Musculoskeletal Pain in Elderly in a City in Southern Brazil: Prevalence and associated factors

Dores Osteomusculares em Idosos de um Município do Sul do Brasil: Prevalência e fatores associados

Dolor musculoesquelético en el anciano de un municipio del sur de Brasil: Prevalencia y factores asociados

Bruna Duarte Nunes de Oliveira
ORCID: https://orcid.org/0000-0002-5292-7508
Universidade Federal de Pelotas, Brazil
E-mail: bduartenunes@gmail.com
Mirelle de Oliveira Saes
ORCID: https://orcid.org/0000-0001-7225-1552
Universidade Federal do Rio Grande, Brazil
E-mail: mirelleosaes@gmail.com
Karla Pereira Machado
ORCID: https://orcid.org/0000-0003-1765-1435
Universidade Federal de Pelotas, Brazil
E-mail: karlamachadok@gmail.com
Elaine Thumé
ORCID: https://orcid.org/0000-0002-1169-8884
Universidade Federal de Pelotas, Brazil
E-mail: elainethume@gmail.com
Alitéia Santiago Dilélio
ORCID: https://orcid.org/0000-0001-6718-2038
Universidade Federal de Pelotas, Brazil
E-mail: aliteia@gmail.com

Abstract
Musculoskeletal pain in the elderly affects functional capacity and influences increased frailty, comorbidities and mortality. The aim of the study was to evaluate the prevalence of musculoskeletal pain and associated factors in the elderly population. This is a cross-sectional study, using data from the Elderly Cohort Project in Bagé-RS: health situation and relationship with the Family Health Strategy (FHS), carried out during the 2016/2017 follow-up. The sample consisted of 735 elderly people, aged 68 or over, residing in the area covered by primary health care services in the urban area of the municipality of Bagé / RS. The Nordic Musculoskeletal Questionnaire (NMQ) was used to analyze prevalence of pain in the upper limbs, spine and lower limbs and to verify associated factors. Information on the symptoms in these regions of the body was used. The majority elderly of whom were female (65.4%) aged between 68 and 79 years (68.7%) and white skin color (82.2%). Prevalence of musculoskeletal pain in the spine was 42.5%, 33.7% in the upper limbs and 31.0% in the lower limbs. In the crude and adjusted analysis association of pain was maintained with the presence of multimorbidity, greater satisfaction with health and use of emergency services in the last year. The results of this study reinforcing the pattern of pain and musculoskeletal symptoms in the elderly and justifying the need for training professionals and health services to serve this growing portion of the population.
Keywords: Elderly; Musculoskeletal pain; Pain; Primary health care.

Resumo
A dor osteomuscular nos idosos afeta a capacidade funcional e influência o incremento da fragilidade, das comorbidades e da mortalidade. O objetivo do estudo foi avaliar a prevalência de dor osteomuscular e os fatores associados na população idosa. Trata-se de um estudo transversal, com dados oriundos do Projeto Coorte de idosos de Bagé-RS: situação de saúde e relação com a Estratégia de Saúde da Família (ESF), realizado no acompanhamento de 2016/2017. A amostra foi constituída por 735 idosos, com 68 anos ou mais de idade, residentes na área de abrangência dos serviços de atenção básica à saúde da zona urbana do município de Bagé/RS. O Questionário Nórdico de Sintomas Osteomusculares (QNSO) foi utilizado para analisar a prevalência de dor nos membros superiores, na coluna e nos membros inferiores. Para verificar os fatores associados foram utilizadas as informações sobre a sintomatologia nessas regiões do corpo. A maioria dos idosos eram do sexo feminino (65,4%) com idade entre 68 e 79 anos (68,7) e com cor da pele branca (82,2%). A prevalência de dor osteomuscular na coluna foi de 42,5%, de

33,7% nos membros superiores e 31,0% nos membros inferiores. Na análise bruta e ajustada manteve-se a associação da dor com a presença de multimorbidade, maior satisfação com a saúde e utilização de serviço de emergência no último ano. Os resultados deste estudo reforçam o padrão de dor e sintomas osteomusculares em idosos e justifica a necessidade de capacitação dos profissionais e serviços de saúde para atender esta crescente parcela da população.
Palavras-chave: Idoso; Dor musculoesquelética; Dor; Atenção primária à saúde.

Resumen
El dolor musculoesquelético en el anciano afecta la capacidad funcional e influye en el aumento de la fragilidad, las comorbilidades y la mortalidad. El objetivo del estudio fue evaluar la prevalencia de dolor musculoesquelético y factores asociados en la población anciana. Se trata de un estudio transversal, con datos del Proyecto Cohorte de Ancianos en Bagé-RS: situación de salud y relación con la Estrategia Salud de la Familia (ESF), realizado en el seguimiento 2016/2017. La muestra estuvo conformada por 735 personas mayores de 68 años o más, residentes en el área atendida por los servicios de atención primaria de salud en el área urbana del municipio de Bagé / RS. Se utilizó el cuestionario nórdico musculoesquelético (QNSO) para analizar la prevalencia del dolor en miembros superiores, columna y miembros inferiores. Para verificar los factores asociados, se utilizó información sobre los síntomas en estas regiones del cuerpo. La mayoría de los ancianos eran mujeres (65,4%) con edades comprendidas entre 68 y 79 años (68,7) y de color de piel blanca (82,2%). La prevalencia de dolor musculoesquelético en la columna fue 42,5%, 33,7% en miembros superiores y 31,0% en miembros inferiores. En el análisis crudo y ajustado se mantuvo la asociación del dolor con la presencia de multimorbilidad, mayor satisfacción con la salud y uso de los servicios de urgencias en el último año. Los resultados de este estudio refuerzan el patrón de dolor y síntomas musculoesqueléticos en los ancianos y justifican la necesidad de capacitar a los profesionales y los servicios de salud para atender a esta creciente porción de la población.
Palabras clave: Anciano; Dolor musculoesquelético; Dolor; Atención primaria de salud.

1. Introduction

Pain is conceptualized as a bad sensory and emotional experience, a symptom of an underlying disease with tissue damage, or a primary condition, where there is emotional and functional impairment without previous disease (Treede et al., 2019). In turn, musculoskeletal pain affects functionality and is a source of stress, prolonged suffering and drug abuse, becoming a problem for the individual, his/her family and the health system (Andrade, F. A., Pereira, L. V. & Sousa, 2006).

