

Pain prevalence on public servants: association with sedentary behavior and physical leisure activity

Prevalência de dor em servidores públicos: associação com comportamento sedentário e atividade física de lazer

José Jean de Oliveira Toscano¹, Anna Cecilya Gomes Zefferino¹, Jamerson Bruno Cordeiro Felix¹, Cyro Rego Cabral Júnior¹, Diego Augusto Santos Silva²

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ABSTRACT

BACKGROUND AND OBJECTIVES: From usual actions which reflect lifestyle of those working on administrative functions, there is the sedentary behavior. This study aimed at associating prevalence of pain to sedentary behavior and physical activity level of public servants.

METHODS: Sample was made up of 156 public servants of both genders, mean age of 39.8±12.3 years, working for a federal university of the Northeastern region of Brazil, who have answered a questionnaire with variables related to pain, sedentary behavior and practice of physical activity. For descriptive analysis data were expressed in mean, standard deviation, absolute and relative frequency. Regression analysis was used to estimate prevalence ratios and confidence interval of 95%. For adjusted analysis, all variables were included in the model, considering $p \leq 0.05$ significantly associated to the outcome.

RESULTS: The prevalence of sedentary behavior watching TV was 24.4% and at work it was 88.5%. Approximately 65% of the sample were poorly physically active. Pain was reported by 76.3% of the sample. After adjusting for gender, age and physical activity, those spending more than two hours a day sitting watching TV and remaining sitting at work were subgroups with highest possibilities of having pain ($p < 0.05$).

CONCLUSION: Approximately eight out of ten employees have reported musculoskeletal pain. From investigated behaviors, it was observed that servants spending a lot of time sitting had higher probability of reporting pain.

Keywords: Adults, Employees, Musculoskeletal pain, Physical activity, Sedentary behavior.

RESUMO

JUSTIFICATIVA E OBJETIVOS: Das ações habituais que refletem o estilo de vida dos que exercem função laboral administrativa, destaca-se o comportamento sedentário. O objetivo deste estudo foi associar a prevalência de dor com o comportamento sedentário e nível de atividade física de servidores públicos.

MÉTODOS: A amostra foi constituída por 156 servidores públicos, de ambos os gêneros, média de idade de 39,8±12,3 anos, lotados em uma universidade federal do Nordeste do Brasil, que responderam a um questionário com variáveis relativas a dor, comportamento sedentário e prática de atividade física. Para análise descritiva foram expressos valores de média, desvio padrão, frequência absoluta e relativa. Empregou-se a análise de regressão para estimativas de razões de prevalências e intervalos de confiança de 95%. Na análise ajustada, todas as variáveis foram incluídas no modelo. Considerou-se significativamente associado ao desfecho um valor de $p \leq 0,05$.

RESULTADOS: A prevalência de comportamento sedentário vendo TV foi de 24,4% e no trabalho foi de 88,5%. Aproximadamente 65% da amostra eram insuficientemente ativos fisicamente. A presença de dor foi reportada por 76,3% da amostra. Após ajuste pelo gênero, idade e atividade física, aqueles que passavam mais de duas horas por dia sentados à frente da TV e ficavam sentados no trabalho foram os subgrupos com maiores probabilidades de presença de dor ($p < 0,05$).

CONCLUSÃO: Aproximadamente 8 em 10 trabalhadores reportaram dor musculoesquelética. Dos comportamentos investigados foi verificado que servidores que passavam muito tempo sentados tinham maiores probabilidades de reportar dor.

Descritores: Adultos, Atividade física, Comportamento sedentário, Dor musculoesquelética, Trabalhador.

INTRODUCTION

Either chronic or acute, pain is a public health problem due to its high prevalence, high costs and negative impact on functional aspects¹. Pain affects physical activities, sleep, sexual life, mood and self-esteem and leads to negative thoughts. It also changes family relationships and is among major causes of absenteeism at work².

Workers are the most affected population by acute or chronic pain and for this reason pain-related studies should be carried out aiming at reinforcing available

1. Universidade Federal de Alagoas, Maceió, AL, Brasil.
2. Universidade Federal de Santa Catarina, Florianópolis, SC, Brasil.

