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ORIGINAL ARTICLE

Prevalence of multimorbidity and associated factors in workers of a higher education institution

Prevalência de multimorbidade e fatores associados em trabalhadores de uma instituição de ensino superior

Prevalencia de multimorbilidad y factores asociados en trabajadores de una institución de educación superior

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ABSTRACT

Background and objectives: multimorbidity can generate disabilities, when associated with work, it affects the reduction of participation in the workforce, job turnover and early retirement. Thus, the objective was to estimate the prevalence and identify factors associated with multimorbidity in higher education institution workers. **Method:** this is a cross-sectional, quantitative study carried out with workers from a higher education institution (n=629) in the city of Ponta Grossa, PR, Brazil. For data collection, questionnaires with instruments from the Ministry of Health were used. The dependent variable referred to the presence of multimorbidity, and the independent variable referred to sociodemographic and work characteristics, use of health services, self-perceived health, presence of symptoms, lifestyle and eating habits. Chi-square test and logistic regression were performed. **Results:** the prevalence of multimorbidity was 53%, and it was associated with age (OR=2.99), overweight (OR=1.77), pain (OR=4.54), self-rated general health (OR=2.08) and self-rated oral health (OR=2.30) (p<0.05). Individuals with multimorbidity seek more follow-up by a Basic Health Unit (OR=0.54) and perform routine medical consultations more frequently (OR=0.83) (p<0.05). **Conclusion:** a high prevalence of multimorbidity was observed in the assessed workers, with a statistical association with biological factors, lifestyle, self-perceived health and access to health services. In this way, it is possible to outline strategies aimed at reestablishing workers' health, improving their quality of life.

Keywords: Multimorbidity. Risk Factors. Chronic Disease. Quality of Life. Occupational Health.

RESUMO

Justificativa e Objetivo: a multimorbidade pode gerar incapacidades, quando associada ao trabalho, afeta a redução da participação na força de trabalho, rotatividade de empregos e aposentadoria precoce. Assim, obje-

tivou-se estimar a prevalência e identificar fatores associados à multimorbidade em trabalhadores de instituições de ensino superior. **Método:** trata-se de um estudo transversal, quantitativo, realizado com trabalhadores de uma instituição de ensino superior (n=629) da cidade de Ponta Grossa, PR, Brasil. Para coleta de dados, foram utilizados questionários com instrumentos do Ministério da Saúde. A variável dependente referiu-se à presença de multimorbidade e a variável independente referiu-se às características sociodemográficas e laborais, utilização de serviços de saúde, autopercepção de saúde, presença de sintomas, estilo de vida e hábitos alimentares. Teste do qui-quadrado e regressão logística foram realizados. **Resultados:** a prevalência de multimorbidade foi de 53% e esteve associada à idade (OR=2,99), excesso de peso (OR=1,77), dor (OR=4,54), autoavaliação geral de saúde (OR=2,08) e -avaliação da saúde bucal (OR=2,30) (p<0,05). Indivíduos com multimorbidade procuram mais acompanhamento em Unidade Básica de Saúde (OR=0,54) e realizam consultas médicas de rotina com maior frequência (OR=0,83) (p<0,05). **Conclusão:** observou-se alta prevalência de multimorbidade nos trabalhadores avaliados, com associação estatística com fatores biológicos, estilo de vida, autopercepção de saúde e acesso aos serviços de saúde. Dessa forma, é possível traçar estratégias voltadas ao restabelecimento da saúde do trabalhador, melhorando sua qualidade de vida.

Palavras-chave: Multimorbidade. Fatores de risco. Doença crônica. Qualidade de vida. Saúde Ocupacional.