In the elderly, musculoskeletal pain is even more impacting, affecting functional capacity, which can lead to high levels of fragility, comorbidities and mortality (Gold & Roberto, 2000). In addition, pain is among the main symptoms that reduce the likelihood of the elderly maintaining their daily activities, reduces interactionwith other people, and increases social isolation (Celich & Galon, 2009).

One study reports higher prevalence of pain in the lumbar regions (25.4%), in the lower limbs (21.9%), in the upper limbs (13.0%) and the dorsal region (10.7%) (Carvalho & Souza, 2017; Dellaroza et al., 2013). Another study relating to prevalence of chronic pain due to anatomical structures, found that it was predominant in the lumbar spine (40.0%), followed by the patellofemoral joints (15.0%), cervical spine (13.3%), upper limbs (8, 4%), lower limbs region and hip joint (6.6%) (Carvalho & Souza, 2017; Dellaroza et al., 2013).

As for factors associated with musculoskeletal pain, there are those considered intrinsic: female gender, advanced age, white skin color, hormonal deficiency, presence of comorbidities, genetic factors, fragility or history of previous fracture, weakness of lower limbs, deficit of balance and polypharmacy; and those considered extrinsic: low body weight, physical inactivity, time of exposure to tobacco, alcohol abuse (Bello et al., 2014; Curtis et al., 2015).

Considering the magnitude of the problem and the impact on the quality of life of the elderly, it is essential that studies on the subject are published, in order to guarantee that researchers and professionals who study the subject and work caring for the elderly population, especially in the elderly. can update their knowledge regarding preventive and rehabilitation care (Miranda et al., 2012; Mody & Brooks, 2012).

In this sense, the objective of the present study was to evaluate the prevalence of musculoskeletal pain and associated factors in the elderly population living in the urban area in Southern the an Brazilian..

2. Methodology

This is a descriptive and analytical study, with a cross-sectional analysis, (Bonita, R., Beaglehole, R., & Kjellström, T, 2010; Pereira, A. S., Shitsuka, D. M., Parreira. F. J., & Shitsuka, R, 2018) with data from the Bagé-RS Elderly Cohort Project: health situation and relationship with the Family Health Strategy (FHS) - (SIGa- Bagé). The sample consisted of elderly people, aged 68 or over, residing in the area covered by primary health care services in the urban area of the municipality of Bagé / RS.

The municipality of Bagé is located in the southern part of the state of Rio Grande do Sul (RS), on the border with Uruguay, with a territorial area of 4.093.582 km and a demographic density of 28.52 inhabitants / km². In 2008, 12.0% of the population of Bagé were elderly people aged 60 or over, with a total of 14.1% estimated for 2020 (IBGE, 2020).

Data were collected for the first time in 2008 and the initial sample was selected by systematic searching in the coverage areas of the municipality's 20 Primary Healthcare Centers (PHCs) (15 followed the FHS model and 5 followed the Traditional model). All individuals 60 years of age or older, residing in the selected households, were considered eligible and invited to participate in the research. Among the 1.713 elderly selected, 1,593 were interviewed, with 852 resident in the FHS coverage areas and 741 resident in the Traditional PHC coverage areas (Thumé et al., 2011). Between August 2016 and September 2017, using the list with the names and addresses of the elderly people sampled in 2008, all participants were contacted and invited to participate again in the study, thus constituting the cohort called Saúde do Idoso Gaúcho de Bagé (SIGa-Bagé). This study used the data collected in 2016/2017.

The interview was conducted at the elderly people's homes, by trained and qualified interviewers, by filling out a structured questionnaire with pre-coded questions, standardized and previously tested, using an electronic device - Personal Development Analysis (PDA). Elderly people who, during the data collection period, were identified as dying, no longer lived in the same city, lived in Long Term Care Institutions or were prevented from responding by court order were excluded.

To analyze prevalence of pain in the upper limbs, spine and lower limbs and associated factors, complete information on the symptoms in these regions of the body was used, obtained via the Nordic Musculoskeletal Questionnaire (NMQ) (Kuorinka et al., 1987) validated in Brazil in 2002, as a standard for measuring reported musculoskeletal symptoms (Maia et al., 2018).

The dependent variable was investigated by asking the following question: "*In the last 12 months have you had problems (such as pain, tingling and numbness) in: neck / cervical region, shoulders, arms, elbows, forearms, wrists / hands / fingers, region back, lumbar region, hip / lower limbs?*", with options for dichotomous responses (no / yes). To this end, the respondents were shown an illustrative figure of the human body to observe the regions of the body and answer the question. For analysis purposes, the variable was divided into pain in the upper limbs (neck / cervical region, shoulders, arms, elbows, forearms, wrists / hands / fingers), pain in the spine (dorsal region, lumbar region) and pain in the lower limbs (hip / lower limbs). Presence of pain in at least one of the body regions included in the variables "pain in the upper limbs", "pain in the spine" and "pain in the lower limbs" was considered to be an affirmative answer.

The independent variables were: sex (male, female); age (in complete years - later categorized - 68 to 79, 80 and more); self-reported skin color (white / black, yellow, brown, indigenous); marital status (with partner / married, without partner / single, widowed); education (in complete years - later categorized - none, 1 to 7, 8 or more); economic classification as per ABEP - Brazilian Association of Survey Companies-http: //www.abep.org - (A / B, C, D / E); paid work in the last month (no, yes); retired (no, yes); smoker (no, yes); alcohol consumption (no, yes); multimorbidity (none, one, two or more - considering morbidities with medical diagnosis of: systemic arterial hypertension, heart problems, lung problem, asthma, bronchitis, pulmonary emphysema, osteoporosis, arthritis or arthrosis, rheumatism, Parkinson's disease, kidney problem, prostate disease, thyroid problems, cataracts, glaucoma, Alzheimer's). Self-reported quality of life (very poor / poor, neither

poor / nor good, very good / good); satisfied with self-reported health (dissatisfied, neither satisfied / nor dissatisfied, satisfied), use of emergency services in the last year (no, yes); use of a Primary Healthcare Center (PHC) in the last year (no, yes); use of a private health service in the last year (no, yes - considering a private practice or health insurance plan); Activities of Daily Living (ADLs) (with difficulty, without difficulty)(Katz et al., 1963); Instrumental Activities of Daily Living (IADLs) (with difficulty, without difficulty) (Lawton & Brody, 1969), 1969; upper limb pain (no, yes); spinal pain (no, yes); lower limbs pain (no, yes), with changes of variables and new groupings being performed when necessary. A five-level hierarchical model was used for the adjusted analysis.

