locating potential participants, and the in-person search comprised the last resource for locating potential participants, given that after March 2020 there was a pandemic caused by the new coronavirus (SARS-CoV-2) and the COVID-19 disease.

The questionnaire used for data collection was prepared by the first author, having been pilot tested and used in previous research with retirees due to disability from a public university in 2016<sup>(9)</sup>. The questionnaire had the following variables: age, gender, marital status, education level, income, function, weekly workload, time working at the university, time since retirement and causes of permanent disability, all self-reported responses. The causes of disability retirement informed by the participants were later categorized according to the tenth version of the International Statistical Classification of Diseases and Related Health Problems (ICD-10)<sup>(10)</sup>.

For analysis, demographic and occupational variables were dichotomized, except for the function variable, categorized according to the work activities carried out: health professional (nursing assistant and technician, nurse, physical therapist and laboratory technician); administrative (administrative assistant and technician, office assistant, copier operator, file and secretary); and operational (kitchen and nutrition assistant, cleaning assistant, cook, laundry worker, maintenance staff, doorman, general services, security and janitor).

Data were analyzed using the Statistical Package for Social Science (SPSS), version 20.0. In the descriptive analysis, the variables were presented in absolute and relative frequencies.

In the inferential, univariate analyzes were performed, according to the work activity performed before retirement.

Next, multiple logistic regressions were performed using the stepwise forward bootstrap method, individually inserting all independent variables that presented  $p < 0.20$ , remaining only those that had statistical significance ( $p < 0.05$ ) or that adjusted the other variables by at least 10%. The adjustment of the model and its explained variation were verified using the Hosmer-Lemeshow and Nagelkerke R Square tests, respectively<sup>(11)</sup>. The results were presented in odds ratio and 95% confidence intervals, that is,  $p < 0.05$  was considered statistically significant according to Wald chi-square test.

The development of the study complied with national and international research ethics standards, including approval by the Research Ethics Committee on February 11, 2019, according to Opinion no.3,142,018. The participants answered the questionnaire after agreeing to the Free and Informed Consent Form (FICF) available electronically or read, in the case of telephone call.

## ■ RESULTS

In this study, 68 technical-administrative staff members retired due to disability participated, with a mean age of 60 ( $\pm 9.44$ ) years. The sociodemographic variables by area of activity (healthcare, administrative, and operational) are presented in Table 1.

**Chart 1** – Distribution of population and sample by university. Paraná, Brazil, 2019-2020

University	Population	Sample
1	65	42
2	37	10
3	34	8
4	22	7
5	4	1
6	1	0
7	0	0

Source: Research data, (2007-2017).

**Table 1** – Sociodemographic characteristics variables according to the work activity performed by university technical-administrative staff retired due to disability (n=68). Paraná, Brazil, 2019-2020

Variables	Work Activity Performed						p-value*
	Health Professional		Administrative		Operational		
	n	%	n	%	n	%	
Age group (years)							
36 to 59	15	65.2	8	61.5	8	25.0	<b>0.005</b>
60 to 83	8	34.8	5	38.5	24	75.0	
Gender							
Female	22	95.7	9	69.2	16	50.0	<b>&lt;0.001</b>
Male	1	4.3	4	30.8	16	50.0	
Marital Status							
Without partner	17	73.9	11	84.6	24	75.0	0.724
With partner	6	26.1	2	15.4	8	25.0	
Education level							
Primary/High School	13	56.5	6	46.2	30	93.8	<b>&lt;0.001</b>
Higher education	10	43.5	7	53.8	2	6.3	
Monthly income** (minimum wages)							
≤ 3	11	47.8	6	46.2	20	62.5	0.447
> 3	12	52.2	7	53.8	12	37.5	
Weekly workload (hours)							
40	18	78.3	11	84.6	30	93.8	0.230
≥41	5	21.7	2	15.4	2	6.3	
Time working at university (years)							
1 to 15	11	47.8	5	38.5	13	40.6	0.820
16 to 33	12	52.2	8	61.5	19	59.4	

**Table 1** – Cont.

Variables	Work Activity Performed						p-value*
	Health Professional		Administrative		Operational		
	n	%	n	%	n	%	
Retirement time (years)							
1 to 10	12	52.2	7	53.8	23	71.9	0.265
11 to 19	11	47.8	6	46.2	9	28.1	

Source: Prepared by the authors.

\*Wald's chi-square; \*\*minimum wage in 2021:1,100.00 BRL (196,57 USD)

It was found that there was a significant predominance of healthcare and administrative professionals retired due to disability in the age group of 36 to 59 years old, as well as operational staff in the age group of 60 to 83 years old. There was still a prevalence of female health professionals and those with administrative activities who were retired due to disability and who had completed primary and secondary education among public employees who performed operational activities, which was expected, since complete primary education is the minimum education

level required to occupy this position. It should be noted that the healthcare professional category, who work in University Hospitals and School Clinics, was composed mainly of nursing workers.

The reasons for retirement due to disability, among the technical-administrative staff career of public universities, are shown in Table 2.