RESUMEN

Justificación y Objetivo: la multimorbilidad puede generar discapacidades, cuando asociada al trabajo incide en la reducción de la participación laboral, la rotación laboral y la jubilación anticipada. Así, el objetivo fue estimar la prevalencia e identificar factores asociados a la multimorbilidad en trabajadores de instituciones de educación superior. **Método:** se trata de un estudio transversal, cuantitativo, realizado con trabajadores de una institución de enseñanza superior (n=629) de la ciudad de Ponta Grossa, PR, Brasil. Para la recolección de datos, se utilizaron cuestionarios con instrumentos del Ministerio de Salud. La variable dependiente se refirió a la presencia de multimorbilidad, y la variable independiente a las características sociodemográficas y laborales, uso de servicios de salud, autopercepción de salud, presencia de síntomas, estilo de vida y hábitos alimentarios. Se realizaron pruebas de chi-cuadrado y regresión logística. **Resultados:** la prevalencia de multimorbilidad fue del 53% y se asoció con la edad (OR=2,99), el sobrepeso (OR=1,77), el dolor (OR=4,54), la autopercepción de salud general (OR=2,08) y la autopercepción. salud bucal valorada (OR=2,30) (p<0,05). Los individuos con multimorbilidad buscan más seguimiento por una Unidad Básica de Salud (OR=0,54) y realizan consultas médicas de rutina con mayor frecuencia (OR=0,83) (p<0,05). **Conclusión:** se observó una alta prevalencia de multimorbilidad en los trabajadores evaluados, con asociación estadística con factores biológicos, estilo de vida, autopercepción de salud y acceso a los servicios de salud. De esta forma, es posible delinear estrategias encaminadas a restablecer la salud de los trabajadores, mejorando su calidad de vida.

Palabras clave: Multimorbilidad. Factores de riesgo. Enfermedad crónica. Calidad de vida. Salud ocupacional.

INTRODUCTION

Multimorbidity is a topic much discussed today. With different concepts, it can be understood as the simultaneous occurrence of health problems[1] a result of the involvement of two or more chronic diseases.[2,3] In a cross-sectional study carried out in Brazil, with data from the Brazilian National Health Survey (PNS - *Pesquisa Nacional de Saúde*) 2013, it was observed that 24.2% of Brazilians had multimorbidity.[4] Similar data were found in a cross-sectional survey carried out in Latin American and Caribbean countries, considering self-reported multimorbidity, in which 16.8% of Brazilians, 25.1% of Jamaicans and 14.4% of Mexicans self-reported as multimorbid.[2] Also, in an investigation conducted in New Zealand, it was possible to observe an incidence of multimorbidity of 68.5 per 1,000 person-years, which demonstrates the importance of discussing the topic.

It is noteworthy that the presence of a health problem is considered a constant concern in the primary health sector. The association of diseases is an even greater problem, as it can generate several disabilities

and develop several limitations for the individual,[5] with loss of autonomy and quality of life.

Multimorbidity can increase the risk of hospitalizations, premature deaths, loss of physical functioning and depression.[6] Moreover, this condition increases medication consumption as well as use and expenses related to health services.[7] Thus, considering its severity and the impact related to quality of life, multimorbidity is a-public health challenge.

When related to the work environment, chronic diseases and, consequently, multimorbidity, can affect participation in the workforce, favoring job turnover and early retirement, resulting in compromised earnings, wages and positions held,[8] contributing to the increase of existing social inequities and poverty.

It is noteworthy that working conditions can generate risk factors for the development of chronic disease. The lack of time for adequate food and regular physical activity, in addition to other factors related to work environments, added to the level of stress produced, are determining factors for the occurrence of diseases in

workers. [9] Thus, it is necessary to know workers' living and working conditions, as health in the work environment directly affects their performance.

Also, the need for institutional public policies to manage risk factors for NCDs in work spaces is highlighted, which are considered important for promoting comprehensive health care for workers, including carrying out periodic occupational medical examinations, screening risk factors and health-promoting directive strategies.

Considering the above, this study aimed to estimate the prevalence and identify factors associated with multimorbidity in higher education institution workers.

METHOD

A cross-sectional, quantitative, exploratory, descriptive study was carried out, based on data from an extension project entitled "Pró-Servidor", which assists in a multidisciplinary health team the workers of a public institution of Brazilian higher education in Ponta Grossa, PR (n=830).

The target population consisted of workers who occupy the positions of university agents on a temporary and effective basis (n=629). University agents are responsible for planning, organizing and executing tasks necessary for higher education. The functions of general service assistant, security and operational agents, drivers, laboratory technician, librarian, designer, cameraman, diagrammer, programmer, journalist, civil engineer, administrators, accountants, lawyers, agriculture and livestock and their secretaries, technicians and assistants enter the hall of university agents of the institution under investigation. Nutritionists, psychologists, social workers, nurses, dental surgeons and their technicians and assistants are also considered health professionals.

Workers who performed the function of university agent, at the secondary, technical and higher levels, temporary or permanent, public tender or CLT, who were active in the function performed, participated in the study. Teachers, as well as newly hired workers, individuals who were on sick leave or on vacation, who were away due to training courses (specialization, master's degree or doctoral degree) or who were out of town and did not want to participate in the study were excluded.