The first level consisted of demographic variables (gender; age; skin color); socioeconomic (marital status; education, economic class - ABEP, work / retirement); the second level contained behavioral variables (level of physical activity, smoking, alcoholism); the third level contained health perception and health situation (morbidities) variables; the fourth level contained ADL and IADL variables; the fifth level contained the variables regarding use of health services in the last year (emergency room, primary healthcare center, private service).

Was used to analyze the data the Stata® version 14.0 (StataCorp / College Station, United States). A significance level below 5% was adopted for two-tailed tests. Their respective confidence intervals (95% CI) were used to calculate crude and adjusted Prevalence Ratios, and the p-values of the Wald test for heterogeneity and linear trend were measured. Backward adjustment by hierarchical levels was used, keeping only those with $p \leq 0.20$ in the model, through Poisson regression with robust adjustment of variance.

The protocol for this study was approved by the Health Research Ethics Committee at the Federal University of Pelotas under protocol no. 678.664. The ethical principles established by the National Health Council were followed in accordance with its Resolution No. 466/12. Study participants were informed of their right to refuse participation and about confidentiality procedures. Those who agreed to participate in the study signed an Informed Consent Form.

3. Results and Discussion

The 1,036 elderly people were located, of these 81 were refusals (5.1%) and 220 losses (13.8%) (including losses in data transfer, not located, institutionalized and those who moved to another municipality), totaling 735 elderly people interviewed.

Table 1. Description of the sample and prevalence of musculoskeletal disorders according to sociodemographic, work, behavioral, health, health service use, Katz and Lawton characteristics and elderly symptoms. Bagé-RS, 2016-2017 (N = 735).

Variable	Sample total	Prevalence of pain in the upper limbs (n= 242; 33.7%)	Prevalence of back pain (n= 305; 42.5%)	Prevalence of pain in the lower limbs (n= 222, 31.0%)
	n (%)	n (%)	n (%)	n (%)
Sex		0.001*	0.096*	0.107*
Male	254 (34.6)	64 (25.7)	95 (38.2)	67 (27.0)
Female	481 (65.4)	178 (38.0)	210 (44.9)	155 (33.1)
Age		0.145*	0.743*	0.065*
68-79 years	505 (68.7)	177 (35.5)	210 (42.1)	165 (33.1)
80 years or more	230 (31.3)	65 (29.7)	95 (43.6)	57 (26.0)
Skin color		0.079*	0.621*	0.290*
White	604 (82.2)	191 (32.3)	254 (43.0)	178 (30.1)
Black, yellow, brown, indigenous	131 (17.8)	51 (40.5)	51 (40.5)	44 (34.9)
Marital status		0.565*	0.254*	0.832*
With partner / married	310 (42.4)	107 (35.0)	128 (41.8)	98 (33.1)
No partner / single	105 (14.4)	38 (36.5)	38 (36.5)	30 (28.9)
Widower	316 (43.2)	97 (31.7)	139 (45.6)	94 (30.7)
Schooling (years) (n=729)		0.697*	0.649*	0.599*
None	169 (23.2)	59 (35.8)	71 (43.0)	55 (33.3)
1-7	398 (54.6)	131 (34.0)	171 (43.7)	122 (31.3)
8 or more	162 (22.2)	50 (31.3)	63 (38.4)	45 (28.1)
Socioeconomic classification (n=720)		0.569*	0.056*	0.215*
A/B	105 (14.6)	29 (28.4)	34 (33.7)	25 (24.5)
C	283 (39.3)	94 (33.8)	130 (46.7)	83 (30.0)
D/E	332 (46.1)	110 (33.9)	132 (40.6)	109 (33.5)
Paid work in the last month (n=734)		0.682*	0.796*	0.162*
No	667 (90.9)	218 (33.4)	278 (42.7)	207 (31.8)
Yes	67 (9.1)	24 (36.4)	27 (40.9)	15 (22.7)
Retired (n=733)		0.694*	1.000*	0.615*
No	149 (20.3)	46 (31.9)	61 (42.7)	47 (32.6)
Yes	584 (79.7)	194 (33.9)	244 (42.7)	174 (30.5)
Smoking (n=728)		0.686*	0.299*	0.890*
Non-smoker	623 (85.6)	216 (33.4)	278 (43.2)	202 (31.4)
Yes-smoker	105 (14.4)	24 (35.8)	24 (35.8)	20 (29.9)
Alcohol consumption (n=728)		1.000*	0.915*	0.360*
No	623 (85.6)	205 (33.7)	257 (42.3)	194 (31.9)
Yes	105 (14.4)	35 (33.7)	45 (43.3)	28 (27.2)
Multimorbidity (n=729)		<0.001*	0.001*	<0.001*
None	74 (10.1)	11 (15.3)	25 (34.7)	16 (22.2)
One	163 (22.4)	46 (28.6)	52 (32.3)	29 (18.1)
Two or more	492 (67.5)	183 (38.1)	227 (47.4)	177 (36.9)
Quality of life (n=685)		<0.001*	0.053*	<0.001*
Very poor / poor	19 (2.8)	9 (50.0)	10 (55.6)	10 (55.6)
Neither poor / nor good	108 (15.8)	55 (50.9)	56 (51.9)	53 (49.5)

