
WORK PERFORMED THROUGHOUT THE LIFE OF RETIREES AND FACTORS ASSOCIATED WITH PHYSICAL INACTIVITY AND HEALTH CONDITIONS**TRABALHO REALIZADO AO LONGO DA VIDA DE APOSENTADOS E FATORES ASSOCIADOS A INATIVIDADE FÍSICA E CONDIÇÕES DE SAÚDE**Pollyanna Natalia Micali ¹ and Jamile Sanches Codogno ¹

São Paulo State University, Rio Claro-SP, Brazil.

RESUMO

Este estudo teve como objetivo identificar as doenças crônicas mais prevalentes entre os aposentados da cidade de Rio Claro-SP e possíveis associações de trabalho realizado durante a vida (manual ou intelectual) com inatividade física, índice de massa corporal, doenças e gastos com serviços de saúde. Trata de um estudo transversal realizado em dois momentos (2014 e 2018). Instrumentos utilizados para coleta de dados: Inquérito de Morbidades Referidas; Questionário desenvolvido por Pimenta (2006); Internacional Physical Activity Questionnaire; Índice de massa corporal. Os testes estatísticos aplicados foram o teste Qui-quadrado, de Kruskal-Wallis e Mann Whitney com o ajuste de Bonferroni. A amostra do presente estudo foi composta por 171 aposentados, com maior prevalência de casados (81,3%), com ensino médio incompleto (53,8%), classe econômica "C" (49,1%), trabalho manual realizado ao longo da vida (54,4%), obesos (49,1%) e sedentários (33,9%). A análise de associação demonstrou que a maioria da amostra que realizou trabalho manual ao longo da vida associando a hipertensão (valor de $p = 0,01$) e osteoartrite (valor de $p = 0,01$). Conclui-se que o trabalho manual parece apresentar maior risco para o desenvolvimento de doenças crônicas.

Palavras-chave: Aposentadoria. Trabalho. Comportamento Sedentário. Doença Crônica. Planejamento em saúde.**ABSTRACT**

This study aimed to identify the most prevalent chronic diseases among retired residents in the city of Rio Claro-SP and possible associations of work performed during their lives (manual or intellectual) with physical inactivity, body mass index, diseases, and expenses with health services. This is a cross-sectional population study with retired individuals, performed at two moments (2014 and 2018). Instruments used for data collection: Survey of Referred Morbidities; Questionnaire developed by Pimenta (2006); International Physical Activity Questionnaire; Body mass index. The statistical tests applied were the Chi-square test, by Kruskal-Wallis and Mann Whitney with the Bonferroni adjustment. The sample of the present study was composed of 171 retirees, with the highest prevalence of married individuals (81.3%), with secondary education incomplete (53.8%), economic class "C" (49.1%), manual work performed throughout life (54.4%), obese (49.1%), and sedentary (33.9%). The association analysis demonstrated that the majority of the sample who performed manual work throughout life was associated with hypertension ($p = 0.01$) and Osteoarthritis ($p = 0.01$). It is concluded that manual labor seems to present a greater risk for the development of chronic diseases.

Key-words: Retirement. Employment. Sedentary Behavior. Chronic Disease. Health Planning.**Introduction**

The World Health Organization elected four major modifiable risk factors to development of chronic diseases (CDs). They include tobacco use, physical inactivity (PI), inadequate diet, and harmful alcohol use¹. In this sense, studies have shown that the time spent in sedentary behaviors associated inadequate diet increase the risks of developing hypertension and obesity, can evolve to other comorbidities^{2,3}.

The British magazine *The Lancet* published its first series on physical activity (PA) in 2012, pointing out that PI is considered an important modifiable risk factor for the prevention and control of CDs. Subsequently, the second series of the study was updated and presented, including progress in epidemiological research, global surveillance, intervention strategies, and policy actions on joint health effects in relation to sedentary behavior and PA, with the first global estimate of the economic burden of PI⁴.

Due to population aging, many governments have implemented measures that stimulate extended working practices and discourage early departure from the workforce⁵. The Longitudinal Study of Health of the Elderly (EISI), in an international research on aging, pointed out that in 2018, 39.5% of older adults suffered from a CD and almost 30% had two or more, accounting for almost 70% of the elderly⁶.

Work performed throughout life may be relevant in this context, since the majority of people spend a large part of their lives in work activities, a cause for concern, as prolonged exposure to adverse work conditions could adversely affect health at more advanced ages⁷. Previous research on public and economic health suggests that working beyond the age of retirement presents multifactorial determinants, that is, characteristics of the work performed, health conditions, social factors, and socioeconomic factors⁸.

However, the aging population brings health problems that challenge the health and social security systems⁹. Demand has increased considerably in recent years; the number of active financial benefits granted by the Ministry of Social Security increased by 55.3% between 2002 and 2012¹⁰.