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Correspondence to:

Av. Lourival Melo Mota, s/n - Tabuleiro dos Martins
57072-900 Maceió, AL, Brasil.
E-mail: jean.toscano@hotmail.com

results and enhancing evidences about the relationship between factors possibly determining such outcome³. In this sense, from the set of routine actions which reflect the lifestyle of contemporary adults, especially those in administrative functions, there is the sedentary behavior, due to the high number of hours sitting to which such workers are submitted.

Decreased physical activity levels and increased time sitting have led to a complex set of relationships between daily energy expenditure and health⁴. Physiologic processes resulting from lack of muscle contraction may cause negative effects on major cell and molecule mechanisms, including the negative relationship of inactivity of lower limb muscles and posture maintenance⁵.

Physical inactivity and sedentary behavior are different concepts. Individuals are physically inactive when they do not meet current physical activity recommendations⁶. Sedentary behavior, on the other hand, is expressed by the proportion of daily time spent in activities with intensity below 1.5 MET, especially time sitting⁷.

Health professionals, when identifying existing pattern in the investigated environment, may propose more effective actions for pain control.

So, the primary objective of this study was to estimate pain prevalence and to evaluate the association between this outcome with enough practice of leisure physical activity and prolonged sedentary behavior time among public servants of a city from the Northeastern of Brazil.

METHODS

This is a cross-sectional study. Target population was made up of public servants of the Universidade Federal de Alagoas - UFAL, Maceió-AL campus, Northeastern of Brazil. Studied population was made up of servants working at institution's rectory building, in a total of 310 individuals. To characterize the sample, it was determined by convenience that 50% of servants should participate in the study, being selected by simple randomized sampling. A drawing was performed in each sector considering the number of servants in that place. Each sector was previously visited to schedule time to collect relevant variables. There were seven refusals in four sectors, being replaced by servants of the same sector. At the end, participated in the study 156 servants of both genders with mean age of 39.8±12.3 years. Outcome variable was chronic pain, being characterized as verbal report of pain for more than six months in a same site, using a dichotomous item (yes or no)⁸. A body map was used to locate pain, where participants were asked to indicate painful regions. Pain intensity was evaluated by means of a numeric scale graded from zero to 10, where zero means no pain and 10 means the worst imaginable pain, being classified as follows: 1-4 (mild pain); 5-7 (moderate pain); 8-10 (severe pain)^{9,10}.

With regard to sedentary behaviors, two indicators were used: time sitting watching TV and time sitting at work; in

general these are behaviors occupying most time of people and have better measurements in terms of validity and reproducibility¹¹. Time watching TV was dichotomized in low (≤ 2 h) and high (> 2 h)². At work, answers were classified in time sitting: low (≤ 3.5 h), moderate (3.6 to 5.5h) and high (≥ 5.6 h)¹³.

The leisure physical activity section of the international physical activity questionnaire (IPAQ) long form was used to identify the practice of physical activity. This component was divided into complying or not with the recommendation of 150 minutes per week of physical activity, based on IPAQ questions on hiking and practicing of moderate or intense physical activity¹⁴.

Form with relevant variables was self-applied. Data were collected by two evaluators in November and December 2014. During tool application, one evaluator would be around to solve any type of question during form filling. Participants have signed the Free and Informed Consent Term (FICT).

Statistical analysis

Data were tabulated and analyzed by the SPSS version 21 spreadsheet. Descriptive statistics with mean and standard deviation was used for age, and absolute and relative frequency was used for remaining variables. Poisson regression analysis with robust variance adjustment, raw and adjusted, was used to estimate prevalence ratios and 95% confidence interval. In the adjusted analysis, all variables were included in the model, regardless of raw analysis p value. Interaction terms were verified among all predictors, however no interaction was found among variables. A value of $p \leq 0.05$ was considered significantly associated to the outcome.

This study was approved by UFAL Ethics Committee under registry 37817114.1.0000.5013.