Very good / good	558 (81.5)	170 (30.5)	227 (40.7)	150 (26.9)
Satisfied with health (n=685)		<0.001*	0.001	<0.001*
Unsatisfactory	58 (8.5)	35 (61.4)	36 (63.2)	29 (50.9)
Neither satisfied / nor dissatisfied	76 (11.1)	28 (36.8)	39 (51.3)	35 (46.7)
Pleased	551 (80.4)	170 (30.9)	218 (39.6)	149 (27.1)
Use of emergency services in the last year (n=732)		<0.001*	0.005*	<0.001*
No	454 (62.0)	107 (24.1)	170 (38.3)	115 (26.0)
Yes	278 (38.0)	133 (49.1)	133 (49.3)	107 (39.5)
Use of Primary Healthcare Center in the last year (n=732)		<0.001*	0.496*	0.009*
No	345 (48.9)	89 (26.5)	138 (41.1)	88 (26.2)
Yes	387 (50.1)	151 (39.8)	165 (43.7)	134 (35.5)
Use of private health service in the last year (n=732)		0.693*	0.546*	1.000*
No	365 (40.9)	122 (34.3)	147 (41.3)	111 (31.2)
Yes	367 (50.1)	118 (32.9)	156 (43.6)	111 (31.0)
ADL (n=728)		0.4270*	1.000*	0.537*
No difficulty	627 (86.1)	207 (33.2)	266 (42.6)	192 (30.8)
With difficulty	101 (13.9)	33 (37.5)	37 (42.5)	30 (34.5)
IADL (n=718)		<0.001*	0.042*	<0.001*
No difficulty	434 (60.4)	117 (27.0)	173 (39.9)	110 (25.4)
With difficulty	284 (39.5)	121 (45.0)	128 (47.8)	109 (40.7)

* *Fisher* test p-value.
Fonte: Authors (2020).

Most of the elderly people interviewed were female (65.4%), aged between 68 and 79 years old (68.7%), of white skin color (82.2%) and widowed (43.2%). About 24.0% said they had no schooling, 46.1% were in the D / E economic classification, 9.1% did paid work in the last month and 79.7% were retired. Of the elderly investigated, 14.4% were smokers and the same proportion consumed alcohol. Just over two thirds (67.5%) had two or more morbidities, most (81.5%) perceived their quality of life as very good / good and 80.4% were satisfied with their health (Table 1).

Regarding use of health services in the last year, 38.0% used emergency services, 50.1% reported using the PHC, and the same prevalence was found for the use of private services. About 15.0% of the elderly had difficulty with activities of daily living and 39.5% with instrumental activities of daily living (Table 1).

Regarding musculoskeletal pain, 42.5% (95% CI 38.9; 46.1) of the elderly referred back pain, 33.7% (95% CI 30.2; 37.2) pain in the upper limbs and 31.0% (95% CI 27.6; 34.4) in the lower limbs. Table 1 shows the distribution of the studied outcomes according to the independent variables.

Table 2. Crude and adjusted analysis of the variables analyzed associated with prevalence of pain in the upper limbs in the elderly population. Bagé-RS, 2016-2017.

Variable	Prevalence of pain in the upper limbs					
	Crude analysis			Adjusted analysis		
	PR	95% CI	p-value	PR	95% CI	p-value
Sex			**0.002**			**<0.001**
Male	1	-		1	-	
Female	1.48	1.16;1.88		1.63	1.26; 2.10	
Age			0.139			0.224
68-79 years	1			1	-	
80 years or more	0.84	0.66;1.06		0.86	0.67; 1.10	
Skin color			0.066			**0.047**
White	1	-		1	-	
Black, yellow, brown, indigenous	1.26	0.99; 1.60		1.28	1.00; 1.63	
Marital status			0.568			**0.049**
With partner / married	1	-		1	-	
No partner / single	1.05	0.78; 1.41		0.87	0.64; 1.18	
Widower	0.91	0.72; 1.14		0.75	0.59; 0.94	
Schooling (years) (n=729)			0.390*			0.287*
None	1	-		1	-	
1-7	0.94	0.73; 1.20		0.93	0.72; 1.20	
8 or more	0.87	0.64; 1.19		0.85	0.62; 1.16	
Socioeconomic classification (n=720)			0.582			0.727
A/B	1	-		1	-	
C	1.19	0.84; 1.69		1.16	0.79; 1.71	
D/E	1.19	0.84; 1.68		1.11	0.74; 1.68	
Paid work in the last month (n=734)			0.626			0.730
No	1	-		1	-	
Yes	1.09	0.78; 1.52		1.06	0.75; 1.50	
Retired (n=733)			0.657			0.217
No	1	-		1	-	
Yes	1.06	0.82; 1.38		1.19	0.90; 1.57	
Smoking (n=728)			0.697			0.586
No	1	-		1	-	
Yes	1.07	0.76; 1.50		1.10	0.79; 1.52	
Alcohol consumption (n=728)			0.990			0.469
No	1	-		1	-	
Yes	0.99	0.75; 1.34		1.12	0.83; 1.50	
Multimorbidity (n=729)			**<0.001***			**0.004***
None	1	-		1	-	
One	1.87	1.03; 3.40		1.69	0.94; 3.03	
Two or more	2.50	1.43; 4.35		2.04	1.18; 3.53	
Quality of life (n=685)			**<0.001**			**<0.001**
Very poor / poor	1	-		1		
Neither poor / nor good	1.02	0.62; 1.68		1.29	0.76; 2.21	
Very good / good	0.61	0.38; 0.98		0.82	0.48; 1.41	
Satisfied with health (n=685)			**<0.001**			**<0.001**
Unsatisfactory	1	-		1		

Neither satisfied / nor dissatisfied	0.60	0.42; 0.86		0.58	0.40; 0.85	
Pleased	0.50	0.40; 0.64		0.62	0.47; 0.81	
Use of emergency services in the last year (n=732)			**<0.001**			**<0.001**
No	1	-		1	-	
Yes	2.03	1.66; 2.50		1.72	1.39; 2.12	
Use of Primary Healthcare Center in the last year (n=732)			**<0.001**			**0.006**
No	1	-		1	-	
Yes	1.50	1.21; 1.87		1.38	1.10; 1.74	
Use of private health service in the last year (n=732)			0.692			0.108
No	1	-		1	-	
Yes	0.96	0.78; 1.18		1.19	1.10; 1.74	
ADL (n=728)			0.411			0.247
No difficulty	1	-		1	-	
With difficulty	1.13	0.84; 1.51		0.83	0.60; 1.14	
IADL (n=718)			**<0.001**			**<0.001**
No difficulty	1	-		1	-	
With difficulty	1.67	1.36; 2.05		1.52	1.23; 1.89	

P value of the Wald test; * P value of the linear trend test.
PR: Prevalence ratio; 95% CI: 95% confidence interval.
Fonte: Authors (2020).