Thus, it is fundamental to identify the factors related to the health of this population and, possibly, to invest in prevention actions throughout the life course, especially where people spend most of their time (work), in order to create alternatives to minimize future problems and aggravations. This study aimed to identify the most prevalent chronic diseases among retired residents in the city of Rio Claro-SP and possible associations of work performed during their lives (manual or intellectual) with physical inactivity, body mass index, diseases, and expenses with health services.

Materials and Methods

A cross-sectional population study involving retired people of both sexes, living in the city of Rio Claro-SP. The present study consisted of 2 moments, the first being in 2014 and the second in 2018, according to the design described from previous study¹¹.

At the second moment (the present study), individuals who were retired in 2014 (n=205 retirees) and those who reported the prospect of retiring in the following three years (n=95 individuals) were investigated, totaling 300 individuals. Thus, the sample consisted 171 of retired people who met the following criteria: inclusion: i) having participated in the study in 2014, ii) residing in the city of Rio Claro-SP, and iii) agreeing to participate in the study and signing the free and informed consent form; and exclusion: i) not being institutionalized (hospitals, long-term institutions – asylums, and prisons, and ii); inability to respond to research tools.

All participants signed a free and informed consent form, approved by the Ethics and Research Committee of the Universidade Estadual Paulista (Unesp). The ethical principles were also assured to the interviewees, according to Resolution 466/2012 of the National Health Council.

Collection instruments

For the independent variable, a structured questionnaire was used to identify the work performed during life (before retirement) that was later classified as manual work, which implies greater physical effort with energy expenditure greater than 5 METs or intellectual (implies higher mental effort and energy expenditure less than 5 METs)¹².

To detect the dependent variables, the following were used:

- The Referred Morbidity Questionnaire developed by Freitas Júnior from and collaborators¹³. This instrument contains information on: i) time of diagnosis of the disease; ii)

use of medicines; and iii) occurrence of diseases among blood relatives. It consists of closed questions that enable identification of the presence or absence of diagnoses for CDs.

- A questionnaire developed by Pimenta¹⁴ was adapted to investigate expenditures on health services. The instrument contains information on: i) a record of the number of hospitalizations, consultations, and examinations performed in the previous 12 months, ii) the name and number of medications used continuously. Expenditures were calculated according to the National Health Surveillance Agency's price list and the Health Price Bank¹⁵.

- The International Physical Activity Questionnaire (IPAQ) adapted (short version) was applied to investigate level of physical activity, evaluated by means of 15 questions¹⁶. The frequency and duration questions were grouped in a single question in their respective domains and intensities (3.5 mets for light PA, 6 mets for moderate PA, 8 mets for vigorous PA). To calculate the value of caloric expenditure of PA¹⁷.

$$\text{Kcal} = \text{MET of physical activity} \times \text{Body weight (Kg)/60} \times \text{Time of activity (min)}$$

Subsequently, the individuals were classified as sedentary (<500 kcal/wk), insufficiently active (<1000 kcal/wk), active (between 1000 and 2000 kcal/wk), and very active (> 2000 kcal/wk)¹⁸.

To calculate the body mass index (BMI), the values of body mass and height were used, self-reported at the time of the interview. The classification adopted complied with the criteria proposed for the elderly population, being: <22 kg/m² malnutrition, ≥ 22 – 26.9 kg/m² eutrophic, ≥ 27 kg/m² obese¹⁹.

Statistical analysis

For the categorical variables, the descriptive analysis was performed and the values presented as absolute (n) and relative (%) frequencies. To verify the normality of the data, the Shapiro Wilks test was used. Subsequently the Chi-squared test was adopted to analyze the association between the dependent variable and the other independent variables, and the nonparametric comparison test (Kruskal-Wallis), followed by the Mann Whitney test with the Bonferroni adjustment, to verify the possible differences between groups. All tests were performed in the statistical software Statistical Package for the Social Sciences (SPSS) version 20.0, adopting a significance level of 5%.

Results

According to the results, the profile of the total sample, according to descriptive characteristics, presented a similar distribution between men and women.

Table 1. Distribution of absolute and relative frequencies (%) of the categorical variables referring to the personal, educational and financial factors of the sample (n = 171, Rio Claro -SP, 2018)

Variables		Absolute Frequency (n)	Relative Frequency (%)
Sex	Feminine	82	48
	Male	89	52
Age range	50-58 years	20	11,7
	59-67 years	60	35,1
	68-76 years	45	26,3
	77-85 years	39	22,8
	> 86 years	7	4,1
Marital status	Married / cohabited	139	81,3
	Widower	22	12,9
	Single / divorced	10	5,9
Education	Up to 4th grade	19	11,1
	Incomplete high school	92	53,8
	Complete high school /high	60	35,1
Economic class	A and B	78	45,6
	C	84	49,1
	D and E	9	5,3
Type of retirement	Service time	112	65,5
	Age	49	28,7
	Invalidity	7	4,1
	Compulsory	1	0,6
	Special	2	1,2
Physical activity level	Sedentary	58	33,9
	Insufficiently active	42	24,6
	Active	24	14,0
	Very active	47	27,5

Source: Authors

Table 2 presents the distribution of absolute and relative frequencies for CDs, and the five diseases with the greatest distribution were hypertension (57.9%), high cholesterol (31.6%), diabetes (31%), osteoarthritis (21.6%), and depression (16.4%).