The multiple models of binary logistic regression of work activities performed by technical-administrative staff retired due to disability are shown in Table 3.

**Table 2** – Reasons for retirement according to work activity performed by university technical-administrative staff retired due to disability (n=68). Paraná, Brazil, 2019-2020

Reasons for retirement	Work Activity Performed					
	Healthcare Professional		Administrative		Operational	
	n	%	n	%	n	%
Infectious or parasitic disease	0	0.0	1	7.7	0	0.0
Neoplasia	3	13.0	2	15.4	4	12.5
Mental and behavioral disorder	10	43.5	3	23.1	4	12.5
Nervous system disease	0	0.0	2	15.4	2	6.3
Eye and adnexal diseases	0	0.0	0	0.0	5	15.6
Circulatory system disease	4	17.4	3	23.1	7	21.9
Musculoskeletal and connective tissue diseases	2	8.7	0	0.0	8	25.0
External cause of morbidity	4	17.4	2	15.4	2	6.3

Source: Prepared by the authors.

**Table 3** – Multiple models of binary logistic regression of work activities performed by university technical-administrative staff retired due to disability (n=68). Paraná, Brazil, 2019-2020

Multiple models*	p-value	Odds ratio	95% Confidence Interval
<b>Healthcare professional</b>			
Mental and behavioral disorder	0.040	4.004	1.067 – 15.031
Age group (≤59 x ≥60 years)	0.051	0.300	0.089 – 1.007
Gender (female x male)	0.011	0.060	0.007 – 0.530
<b>Administrative</b>			
Nervous system disease	0.024	15.808	1.446 – 19.757
Education level (primary/high school x higher education)	0.034	4.938	1.128 – 11.614
Age group (≤59 x ≥60 years)	0.294	0.433	0.091 – 2.063
Gender (female x male)	0.574	1.526	0.349 – 6.681
<b>Operational</b>			
Musculoskeletal and connective tissue diseases	0.039	11.210	1.124 – 21.810
Education level (primary/high school x higher education)	0.005	0.066	0.010 – 0.437
Age group (≤59 x ≥60 years)	0.274	2.089	0.558 – 7.817
Gender (female x male)	0.003	10.174	2.180 – 17.471

Source: Prepared by the authors.

\*Hosmer-Lemeshow test: 0.702; 0.804; 0.820; and Nagelkerke R Square: 0.387; 0.392; 0.534, respectively

The multiple models indicated that the odds of mental and behavioral disorders (MBD) were 4.004 times in healthcare professionals compared to those who were not, regardless of age, but associated with female gender. The chances of nervous system diseases were 15,808 times in people with administrative work, compared to those who were not, regardless of age and gender, but associated with higher education. The odds of musculoskeletal diseases were 11,210 times in people working in operational work, regardless of age, regarding primary/high school education and males.

## DISCUSSION

From the 68 university technical-administrative that participated in the study, most of those who were healthcare

professionals belonged to nursing, considered a profession with a predominant number of women, as well as one that performs strenuous workdays, due to shift rotation, with low wages in the Brazilian reality, resulting in other employment relationships or in additional hours of work<sup>(12)</sup>.

All these factors can be considered contributory to the deterioration of these professionals' health, to absenteeism throughout their careers, as well as to disability retirement. It is noteworthy that among the main factors for the illness of nursing workers are the high prevalence of stress associated with other health problems and musculoskeletal diseases<sup>(12)</sup>.

However, this is not a prerogative of nursing only, since the other work activities presented in this study are also associated with risks, harm and illness of the worker. A study developed among federal public employees showed that

workers with operational functions had increased chances of disability retirement, and mental and behavioral disorders are among the main causes of this outcome<sup>(13)</sup>.

As for gender, men are more present at work in the private sector, while women are the majority in the public sector<sup>(14)</sup>. Also, time in service indicates that workers in the public sector remain longer in the same employment than those in the private sector, which can be attributed to the stability offered in this sector<sup>(14)</sup>.

Women retired more due to disability in the administrative and healthcare areas, considering the disabling diseases of this group, especially the greater involvement of females by MBD<sup>(15)</sup>. This fact is related to the psychological distress manifested with symptoms of stress, anxiety, depression, which is greater among women, related to the ability to reconcile family and professional life, and job satisfaction<sup>(16)</sup>.

MBD constitute a public health problem due to the significant losses for workers regarding their health, social relationships and work<sup>(17)</sup>. Brazilian data on the reasons for granting ill-health benefits and disability retirement, from 2012 to 2016, showed that MBD are the third cause, with the highest frequency among women. However, when disability retirement is analyzed isolated, it is more prevalent among men<sup>(18)</sup>.

A study conducted in countries of the Organization for Economic Co-operation and Development (OECD) also revealed that MBDs made the disability pension more common among workers in these countries, especially among women<sup>(19)</sup>.

When considering the relationship between MBD and work in the healthcare area, there are several stressors, such as daily living with the disease, death, intense interpersonal interactions with patients, family members and co-workers, in addition to high workloads that impair leisure time and family life. In addition to these factors, there is work overload, precarious working conditions, limited control over the respective work and management pressures, all factors that trigger mental illnesses<sup>(20)</sup>.