Table 2 shows the crude and adjusted prevalence ratios for pain in the upper limbs. After adjustments, it was found that females have a 63.0% higher probability of pain in the upper limbs when compared to males (PR = 1.63; 95% CI 1.26; 2.10). A higher probability of this outcome was also identified among the elderly with multimorbidity - two or more diseases (PR = 2.04; 95% CI 1.18; 3.53). Use of emergency health services (PR = 1.72; 95% CI 1.39; 2.12) and PHCs (PR = 1.38; 95% CI 1.10; 1.74) in the last year showed positive association with pain in the upper limbs. It was found that elderly people with difficulty performing their instrumental activities of daily living were 52.0% more likely to have this outcome compared to those without difficulty (PR = 1.52; 95% CI 1.23; 1.89). They showed protection for the occurrence of this outcome when they were widowed (PR: 0.75; 95% CI 0.59; 0.94) and satisfied with their health (PR: 0.62; 95% CI 0.47; 0.81).

Table 3. Crude and adjusted analysis of the variables analyzed associated with prevalence of back pain in the elderly population. Bagé-RS, 2016-2017.

Variable	Prevalence of back pain					
	Crude analysis			Adjusted analysis		
	PR	95% CI	PR	95% CI	PR	95% CI
Sex			0.090			0.086
Male	1	-		1	-	
Female	1.18	0.98; 1.42			1.18	0.98; 1.43
Age			0.709			0.771
68-79 years	1	-		1	-	
80s year or more	1.04	0.86; 1.24			0.97	0.80; 1.18
Skin color			0.611			0.562
White	1	-		1	-	
Black, yellow, brown, indigenous	0.94	0.75; 1.19			0.93	0.74; 1.18
Marital status			0.271			0.374
With partner / married	1	-		1		
No partner / single	0.87	0.66; 1.16			0.83	0.61;1.12
Widower	1.09	0.91; 1.31			1.01	0.83; 1.23
Schooling (years) (n=729)			0.649			0.924
None	1	-		1	-	
1-7	1.02	0.83; 1.25			1.02	0.81; 1.27
8 or more	0.92	0.71; 1.19			0.97	0.71; 1.31
Socioeconomic classification (n=720)			0.065			0.059
A/B	1	-		1		
C	1.39	1.03; 1.88			1.38	1.02; 1.86
D/E	1.21	0.89; 1.64			1.18	0.87; 1.60
Paid work in the last month (n=734)			0.782			0.969
No	1	-		1	-	
Yes	0.96	0.71; 1.30			1.10	0.73; 1.38
Retired (n=733)			1.00			0.436
No	1	-		1	-	
Yes	1	0.81; 1.24			1.09	0.87; 1.37
Smoking (n=728)			0.272			0.388
Non-smoker	1	-		1	-	
Yes-smoker	0.83	0.60; 1.16			0.87	0.66; 1.20
Alcohol consumption (n=728)			0.859			0.404
No	1	-		1	-	
Yes	1.02	0.81; 1.30			1.11	0.87; 1.41
Multimorbidity (n=729)			**0.003**			**0.035**
None	1	-		1	-	
One	0.93	0.63; 1.37			0.87	0.59; 1.29
Two or more	1.37	0.98; 1.90			1.21	0.87; 1.69
Quality of life (n=685)			**0.036**			0.484
Very poor / poor	1	-		1	-	
Neither poor / nor good	0.93	0.59; 1.47			1.10	0.67; 1.81
Very good / good	0.73	0.48; 1.12			0.96	0.59; 1.57
Satisfied with health (n=685)			**<0.001***			**<0.001***
Unsatisfactory	1	-		1	-	

Neither satisfied / nor dissatisfied	0.81	0.61; 1.1		0.86	0.64; 1.15	
Pleased	0.63	0.50; 0.79		0.68	0.54; 0.86	
Use of emergency services in the last year (n=732)			**0.004**			**0.015**
No	1	-		1	-	
Yes	1.29	1.08; 1.52		1.24	1.04; 1.47	
Use of Primary Healthcare Center in the last year (n=732)			0.487			0.674
No	1	-		1	-	
Yes	1.06	0.90; 1.26		0.96	0.80; 1.15	
Use of private health service in the last year (n=732)			0.538			0.918
No	1	-		1	-	
Yes	1.06	0.89; 1.25		1.01	0.83; 1.23	
ADL (n=728)			0.986			0.265
No difficulty	1	-		1	-	
With difficulty	0.99	0.77; 1.30		0.84	0.62; 1.14	
IADL (n=718)			**0.038**			0.302
No difficulty	1	-		1	-	
With difficulty	1.20	1.01; 1.42		1.10	0.92; 1.31	

[#] P value of the Wald test; [*] P value of the linear trend test.
PR: Prevalence ratio; 95% CI: 95% confidence interval.
Fonte: Authors (2020).

As for the spinal pain outcome, the adjusted analysis showed that the elderly who were satisfied with their health showed a lower probability of having back pain when compared to the elderly who were dissatisfied with their health (PR = 0.68; 95% CI 0.54;0.86), and that having used the emergency service in the last year increased the probability of back pain by 24.0% (95% CI 1.04; 1.47). The other variables lost association after adjustment (Table 3).

Table 4. Crude and adjusted analysis of the variables analyzed associated with prevalence of pain in the lower limbs in the elderly population. Bagé-RS, 2016-2017.