Data collection took place between October and November 2018. The dependent variable referred to the presence or absence of multimorbidity. This variable was created from the analysis of responses to self-reported medical diagnoses of the presence of chronic diseases. This information was obtained from the questioning of the most prevalent NCDs, including hypercholesterolemia, hypertension, depression, diabetes, work-related musculoskeletal disorder (WRMD), chronic obstructive pulmonary disease (COPD), asthma, heart disease, nephropathy, cancer, renal failure and retinopathy, with yes and no response patterns, and the question "do you have other NCD(s), which one(s)?". Individuals who presented the co-occurrence of two or more chronic conditions made up the group with multimorbidity, while for the group without multimorbidity, the presence of only one or no chronic disease was considered. As independent variables, sociodemographic (sex, age, marital status, number of children, color, education and income) and work characteristics (employment, work regime and intense physical effort), use of health services (being followed up by a Basic Health Unit and date of the last medical consultation), perceived health (self-rated general health and self-rated oral health), presence of symptoms (presence of pain, when on a slope, feels chest discomfort), lifestyle (spends a lot of time sitting, performs physical activity, alcohol consumption frequency, smokes, overweight and malnutrition history) and eating habits (consumption of vegetables and/or fruits, red meat, white meat, fat, fried foods and embedded foods, soft drinks, carbohydrates and sweets) were considered.

For data collection, we used a questionnaire containing sociodemographic and work characteristics, lifestyle, eating habits, chronic disease and sequel history, use of health care and social assistance services, a test to identify problems related to the use of alcohol, and self-perceived health, compiled from instruments validated and used by the Ministry of Health to diagnose Brazilians' health situation.[10] Furthermore, specific assessments were carried out in the areas of nursing, physiotherapy, dentistry and pharmacy, which were not considered in the present study.

Data collection had a multidisciplinary team composed of physiotherapists, dentists, nurses, pharmacists and social workers, and it took place in a systematic way, through five health stations conducted by professionals who carried out investigations regarding their area of training.

The collected data were tabulated in Microsoft Excel 2013®. The results obtained were analyzed using absolute and relative frequency. To verify the association between the dependent variable and the independent variables, the chi-square test was initially performed. Subsequently, a logistic regression analysis was performed using the Stepwise input method, based on the likelihood value, and to estimate the magnitude of the effect of each variable by calculating the Odds Ratio (OR) and their respective 95% confidence intervals (CI). The variables that presented a p-value ≤0.20 in the bivariate analysis were selected to enter the multiple model, with those that reached p≤0.05 and/or adjusted to the model remaining in the model.

The research was approved by the Institutional Review Board of a higher education institution (99995518.4.0000.0105), under Opinion 3.056.856/2018, respecting the dictates of resolution 466/12 of the Brazilian National Health Council (Conselho Nacional de Saúde) and the Declaration of Helsinki.

RESULTS

The final sample consisted of 629 workers, and it was possible to verify that 53% of those assessed had multimorbidity, according to self-reported health information. Regarding the profile of the sample, there was a

predominance of women, aged over 40 years, married or in a stable relationship, with 2 children. Most were white, attended higher education or graduate studies, with an income of more than R$3,000.00 (about US$545.45), with a public tender and working 40 hours per week (Table 01).

The sociodemographic characteristics that were associated with multimorbidity were sex, age, marital status, number of children, education, income and employment relationship (p<0.05) (Table 01).

Most workers did not have health follow-up by any Basic Health Unit (BHU) or Family Health Strategy (FHS), but underwent a routine medical consultation less than 6 months ago and self-rated their general and oral health as good.

The presence of self-reported pain was reported by most workers; however, most did not report chest pain when climbing a slope. Most university agents spent a large period of time sitting, did not perform physical activity and did not do intense physical exertion at work. There was a prevalence of individuals who did not smoke and did not consume alcoholic beverages (Table 02).