Table 2. Distribution of absolute and relative frequencies (%) related to chronic diseases (n = 171, Rio Claro -SP, 2018)

Variables	Manual work (n / %)	Intellectual work (n / %)	p
Hypertension			0,017
No	31 (43,1)	41 (56,9)	
Yes	62 (62,6)	37 (37,4)	
High cholesterol			0,709
No	62 (53)	55 (47)	
Yes	31 (57,4)	23 (42,6)	
Diabetes			0,660
No	66 (55,9)	52 (44,1)	
Yes	27 (50,9)	26 (49,1)	
Hyperthyroidism			0,684
No	84 (53,3)	68 (44,7)	
Yes	9 (47,4)	10 (52,6)	
Arrhythmia			0,178
No	83 (56,8)	63 (43,2)	
Yes	10 (40)	15 (60)	
Infarction			0,786
No	89 (54,9)	73 (45,1)	
Yes	4(44,4)	5 (55,6)	
Angina			0,302
No	88 (53,3)	77 (46,7)	
Yes	5 (83,3)	1 (16,7)	
Osteoporosis			1,000
No	89 (54,6)	74 (45,4)	
Yes	4 (50)	4 (50)	
Osteoarthritis			0,017
No	66 (49,3)	68 (50,7)	
Yes	27 (73)	10 (27)	
Scoliosis			0,141
No	92 (55,8)	73 (44,2)	
Yes	1 (16,7)	5 (83,3)	
Herniated disc			1,000
No	89 (54,6)	74 (45,4)	
Yes	4 (50)	4 (50)	
Low back pain			0,524
No	91 (55,2)	74 (44,8)	
Yes	2 (33,3)	4 (66,7)	
Depression			1,000
No	78 (54,4)	65 (45,5)	
Yes	15 (53,6)	13 (46,4)	

Note: Association of type of lifelong work (manual or intellectual) and disease, $P < 0,05$

Source: Authors

Figure 1 presents the associations between the type of work performed throughout life and factors related to health (PI, BMI, diseases, and expenditures on health services). Significant associations were observed for the diseases hypertension (p-value = 0.01) and osteoarthritis (p-value = 0.01) among those who performed manual work throughout life. For the other variables (PI, BMI, medication use, and medical consultations), no significant associations were observed (p-value \Rightarrow 0.05).

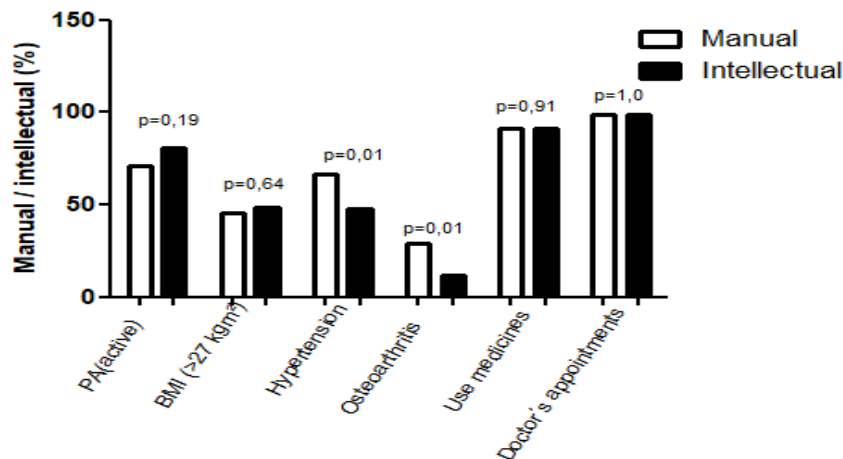


Figure 1. Association of the type of work performed during life (manual or intellectual) and physical inactivity, body mass index, illnesses and health services expenses (n = 171, Rio Claro -SP, 2018)

Source: Authors

Table 3 shows the comparison between work performed throughout life and spending on health services. It can be observed that the variables present similar behavior, with no significant differences indicated. Although no significant differences are presented, higher expenses can be observed for those who performed manual labor.