RESULTS

Mean age of 156 investigated servants was 39.8±12.3 years. Most servants were females (60.3). The prevalence of sedentary behavior watching TV was 24.4% (> 2 h/day) and of sedentary behavior at work was 88.5% (> 3.5 h/day). Approximately 65% of the sample were insufficiently physically active. Pain was present in 76.3% (Table 1).

Among servants reporting pain ($n=119$) (Table 2) most had excessive sedentary behavior at work and with regard to watching TV per day ($p=0.038$) ($p=0.034$). Back pain was reported by 63.0% of those reporting pain ($p=0.010$). Raw analysis of the association between pain and independent variables has found that those spending more than two hours per day watching TV had higher probability of reporting presence of the outcome. Servants reporting sitting for more than 3.5h per day at work had higher probability of reporting pain. After adjusting by gender, age and practice of physical activity, those spending more than two hours per day watching TV (PR: 1.2; CI95%: 1.1-1.3)

Table 1. Investigated sample characteristics

Variables	n	% (CI95%)
Gender		
Female	94	60.3 (32.2-47.7)
Male	62	39.7 (52.2-67.7)
Age (mean±SD)	156	39.8 (12.3)
Time sitting (TV)		
≤2h/day	118	75.6 (68.2-81.7)
>2h/day	38	24.4 (18.2-31.7)
Time sitting (Work)		
≤3.5h/day	18	11.5 (7.3-17.6)
3.6 to 5.5h/day	34	21.8 (15.9-29.0)
≥5.6h/day	104	66.7 (58.8-73.6)
Physical activity		
Physically active	55	35.3 (28.0-43.2)
Physically inactive	101	64.7 (56.8-71.9)
Pain		
No	37	23.7 (17.6-31.1)
Yes	119	76.3 (68.8-82.3)

CI = confidence interval; SD = standard deviation.

Table 2. Profile of people reporting pain

Variables	Pain presence		
	n	% (CI95%)	p value
Gender			
Female	72	76.6 (63.2-85.0)	0.910
Male	47	75.8 (66.8-84.1)	
Age (mean±SD)	119	40.1 (12.2)	
Time sitting (TV)			
≤2h/day	86	72.9 (64.0-80.2)	0.038*
>2h/day	33	86.8 (71.1-94.6)	
Time sitting (work)			
≤3.5h/day	11	61.1 (35.4-81.7)	0.034*
3.6 to 5.5h/day	31	91.2 (74.7-97.2)	
≥5.6h/day	77	74.0 (64.6-81.6)	
Physical activity			
Physically active	41	74.5 (61.0-84.5)	0.707
Physically inactive	78	77.2 (67.8-84.4)	
Back Pain			
No	44	37.0 (28.6-46.1)	0.010*
Yes	75	63.0 (53.8-71.3)	
Pain intensity			
Mild	32	26.9 (19.6-35.6)	0.153
Moderate	49	41.2 (32.5-50.3)	
Severe	38	31.9 (24.0-40.9)	

CI = confidence interval; SD = standard deviation; *p-value ≤0.05 (Chi-square test to compare proportions).

and those remaining sitting at work (3.6 to 5.5h/day, PR: 1.2; CI95%: 1.1-1.4; ≥5.6h/day, PR: 1.3; CI95%: 1.1-1.6) were the subgroups with highest probabilities of reporting pain (Table 3).

Table 3. Poisson regression analysis with prevalence ratio estimates and 95% confidence interval of the association between pain and independent variables.

Variables	Raw analysis		Adjusted analysis§	
	PR (CI95%)	p-value	PR (CI95%)	p value
Time sitting (TV)				
≤2h/day	1.0	0.039*	1.0	0.021*
>2h/day	1.2 (1.1-1.2)		1.2 (1.1-1.3)	
Time sitting (Work)				
≤3.5h/day	1.0	0.007*	1.0	0.005*
3.6 to 5.5h/day	1.2 (1.1-1.5)		1.2 (1.1-1.4)	
≥5.6h/day	1.1 (0.9-1.2)		1.3 (1.1-1.6)	
Physical activity				
Physically active	1.0	0.710	1.0	0.891
Physically inactive	1.0 (0.9-1.1)		1.1 (0.9-1.2)	

PR = prevalence ratio; CI = confidence interval; *p-value <0.05; §Adjusted analysis for all variables, regardless of raw analysis p value.