Being followed by a BHU, date of the last routine medical consultation, self-rated general and oral health, presence

Table 1. Sociodemographic and work profile of servants of a Higher Education Institution, according to multimorbidity. Ponta Grossa, PR, Brazil, 2018 (n=629).

| Variables | Multimorbidity | | | |
	YES n(%)	No n (%)	Total n(%)	p-value
Presence of multimorbidity	334 (53.1)	295 (46.9)	629 (100)	
Sex				
Female	200 (59.9)	132 (44.7)	332 (52.8)	p<0.001
Male	134 (40.1)	163 (55.3)	297(47.2)	
Age				
18-30	12 (3.6)	50 (16.9)	62 (9.9)	p<0.001
31-40	31 (9.3)	64 (21.7)	95 (15.1)	
41-50	99 (29.6)	79 (26.8)	178(28.3)	
51-60	150 (44.9)	83 (28.1)	233(37.0)	
Over 60 years	42 (12.6)	19 (6.4)	61(9.7)	
Marital status				
Single	55 (16.5)	92 (31.2)	147(23.4)	p<0.001
Married/stable union	205 (61.4)	171 (58.0)	376(59.8)	
Divorced	56 (16.8)	24 (8.1)	80(12.7)	
Widowed	18 (5.4)	8 (2.7)	26(4.1)	
Number of children				
1	79 (23.7)	128 (43.4)	207 (32.9)	p<0.001
2	157(47.0)	120 (40.7)	277 (44.0)	
3 or more	98 (29.3)	47 (15.9)	145 (23.1)	
Color				
White	266 (79.6)	244 (82.7)	510(81.1)	0.326
Other	68 (20.4)	51 (17.3)	119 (18.9)	
Education				
Graduate degree	99 (29.6)	104 (35.3)	203 (32.3)	0.002
Higher education degree	63 (18.9)	82 (27.8)	145 (23.1)	
High school degree	146 (43.7)	95 (32.2)	241 (38.3)	
Elementary school degree	26 (7.8)	14 (4.7)	40 (6.4)	
Income				
Up to 2,000	42 (12.5)	65 (22)	107(17.1)	0.010
2,001-3,000	49 (14.7)	45 (15.3)	94(14.9)	
3,001-4,000	78 (23.4)	62 (21)	140(22.3)	
4,001-5,000	84 (25.1)	50 (16.9)	134(21.3)	
5,001-7,000	44 (13.2)	33 (11.2)	77(12.2)	
More than 7,001	34 (10.2)	38 (12.9)	72(11.4)	
Did not answer	3 (0.9)	2 (0.7)	5(0.8)	
Working relationship				
Approved in public tender	294 (88.0)	217 (73.6)	511(81.2)	p<0.001
CLT employee	40 (12.0)	78 (26.4)	118(18.8)	
Working regime				
20 hours	9 (2.7)	10 (3.4)	19(3.0)	0.611
40 hours	325 (97.3)	285 (96.6)	610(97.0)	

Statistical test: chi-square (p<0.05).

Table 2. Use of health services, self-perceived health and lifestyle of servants of a higher education institution, according to multimorbidity. Ponta Grossa, PR, Brazil, 2018 (n=629).

Variables	Multimorbidity			p-value
	YES n(%)	No n (%)	Total n(%)	
Followed up by some BHU*				
No	271 (81.1)	260 (88.1)	531 (84.4)	0.016
Yes	63 (18.9)	35 (11.9)	98 (15.6)	
Date of last routine medical consultation				
Less than 6 months ago	204 (61.1)	142 (48.1)	346 (55)	p<0.001
Between 6 months and 1 year ago	72 (21.6)	55 (18.6)	127 (20.2)	
Between 1 and 2 years ago	29 (8.7)	47 (15.9)	76 (12.1)	
More than 2 years ago	29 (8.7)	51 (17.3)	80 (12.7)	
Self-rated general health				
Bad	18 (5.4)	4 (1.4)	22 (3.5)	p<0.001
Regular	122 (36.5)	46 (15.6)	168 (26.7)	
Good	194 (58.1)	245 (83.1)	439 (69.8)	
Self-rated oral health				
Bad	51 (15.3)	19 (6.4)	70 (11.1)	0.001
Regular	126 (37.7)	104 (35.3)	230 (36.6)	
Good	157 (47.0)	172 (58.3)	329 (52.3)	
Presence of pain				
No	76 (22.8)	177 (60)	253 (40.2)	p<0.001
Yes	258 (77.2)	118 (40)	376 (59.8)	
When goes up a slope, feels chest discomfort				
No	248 (74.3)	269 (91.2)	517 (82.2)	p<0.001
Yes	86 (25.7)	26 (8.8)	112 (17.8)	
Spends a lot of time sitting				
No	150 (44.9)	141 (47.8)	291 (46.3)	0.469
Yes	184 (55.1)	154 (52.2)	338 (53.7)	
Physical activity				
No	202 (60.5)	144 (48.8)	346 (55.0)	0.003
Yes	132 (39.5)	151 (51.2)	283 (45.0)	
Makes intense physical effort at work				
No	251 (75.1)	231 (78.3)	482 (76.6)	0.351
Yes	83 (24.9)	64 (21.7)	147 (23.4)	
Alcohol consumption frequency				
Never	204 (61.1)	150 (50.8)	354 (56.3)	0.041
Monthly or less	35 (10.5)	30 (10.2)	65 (10.3)	
Up to 04 times a month	65 (19.5)	76 (25.8)	141 (22.4)	
02 times or more per week	30 (9.0)	39 (13.2)	69 (11.0)	
Smoker				
No	276 (82.6)	262 (88.8)	538 (85.5)	0.028
Yes	58 (17.4)	33 (11.2)	91 (14.5)	