Table 3. Comparison of work performed throughout life (manual or intellectual) and expenditures on health services (n=171, Rio Claro -SP, 2018)

Expenses	Manual Work (n=93)	Intellectual Work (n=78)	P
	R\$ (IQR)	R\$ (IQR)	
Consultations	20 (40)	20 (20)	0.94
Medications	2 764.00 (6 989.00)	2 369.00 (5 382.00)	0.07
Exams	127.54 (152.84)	119.25 (151.42)	0.71
Hospitalizations	0.00 (0.00)	0.00 (0.00)	0.31
Total	3 080.09 (6 785.21)	2 452.71 (6 785.21)	0.07

Note: R\$=value in Reais; IQR= interquartile Range. P<0,05

Source: Authors

Discussion

The objective of this study was to identify the most prevalent CDs in retired residents in the city of Rio Claro-SP and possible associations with the type of work performed throughout life (manual or intellectual) with PI, BMI, diseases, and expenditures on health services.

Lifelong manual work has been associated with diseases such as hypertension and musculoskeletal diseases (osteoarthritis). The results corroborate other population studies which demonstrated that those with low schooling usually perform work with greater exposure to physical factors that may contribute to load-induced injury, such as heavy, monotonous,

repetitive work, non-ergonomic movement patterns, and noise²⁰. The reduced work capacity related to the disease seems to be associated with the nature of the work that the person develops throughout their life, directly interfering in the socioeconomic differences that exist between the groups (manual or intellectual)²¹

The out a follow-up study between the years 2000 and 2009 with workers between 30 and 62 years of age. In this study, the authors sought to identify self-assessment of health, diseases, and socioeconomic differences in different working conditions, demonstrating a higher risk of disability retirement, mainly due to musculoskeletal diseases among manual workers (HR 2.44, CI 1.64-3.63 for men and HR 2.33 and IC 1.57-3.44 for women) when compared to workers with a higher education level²².

A study that corroborates our findings was carried out by Parker and collaborators who followed workers for more than 20 years, with the objective of investigating socioeconomic status, working conditions, and effects on health conditions. However, life-long working conditions seem to have an association between socioeconomic status and post-retirement health status²³. Thus, the implementation of specific health actions directed to the work environment, could be an alternative for the prevention of diseases at advanced ages and the early withdrawal of the individual from work activities²⁴.

The number of people with musculoskeletal diseases and functional physical impairment has increased due to a higher proportion of older workers²⁵. In 2015, the world population estimates showed that there were seven people of active age (20 to 64 years) for each individual aged 65 or over; 2050 projections indicate that this ratio will fall by half.

This study points out that working beyond retirement age is more difficult for workers with a CD, emphasizing that working and health conditions independently predict between groups of workers who have or do not have a CD, and that demographic and socioeconomic characteristics do not contribute independently to this prediction²⁶.

Furthermore, according to the National Health Survey²⁷, approximately 30% of Brazilians 60 years of age or older present some difficulty in performing at least 1 of 10 activities of daily living. However, the influence of the work environment on health is explicit and could grow in future generations with the growth in total work time (19), due to the changes in contribution time and minimum age for the worker to retire proposed by the pension reform, and workers will therefore be active for a longer period²⁸.

Another factor that should be considered is that if the individual has a good capacity for work, this contributes to older individuals (of retirement age) continuing to work²⁹; the ability to work requires a balance between personal conditions (age, health, skills, values, and attitudes) and working conditions (environment, demands, and work organization). Chronological aging compromises the ability to work³⁰. Authors point out that the first functional decline occurs at around age 45, followed by the second decline at age 55. Health, functional capacity, and the characteristics of the work itself appear to be the factors that most affect the ability to work among people of all ages³¹.

Therefore, the risk factors related to CDs associated with the type of work performed (hypertension and arthritis/arthrosis) in the present study may be modifiable and should be prevented and/or minimized through interventions such as counseling, guided physical activity. Thus, investing in measures that promote better working conditions (more ergonomic), to create conditions that are similar to those whose occupational activities have a low incidence of diseases associated with the nature of the work, is of extreme importance so that in the future these investments can have positive effects on spending and savings on health services, and also so that people can remain active for longer in their work activities.

Conclusion

It is concluded that manual work seems to present a higher risk for the development of CDs (hypertension and osteoarthritis), which may represent early retirement of the worker and greater public expenses with health care and services. It is the responsibility of public and private agencies to invest more in better working conditions and ergonomics during the work period, in order to avoid future diseases and aggravations.

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Authors' ORCID:Pollyanna Natalia Micali: <https://orcid.org/0000-0003-3294-9045>Jamile Sanches Codogno: <https://orcid.org/0000-0003-9375>

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Author address: Pollyanna Natalia Micali . Avenida 24-A, Bela Vista, 2525. Rio Claro-SP. E-mail: micalipolly@gmail.com