Variable	Prevalence of pain in the lower limbs					
	Crude analysis			Adjusted analysis		
	PR	95% CI	PR	95% CI	PR	95% CI
Sex			0.102			0.099
Male	1	-		1	-	
Female	1.22	0.96; 1.56		1.23	0.96; 1.57	
Year			0.065			**0.041**
68-79 years	1	-		1	-	
80 years or more	0.79	0.61; 1.02		0.76	0.59; 0.99	
Skin color			0.280			0.348
White	1	-		1	-	
Black, yellow, brown, indigenous	1.16	0.89; 1.52		1.14	0.87; 1.50	
Marital status			0.814			0.463
With partner / married	1	-		1		
No partner / single	0.90	0.64; 1.27		0.80	0.70; 1.19	
Widower	0.96	0.76; 1.21		0.92	0.80; 1.73	
Schooling (years) (n=729)			0.596			0.891
None	1	-		1	-	
1-7 years	0.94	0.72; 1.22		0.96	0.62; 1.33	
8 years or more	0.84	0.61; 1.17		0.91	0.55; 1.15	
Socioeconomic classification (n=720)			0.082*			0.094*
A/B	1	-		1	-	
C	1.22	0.83; 1.80		1.20	0.82; 1.77	
D/E	1.37	0.94; 1.99		1.34	0.92; 1.96	
Paid work in the last month (n=734)			0.152			0.210
No	1	-		1	-	
Yes	0.72	0.45; 1.13		0.74	0.47; 1.18	
Retired (n=733)			0.612			0.741
No	1	-		1	-	
Yes	0.93	0.72; 1.22		1.05	0.79; 1.40	
Smoking (n=728)			0.801			0.573
Non-smoker	1	-		1	-	
Yes-smoker	0.95	0.65; 1.40		0.89	0.60; 1.33	
Alcohol consumption (n=728)			0.351			0.628
No	1	-		1	-	
Yes	0.85	0.61; 1.19		0.92	0.65; 1.30	
Multimorbidity (n=729)			**0.001**			**0.003**
None	1	-		1		
One	0.82	0.47; 1.41		0.82	0.49; 1.39	
Two or more	1.66	1.06; 2.60		1.45	0.95; 2.24	
Quality of life (n=685)			**<0.001**			**0.001**
Very poor / poor	1	-		1		
Neither poor / nor good	0.89	0.57; 1.41		1.02	0.60; 1.73	
Very good / good	0.48	0.31; 0.75		0.64	0.37; 1.11	
Satisfied with health (n=685)			**<0.001***			**0.010***
Unsatisfactory	1			1		

Neither satisfied / nor dissatisfied	0.92	0.65; 1.30		0.94	0.65; 1.37	
Pleased	0.53	0.40; 0.71		0.69	0.49; 0.97	
Use of emergency services in the last year (n=732)			**<0.001**			**0.018**
No	1	-		1	-	
Yes	1.52	1.23; 1.89		1.31	1.05; 1.64	
Use of Primary Healthcare Center in the last year (n=732)			**0.008**			0.146
No	1	-		1	-	
Yes	1.35	1.08; 1.70		1.21	0.94; 1.55	
Use of private health service in the last year (n=732)			0.960			0.130
No	1	-		1	-	
Yes	0.99	0.80; 1.24		1.21	0.95; 1.56	
ADL (n=728)			0.475			0.285
No difficulty	1	-		1	-	
With difficulty	1.12	0.82; 1.53		0.82	0.57; 1.18	
IADL (n=718)			**<0.001**			**0.004**
No difficulty	1	-		1	-	
With difficulty	1.60	1.29; 1.99		1.40	1.11; 1.76	

[#] P value of the Wald test; [*] P value of the linear trend test.
PR: Prevalence ratio; 95% CI: 95% confidence interval.
Fonte: Authors (2020).

Table 4 shows the results in the crude and adjusted analysis of the pain in the lower limbs outcome. Positive association was identified between this outcome and use of emergency services in the last year (PR = 1.31; 95% CI 1.05; 1.64), as well as with difficulty in performing instrumental activities of daily living (PR = 1.40; 95% CI 1.11; 1.76). Prevalence of this outcome was 24.0% lower among elderly people aged 80 or over when compared to elderly people aged 68 to 79 years (PR = 0.76; 95% CI 0.59; 0.99). Being satisfied with health also showed protection for the occurrence of pain in the lower limbs (PR = 0.69; 95% CI 0.49; 0.97).

4. Discussion

The findings indicate high prevalence of the outcomes studied. Pain in the upper limbs was associated with females, the presence of two or more diseases, difficulty in performing instrumental activities of daily living, use of emergency services and primary care. Spinal pain was associated with the use of emergency services, a result similar to lower limb pain, which was also associated with difficulty in performing instrumental activities of daily living.

The results of this study corroborate the data in the literature, which report higher occurrence of pain in the upper limbs among females (Dellaroza & Pimenta, 2012; Esquenazi et al., 2014; Melo et al., 2017). Women perform more domestic tasks and during life are exposed to ergonomic loads, mainly repetitiveness, forward head posture and working at high speed. The female gender has some anatomofunctional characteristics such as less muscle mass, less bone mass, more fragile joints and being less adapted to strenuous physical effort. These characteristics may be related to higher prevalence of pain in the upper limbs (Ferreira et al., 2011).

With regard to morbidities, elderly people with two or more morbidities were more likely to develop musculoskeletal pain in the upper limbs. As diseases affect the cardiovascular, musculoskeletal, endocrine systems, among others, presence of

pain can be twice as high among elderly people who reported two or more morbidities due to their negative impact on health. Among the most cited are hypertension, diabetes and rheumatism (Tavares & Dias, 2012; Zullig et al., 2015).

Our results revealed that difficulty in performing IADL has been shown to be associated with pain in the upper and lower limbs, corroborating with the literature we researched (Dellaroza et al., 2013; Dellaroza & Pimenta, 2012). Pain may be due to physiological changes in the aging process, pathologies and/or problems associated with this age group. According to the World Health Organization, after 70 years of age, 30% of the elderly have some chronic disease and also: among those with this type of disease, around 50% have some type of limitation or physical disability (Reis & Torres, 2011). The progression of chronological age, together with the aging process, is directly related to higher levels of functional disability, a fact described in the literature (Del Duca et al., 2009). However, the possibility of reverse causality bias must be considered, since the study design does not allow identification of whether the occurrence of exposure was prior to the outcome.

Use of emergency services in the last year was associated with the presence of pain in the spine and also in the upper limbs of the elderly studied, while seeking PHC services was shown to be associated only with pain in the upper limbs. Regardless of the possibility of reverse causality, this result reinforces the importance of the outcomes studied in terms of the demand they cause for health services. In addition, it is important to highlight the greater use of emergency services, a result that may reveal weakness in continuous monitoring by primary care of cases of elderly people with musculoskeletal pain, which leads to the worsening of their pathological condition, and the need to seek pain control via emergency services (da Silva et al., 2016; Silveira & Paskulin, 2014).