*Statistical test: chi-square (p<0.05). *BHU – Basic Health Unit.*

of pain, feeling chest discomfort when climbing a slope, performing physical activity, in addition to smoking and consuming alcoholic beverages were characteristics that were associated with multimorbidity (p<0.05) (Table 02).

Regarding nutritional status and body weight, it was observed that most workers had no malnutrition or overweight history, but most of them were overweight. As for eating habits, it was noticed that most servers ingested fruits, vegetables and carbohydrates daily, but did not regularly consume red meat and white meat, fat, fried foods and sausage foods, soft drinks and sweets. Of these variables, only overweight and malnutrition history were characteristics that were associated with multimor-

bidity (p<0.05) (Table 03).

The multivariate analysis showed that the older the worker age, the greater the chances of multimorbidity, since workers over 60 years of age were 5.91 more likely to have this condition (p<0.05). The same occurred with overweight and presence of pain, increasing in 1.77 and 4.54, respectively, the chances of having multimorbidity (p<0.05). Self-rated oral health and self-rated general health also increased the chance of multimorbidity, and workers who self-rated their health as regular, respectively, have 2.08 and 2.30 more chances to develop multimorbidity (p<0.05). Individuals with multimorbidity seek further follow-up by a BHU (OR=0.54) and perform

Table 3. Nutritional status and eating habits of servants of a higher education institution, according to multimorbidity. Ponta Grossa, PR, Brazil, 2018 (n=629).

| Variables | Multimorbidity | | | |
	YES n(%)	No n (%)	Total n(%)	p-value
Malnutrition history				
No	317 (94.9)	290 (98.3)	607 (96.5)	0.021
Yes	17 (5.1)	5 (1.7)	22 (3.5)	
Overweight history				
No	188 (56.3)	206 (69.8)	394 (62.6)	p<0.001
Yes	146 (43.7)	89 (30.2)	235 (37.4)	
Vegetables and/or fruits				
Daily	252 (75.4)	219 (74.2)	471 (74.9)	0.727
Not every day	82 (24.6)	76 (25.8)	158 (25.1)	
Red meat				
Daily	77 (23.1)	75 (25.4)	152 (24.2)	0.488
Not every day	257 (76.9)	220 (74.6)	477 (75.8)	
White meat				
Daily	41 (12.3)	36 (12.2)	77 (12.2)	0.978
Not every day	293 (87.7)	259 (87.8)	552 (87.8)	
Fat, fried foods and processed foods				
Daily	18 (5.4)	16 (5.4)	34 (5.4)	0.985
Not every day	316 (94.6)	279 (94.6)	595 (94.6)	
Soft drinks				
Daily	35 (10.5)	32 (10.8)	67 (10.7)	0.881
Not every day	299 (89.5)	263 (89.2)	562 (89.3)	
Carbohydrates				
Daily	262 (78.4)	243 (82.4)	505 (80.3)	0.216
Not every day	72 (21.6)	52 (17.6)	124 (19.7)	
Sweets				
Daily	90 (26.9)	90 (30.5)	180 (28.6)	0.324
Not every day	244 (73.1)	205 (69.5)	449 (71.4)	

Statistical test: chi-square (p<0.05).