MBD are highly prevalent health problems today and are responsible for disability and mortality worldwide. According to data from the World Health Organization (WHO), mental and neurological disorders and substance abuse, together, accounted for 13% of the global burden of disease in 2004. Currently, depression is responsible for 4.3% of the global burden of diseases and is among the most responsible for disability worldwide, corresponding to 11% of all years lived with a disability, with women being the most affected<sup>(21)</sup>.

The activities performed by technical-administrative staff at public universities are bureaucratic, and require responsibility and concentration, constituting stressful working

environments<sup>(22)</sup>. Stress causes chronic low-grade inflammation in the body, contributing to many chronic diseases, along with other factors such as genetic predisposition, aging, and lifestyle. Among these diseases, there are neurodegenerative, cardiovascular and psychotic disorders<sup>(23)</sup>.

The increased chances of neurological diseases in university technical-administrative staff who performed administrative activities may be related to the fact that, from the moment the public employee presents some progressive functional loss related to neurological diseases, he/she may have been readapted to function to meet their needs before the definitive leave due to disability.

Musculoskeletal and connective tissue diseases are not only a health problem, but also a social one, since they are highly prevalent in different countries and significantly contribute to disability among adults, favoring early absences from work<sup>(24)</sup>. The activities of operational workers are characterized by manual work and with significant physical load, contributing to the development of musculoskeletal and connective tissue diseases.

Workers who are aging, from 45 years old, experience a decrease in functional capacities and tend to advance in this loss progressively, if preventive measures and favorable working conditions are not adopted, with musculoskeletal diseases being some of the main problems related to workers health<sup>(25)</sup>.

When verifying the retirements among operational workers, the prevalent leave after the age of 60 may be related to functional losses, added to the lack of worker health care and the working conditions that favor the diseases, mainly musculoskeletal ones, which even constituted the first cause of disability in this professional category.

Lower education levels present a greater risk of incapacity for work<sup>(26)</sup>, in addition, male workers with lower educational levels generally perform tasks of greater physical load<sup>(27)</sup>. Continuous exposure to heavy physical effort, such as lifting or carrying weight at work, is associated with an increased risk of disability retirement due to musculoskeletal diseases<sup>(28)</sup>.

A study conducted in Finland showed that retirement due to disability is more frequent among individuals with education up to high school, corresponding to 12 years of study, and associated with work activities, such as, for example: rigid routines and greater physical effort. Moreover, it was shown that retirees had continuous absences from work in previous years<sup>(29)</sup>.

As for education level, in Brazil, positions that require less education lead to increased chances of retirement due to disability among workers<sup>(6,13)</sup>. These data corroborate what was found in this study, in which operational workers have a lower educational level, perform functions with manual

activities and greater physical load, mainly attributed to the male gender, verifying a greater chance of musculoskeletal disorders among this working class, regardless of age.

The working environment and the system in which university technical-administrative staff are inserted contribute to the worsening of the health of this class. It is necessary to implement programs that encourage the prevention of diseases, the adoption of healthy lifestyles and periodic medical evaluations, so that it is possible to intervene in modifiable risk factors and, thus, in the reduction of harm to workers' health. It is essential to implement projects aimed at the health and well-being of university employees, with the starting point being the analysis of data on the causes of leaves of employees from the institution and, consequently, the reduction of early retirements<sup>(30)</sup>.

Retirement due to disability, even though it is a guarantee for workers who become incapable of performing work activities, is not a lifetime benefit, as in some cases there may be recovery of health conditions and reversal of retirement, as provided for in the Social Security System of the State of Parana. This fact may have influenced the low adherence of disability retirees to participate in this research, as they may have had concerns that their pensions could be suspended according to Law No. 6.174, enacted on November 16, 1970, which establishes the legal framework for public employees in the Executive of the State of Paraná, which constituted a limitation of the study.

Other limitations of the study refer to the difficulty in acquiring contacts of retirees, the impossibility of in-person collection due to the COVID-19 pandemic, data collection in only one Brazilian state and the questionnaire with self-reported responses in which self-assessment may imply an information bias. Furthermore, there is a scarcity of scientific literature, especially national studies on the subject that could contribute to the discussion of the results found.

However, the study shows important data that require further study on mental and behavioral disorders as causes of permanent disability depending on gender and age, as well as on the chances of developing diseases of the nervous system. It also contributes to the development of new studies in the field of nursing, in which nurses can act in the prevention and monitoring of these diseases and comorbidities.

Regarding public management, especially at universities, the data show the importance of intervening in the factors associated with disability retirement among the work activities performed by university technical-administrative staff, conditions that are subject to intervention by managers, together with the workers.

## CONCLUSION

Among healthcare professionals, MBD were the main reasons for permanent disability related to female gender and age up to 59 years old. The chances of nervous system diseases were higher among administrative staff, associated with higher education. The operational staff were more likely to have diseases associated with being male and with primary education and high school.

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