DISCUSSION

Considering that one major reason for public servants medical leave, both in Brazil and in developed countries such as England and Sweden, are musculoskeletal system and connective tissue diseases¹⁵⁻¹⁷ It is necessary for public institutions to verify health conditions of their employees. A prevalence of 76.3% of chronic pain was found among investigated servants in this study. In a study with 505 servants of the Universidade Estadual de Londrina⁸, with majority also of females, an also high prevalence of 61.4% of chronic pain was found.

When identifying determining factors in a population-based study in Brazil, the number of subjects exposed to sedentary behavior in the five investigated domains has shown that time watching TV and time sitting at work were among the three more prevalent behaviors¹⁸. Static positions maintained for long periods and frequent use of computers are factors commonly associated to muscle tension, discomfort, fatigue and musculoskeletal pain, which may evolve to decreased functional capacity and disability¹⁹. In our study, sedentary behavior observed by means of variables watching TV and time sitting at work was significant among those reporting pain.

Overuse of chair may lead to fatigue and overload of passive joint elements, causing desensitization of tissue mechanoreceptors and consequent decrease or elimination of deep stabilizing strength, increasing the probability of musculoskeletal changes²⁰. In a systematic review on the efficacy of ergonomic adjustments in chairs in the working place to decrease musculoskeletal symptoms, authors have con-

cluded that amount, level and quality of evidences are just moderate and that recommendations could not be made in this sense²¹. It seems that sitting for long times is the major determining factor to be fought, considering that muscles helping posture maintenance suffer metabolic and neural interference when muscle contraction is decreased²².

Body region with significant prevalence of pain in the investigated population was the spine (63%). Literature has reported that back pain is more frequent in workers spending long times in the sitting position²³. Possible justification for this situation is that the sitting position may decrease joint mobility, in addition to fatiguing spinal extensor muscles, impairing spinal stability and alignment. Such biomechanical disorders are considered important etiologic factors for the development of acute and chronic back pain²⁴. Adequate fitness levels (muscle flexibility and strength/resistance) may contribute to body posture during labor activities with energy sparing and without exceeding tolerable muscle-tissue limits, and may be a protective factor against back pain²⁵.

With regard to pain intensity, a study with 74 patients of the Teaching Hospital, Universidade Federal do Maranhão, Brazil, has observed that most patients, especially the group of workers, have reported moderate pain (52.6%), being that labor activity would increase pain intensity²⁶. Among servants of our study, although a higher prevalence of moderate pain, there has been no significant difference as compared to other pain intensities. Anyway, regardless of intensity reported by employees, such pain should be prevented.

Our study has not found significant associations between leisure physical activity and pain among investigated servants. A study carried out in a university, with sample with characteristics similar to our study, has also not found association between physical activity level and presence or musculoskeletal pain²⁷. A possible justification for this lack of association could have been the investigated physical activity domain (leisure) which may not be the most effective way to capture relationships with pain among employees spending long times sitting. This is reinforced because there are evidences that physical exercise programs in the workplace decrease the presence of musculoskeletal pain among employees²⁸. So, if our study had investigated the domain of physical activity at work, results could have been different. Physical activity leads to muscle contraction which causes beneficial circular and metabolic adaptations of skeletal muscles and connective tissues, contributing for better static and dynamic posture, decreasing the risk of musculoskeletal and metabolic injuries and disabilities²⁹⁻³¹.

Our results confirm the literature, that is, even among people practicing moderate to intense physical activity during leisure, long time in the sitting position may promote noxious effects to health, such as the presence of pain. This suggests that such behavior, per se, is just a potential risk factor for people's health, with the need to evaluate both sedentary and physical activity behaviors^{32,33}.

CONCLUSION

From investigated behaviors, it was observed that servants spending long times sitting (at home and at work) had higher probability of reporting pain. Strategies to decrease time sitting, both at work and at home, should be developed to try to decrease the prevalence of pain. New investigations about the causal role of sedentary behavior on health, especially musculoskeletal pain, are, then, necessary.

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