Table 4. Adjusted multiple analysis of the association between multimorbidity and independent variables. Ponta Grossa, PR, Brazil, 2018 (n=629).

| Variable | Multimorbidity | |
	Adjusted OR (95% CI)	p-value
Age		
18-30	1.00	p<0.001
31-40	1.29 (0.56-2.98)	0.546
41-50	2.99 (1.40-6.40)	0.005
51-60	4.80 (2.27-10.15)	p<0.001
Over 60 years	5.91 (2.36-14.84)	p<0.001
Overweight		
No	1.00	p<0.001
Yes	1.77 (1.20-2.60)	
Pain		
No	1.00	p<0.001
Yes	4.54 (3.06-6.72)	
Self-rated general health		
Positive	1.00	0.004
Negative	1.73 (0.52-1.34)	0.375
Regular	2.08 (1.34-3.23)	0.001
Self-rated oral health		
Positive	1.00	0.048
Negative	1.12 (0.75-1.68)	0.580
Regular	2.30 (1.19-4.46)	0.014
Medical consultation frequency		
Less than 6 months ago	1.00	0.016
Between 6 months and 1 year ago	0.83 (0.51-1.34)	0.444
Between 1 and 2 years ago	0.54 (0.30-0.98)	0.043
More than 2 years ago	0.43 (0.24-0.77)	0.005
Followed up by some BHU*		
Yes	1.00	0.025
No	0.54 (0.32-0.92)	

*Statistical test: logistic regression with 95% confidence interval. *BHU – Basic Health Unit.*

routine medical consultations more frequently (OR=0.83) (p<0.05) (Table 04).

DISCUSSION

The prevalence of multimorbidity found among university agents at the institution (53%) was similar to that found in a cross-sectional study carried out with technical-administrative employees of a college in Rio de Janeiro, where 51.1% of women and 34.7% of men had multimorbidity.[11] Still, in cross-sectional census surveys carried out with workers from a municipal health network and fairgrounds, it was found that 42.3%[12] and 48.5%,[13] respectively, were multimorbid.

It is known that working conditions and work processes in which individuals are inserted can impact their health.[13] In relation to the work developed by most subjects of this study, although it is not considered as an analysis variable, according to previous studies with professionals from higher education institutions, it can be inferred that they are considered passive jobs,[14] defined by presenting low control and low psychological demand.[15]

A study carried out with a similar public in a federal educational institution found that 34.6% of employees were in passive work, and the authors suggest that this type of work activity has the potential to generate loss of skills and interest in work.[15] As a result, it may lead workers to become passive to other aspects related to their habits and lifestyle,[14] inferring risks to their living conditions.

Also, it is worth noting that, among the dozens of positions available at the higher education institution for university agents in the various qualification levels, a large part performs functions in sedentary jobs, i.e., with low physical load, performed predominantly in the sitting position, with little alternation of posture and functional performance of repetitive movements of the upper limbs.[16] A sedentary lifestyle at work is one of the risk factors for chronic diseases, which may explain the prevalence of multimorbidity found in the present study.[16]

Added to this context, public servants are exposed in their work environment to several stressors, which can favor the triggering of health problems, such as intense service load, insufficient human resources, precariousness of physical structures and public management, government policy changes that alter work routines and processes, among others.[15]

Furthermore, multimorbidity makes individuals more susceptible to diseases and acute health events [17], directly affecting their practice and efficiency at work. Thus, there is an imminent need to carry out health actions aimed at this group, in addition to carrying out more studies that address this issue.

With regard to sociodemographic characteristics, lifestyle and health data, it was found that age, overweight, pain, self-rated general health, self-rated oral health, medical consultation frequency and being followed up by a BHU were factors that increased the chances of workers having multimorbidity.

In the present study, advancing age can significantly increase the chances of having multimorbidity, in line with national and international literature.[1,3,13] It should be noted that the transition from adult to older adult represents the most critical phase for the simultaneous occurrence of chronic diseases.[18] As observed in the findings of this study, there are significant increases in the odds ratio of the individual having multimorbidity from the age of 40 onwards. This can be explained by exposure to stressful events suffered by individuals throughout life, in a cumulative way, compromising the physiological balance and facilitating the onset of chronic diseases, [6] frequent conditions among older adults. [1]

Another factor that was associated with multimorbidity was overweight. In a study carried out with data from PNS (2013), it was found that more than half of Brazilians were overweight.[19] A sedentary lifestyle associated with an inadequate diet can result in overweight and even obesity and trigger a series of health complications, in particular, the predisposition or worsening of several chronic diseases, justifying the association found.