Being satisfied with health has proven to be a protective factor for back and lower limb pain, as has good quality of life for pain in the upper limbs. People with poor/very poor self-rated health are about three times more likely to have chronic spine problems (Romero et al., 2018). Self-assessment of health status is a subjective indicator of the individual's perception of their own health, expressing physical, emotional, well-being and satisfaction with their own life (Melo et al., 2017).

Regarding marital status, the results show that widowed elderly people are less likely to develop pain in the upper limbs, when compared to married and single elderly people, going against the findings of other studies, where the authors refer that the feeling of loneliness, as in widowhood, could cause anguish, vulnerability, loss of control and, consequently, worsening or perpetuation of pain. It is believed that this finding is linked to lower commitment of widowed elderly people to their partner's care activities and also to the possibility of these elderly people receiving greater family support when compared to the other elderly people in the study (80 years of age or older) who had lower probability of pain in the lower limbs, going in contrast to that found in most studies, where the elderly have high prevalence of pain in that area (dos Santos et al., 2016; Feltrin et al., 2015).

Our results also identified higher prevalence of pain in the lower limbs among the elderly over 80 years of age. It is known that there is a reduction of approximately 30% in lean mass and joint mobility among elderly people in this age group. These are factors that can lead to difficulty and pain in performing activities that require physical performance, such as walking, climbing stairs, lying down and getting out of bed, bathing, dressing and doing some physical exercise (Bortoluzzi et al., 2017).

Among the positive points of this study, we highlight the sample size, the collection of primary data and the low rate of non-response. Although the data came from a cohort study, the analyses did not assess the incidence of outcomes establishing the temporal relationship, making it impossible to verify, for example, whether the presence of morbidities precedes the appearance of muscle pain.

5. Conclusion

The analyses proposed in this study sought to broaden the discussion about the prevalence of musculoskeletal pain and its associated factors among the elderly. Despite the evidence in the literature pointing to a pattern of this profile, over the years there seems to be perpetuation of little training or scarce training of health professionals, insufficient availability of specialized services and inefficient or little explored prevention to attend this growing portion of the population. The importance of further studies on the subject is highlighted, given the difficulty in obtaining data related to clinical and epidemiological characteristics, in addition to bringing possible negative implications on the quality of life of the elderly, in order to provide greater support with regard to the demands and planning preventive services related to changing lifestyle, carrying out healthy activities and tracking diseases in asymptomatic periods.

References

Andrade, F. A., Pereira, L. V. & Sousa, F. (2006). Mensuração da dor no idoso. *Revista Latino-Am Enfermagem*, *14*(2), 271–276.

Bello, A. I., Ababio, E., Antwi-Baffoe, S., Seidu, M. A., & Adjei, D. N. (2014). Pain, range of motion and activity level as correlates of dynamic balance among elderly people with musculoskeletal disorder. *Ghana Medical Journal*, *48*(4), 214–218. https://doi.org/10.4314/gmj.v48i4.8

Bonita, R., Beaglehole, R., & Kjellström, T. (2010). *Epidemiologia básica - 2.ed*. São Paulo, Santos.

Bortoluzzi, E., Doring, M., Portella, M., Cavalcanti, G., Mascarelo, A., & Dellani, M. (2017). Prevalência e fatores associados a dependência funcional em idosos longevos. *Revista Brasileira de Atividade Física & Saúde*, *22*(1), 85–94. https://doi.org/10.12820/rbafs.v.22n1p85-94

Carvalho, A. D., & Souza, É. P. de. (2017). O Idoso e as Dores Crônicas: como Viver com Elas. *Id on Line REVISTA DE PSICOLOGIA*, *11*(38), 689–700. https://doi.org/10.14295/idonline.v11i38.966

Celich, K. L. S., & Galon, C. (2009). Dor crônica em idosos e sua influência nas atividades da vida diária e convivência social. *Revista Brasileira de Geriatria e Gerontologia*, *12*(3), 345–359. https://doi.org/10.1590/1809-9823.2009.00004

Curtis, E., Litwic, A., Cooper, C., & Dennison, E. (2015). Determinants of Muscle and Bone Aging. In *Journal of Cellular Physiology* (Vol. 230, Issue 11, pp. 2618–2625). Wiley-Liss Inc. https://doi.org/10.1002/jcp.25001

da Silva, E. C., Lazarini, V. V., Cortez, D. A. G., & Cortez, L. E. R. (2016). CLASSIFICAÇÃO DE RISCO DE IDOSOS ATENDIDOS EM UMA UNIDADE DE URGÊNCIA E EMERGÊNCIA. *Enciclopédia Biosfera*, *13*(23), 1467–1478. https://doi.org/10.18677/enciclopedia_biosfera_2016_131

Del Duca, G. F., Silva, M. C. Da, & Hallal, P. C. (2009). Incapacidade funcional para atividades básicas e instrumentais da vida diária em idosos. *Revista de Saúde Pública*, *43*(5), 796–805.

Dellaroza, M. S. G., Pimenta, C. A. de M., Duarte, Y. A., & Lebrão, M. L. (2013). Chronic pain among elderly residents in São Paulo, Brazil: Prevalence, characteristics, and association with functional capacity and mobility (SABE study). *Cadernos de Saude Publica*, *29*(2), 325–334. https://doi.org/10.1590/s0102-311x2013000200019

Dellaroza, M. S. G., & Pimenta, C. A. M. (2012). Impacto da dor crônica nas atividades de vida diária de idosos da comunidade1. *Ciência, Cuidado e Saúde*, *11*(5), 235–242. https://doi.org/10.4025/cienccuidsaude.v11i5.17081

dos Santos, V. R., Gobbo, L. A., Christofaro, D. G. D., Gomes, I. C., Mota, J., Gobbi, S., & Júnior, I. F. F. (2016). Doenças osteoarticulares e desempenho físico de idosos Brasileiros com idade igual ou superior a 80 anos. *Ciencia e Saude Coletiva*, *21*(2), 423–430. https://doi.org/10.1590/1413-81232015212.16032015

Esquenazi, D., Da Silva, S. B., & Guimarães, M. A. (2014). Aspectos fisiopatológicos do envelhecimento humano e quedas em idosos. *Revista Hospital Universitário Pedro Ernesto*, *13*(2), 11–20. https://doi.org/10.12957/rhupe.2014.10124

Feltrin, J. G. da S., Lovatel, G. A., & Bezerra, P. P. (2015). Dor crônica em idosos institucionalizados e não institucionalizados e sua relação com a cognição, capacidade funcional, depressão e qualidade de vida. *REVISTA INSPIRAR*, *7*(2), 27–32.