It is emphasized that eating habits and lifestyle did not remain associated with multimorbidity in this study's final model, contrary to what was found in the literature, where the presence of an inadequate diet and physical inactivity were considered risk factors for many chronic diseases. [9] However, overweight, a consequence of inappropriate habits, was shown to be associated with multimorbidity. Thus, the need for adequate nutrition, associated with physical activity practices, is highlighted, since it will bring benefits not only linked to weight loss, but also to an improvement in workers' health condition and quality of life, reducing the chances of having multimorbidity.

The effectiveness of physical activity goes beyond weight reduction. In a cross-sectional study carried out with Primary Health Care users, it was possible to verify that physical exercise contributes as a protective factor for the onset of chronic pain.[20] Thus, it is possible to explain the association found between pain and presence of multimorbidity.

Pain contributed significantly to increasing the chances of workers having multimorbidity, which is one of the main complaints of people with chronic diseases.[21] It is related to symptoms of anxiety and depression, affecting the population's quality of life, compliance with treatment of possible diseases and self-care.[22] Furthermore, when persistent, pain can exacerbate symptoms and worsen sleep quality,[23] reducing productivity and worsen workers' emotional indicators. Thus, individuals who have pain and multimorbidity have their quality of life reduced, in addition to worse health. Thus, actions are needed to reduce pain in university workers, as it will contribute to improving their health and, consequently, the work process.

According to a literature review, the ergonomic intervention on the sedentary work place, the main scenario of action of the agents investigated in this research, with the promotion of strategies for alternating posture between sitting and standing, was able to reduce complaints such as pain and tiredness, improve mood, enhance physical activity practices and reduce risks for chronic diseases.[16]

Medical consultation frequency and being followed up by some BHU revealed to be more frequent among workers with multimorbidity, which coincides with the literature that demonstrates an increase in the chance of multimorbid patients using health services.[13] In addition to this, it was possible to observe in a cross-sectional investigation that 43.3% of respondents who had multimorbidity reported having attended consultations in a period of less than one year, [9] demonstrating that the use of health is recurrent in individuals who have some disease.

In the present study, the presence of multimorbidity also had an impact on workers' self-perceived health, both in the general context[24] and in the oral context.[25] These findings reinforce the importance of using these parameters, of simple measurement, as a strategy for monitoring and risk stratification, with regard to workers' health, with a view to subsidizing adequate and timely care.

Considering the above, it is worth noting that there is an imminent need for a preventive approach at the population and individual level, with the aim of encouraging changes in unhealthy behaviors and promoting good habits. [8] For instance, encouraging physical activity, healthy eating and reducing tobacco consumption in the work environment are excellent measures to reduce risk factors for the aforementioned conditions.[8]

Also, health professionals, responsible for health care management, should take a precautionary look at the profile elucidated here of risk factors for multimorbi-

dity. It is also noteworthy that universities have the structure and conditions to implement health actions for their workers, spending low cost and taking advantage of the academic community for such accomplishment. In this way, they can develop systematic and continuous monitoring strategies for these individuals, with a view to preventing complications due to the decompensation of multimorbidity and maintaining health to guarantee quality of life.

One of the limitations of this study is the non-participation of individuals on sick leave and the analyzed responses that are self-reports of previous diagnoses, which may mask the prevalence of current multimorbidity. Furthermore, this is a cross-sectional study, and it is not possible to establish cause and effect relationships. However, the findings shown here are extremely relevant for the deepening of knowledge about the subject and respond to the scope of the study.

In conclusion, a high prevalence of multimorbidity was observed in workers from a public higher education institution. Factors such as advanced age, overweight, presence of pain, negative self-rated general health and self-rated oral health, higher medical consultation frequency and being followed up by a BHU significantly increased the chances of university agents having multimorbidity.

The findings demonstrated in this study will provide the opportunity for university managers to use strategies aimed at restoring workers' health, such as actions aimed at improving ergonomics in the work environment, organization of groups to perform physical activities, routine medical consultations, in addition to a multidisciplinary approach, aiming at an improvement in the quality of life and, consequently, a better disposition to the work process.

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Geiza Rafaela Bobato and Danielle Bordin - Data analysis and interpretation

Geiza Rafaela Bobato and Midiã Vanessa dos Santos Spekalski – Discussion of results

Luciane Patrícia Andreani Cabral, Clóris Regina Blanski Grden and Cristina Berger Fadel – Content writing and/or critical review

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