Ferreira, G. D., Silva, M. C., Rombaldi, A. J., Wrege, E. D., Siqueira, F. V, & Hallal, P. C. (2011). Prevalência de dor nas costas e fatores associados em adultos do Sul do Brasil: estudo de base populacional. *Revista Brasileira de Fisioterapia*, *15*(1), 31–36. https://doi.org/10.1590/S1413-35552011005000001

Gold, D. T., & Roberto, K. A. (2000). Correlates and consequences of chronic pain in older adults. *Geriatric Nursing*, *21*(5), 270–273. https://doi.org/10.1067/mgn.2000.110838

IBGE. (2020). IBGE | Cidades@ | Brasil | Panorama. In *Instituto Brasileiro de Geografia e Estatística*. https://cidades.ibge.gov.br/brasil/panorama

Katz, S., Ford, A. B., Moskowitz, R. W., Jackson, B. A., & Jaffe, M. W. (1963). Studies of Illness in the Aged: The Index of ADL: A Standardized Measure of Biological and Psychosocial Function. *JAMA: The Journal of the American Medical Association*, *185*(12), 914–919. https://doi.org/10.1001/jama.1963.03060120024016

Kuorinka, I., Jonsson, B., Kilbom, A., Vinterberg, H., Biering-Sørensen, F., Andersson, G., & Jørgensen, K. (1987). Standardised Nordic questionnaires for the analysis of musculoskeletal symptoms. *Applied Ergonomics*, *18*(3), 233–237. https://doi.org/10.1016/0003-6870(87)90010-X

Lawton, M. P., & Brody, E. M. (1969). Assessment of older people: Self-maintaining and instrumental activities of daily living. *Gerontologist*, *9*(3), 179–186. https://doi.org/10.1093/geront/9.3_Part_1.179

Maia, I., Xara, S., Vaz, D., Shiang, T., & Amaral, T. F. (2018). Undernutrition risk at hospital admission and length of stay among pulmonology inpatients. *Pulmonology*, *24*(6), 330–336. https://doi.org/10.1016/j.pulmoe.2018.01.004

Melo, A. C. F., Nakatani, A. Y. K., Pereira, L. V., Menezes, R. L. de, & Pagotto, V. (2017). Prevalência de doenças musculoesqueléticas autorreferidas segundo variáveis demográficas e de saúde: estudo transversal de idosos de Goiânia/GO. *Cadernos Saúde Coletiva*, *25*(2), 138–143. https://doi.org/10.1590/1414-462x201700010274

Miranda, V. S., Decarvalho, V. B. F., MacHado, L. A. C., & Dias, J. M. D. (2012). Prevalence of chronic musculoskeletal disorders in elderly Brazilians: A systematic review of the literature. In *BMC Musculoskeletal Disorders* (Vol. 13). BMC Musculoskelet Disord. https://doi.org/10.1186/1471-2474-13-82

Mody, G. M., & Brooks, P. M. (2012). Improving musculoskeletal health: Global issues. *Best Practice & Research Clinical Rheumatology*, *26*(2), 237–249. https://doi.org/10.1016/j.berh.2012.03.002

Pereira, A. S., Shitsuka, D. M., Parreira. F. J., & Shitsuka, R. (2018). Metodologia da pesquisa científica. Santa Maria:UAB/NTE/UFSM.https://repositorio.ufsm.br/bitstream/handle/1/15824/Lic_Computacao_Metodologia- Pesquisa-Cientifica.pdf?sequence=1.

Reis, L. A., & Torres, G. de V. (2011). Influência da dor crônica na capacidade funcional de idosos institucionalizados. *Revista Brasileira de Enfermagem*, *64*(2), 274–280. https://doi.org/10.1590/s0034-71672011000200009

Romero, D. E., Santana, D., Borges, P., Marques, A., Castanheira, D., Rodrigues, J. M., & Sabbadini, L. (2018). Prevalência, fatores associados e limitações relacionados ao problema crônico de coluna entre adultos e idosos no Brasil. *Cadernos de Saude Publica*, *34*(2), e00012817–e00012817. https://doi.org/10.1590/0102-311X00012817

Silveira, V. D. C., & Paskulin, L. M. G. (2014). PErfil e rede de apoio de idosos internados no serviço de emergência do hospital de clínicas de porto alegre. *Estudos Interdisciplinares Sobre o Envelhecimento*, *19*(2). https://doi.org/10.22456/2316-2171.40025

Tavares, D. M. dos S., & Dias, F. A. (2012). Capacidade funcional, morbidades e qualidade de vida de idosos. *Texto e Contexto Enfermagem*, *21*(1), 112–120. https://doi.org/10.1590/S0104-07072012000100013

Thumé, E., Facchini, L. A., Wyshak, G., & Campbell, P. (2011). The utilization of home care by the elderly in Brazil's primary health care system. *American Journal of Public Health*, *101*(5), 868–874. https://doi.org/10.2105/AJPH.2009.184648

Treede, R. D., Rief, W., Barke, A., Aziz, Q., Bennett, M. I., Benoliel, R., Cohen, M., Evers, S., Finnerup, N. B., First, M. B., Giamberardino, M. A., Kaasa, S., Korwisi, B., Kosek, E., Lavand'Homme, P., Nicholas, M., Perrot, S., Scholz, J., Schug, S., … Wang, S. J. (2019). Chronic pain as a symptom or a disease: The IASP Classification of Chronic Pain for the International Classification of Diseases (ICD-11). In *Pain* (Vol. 160, Issue 1, pp. 19–27). Lippincott Williams and Wilkins. https://doi.org/10.1097/j.pain.0000000000001384

Zullig, L. L., Bosworth, H. B., Jeffreys, A. S., Corsino, L., Coffman, C. J., Oddone, E. Z., Yancy, W. S., & Allen, K. D. (2015). The association of comorbid conditions with patient-reported outcomes in Veterans with hip and knee osteoarthritis. *Clinical Rheumatology*, *34*(8), 1435–1441. https://doi.org/10.1007/s10067-014-2707-y