Prevalence of Low Back Pain in Orthopedics and Traumatology Specialists: A Cross-sectional Study

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ABSTRACT

Introduction: Up to 85% of the population will suffer at least one episode of low back pain throughout their lives. It is one of the most common complaints among healthcare workers, with a reported annual prevalence of 77%. Orthopedic surgeons have multiple risk factors for developing this condition. The objective of this study was to evaluate the prevalence of low back pain and identify possible contributing factors in a sample of orthopedic surgeons. **Materials and Methods:** A cross-sectional observational analytical study on low back pain in Orthopedics and Traumatology specialists who are members of the AAOT. Over the course of one month, a questionnaire was sent weekly. **Results:** 393 responses were received, the predominant sex was male, and the mean age was 46 years. More than 50% of the sample reported being overweight, whereas 43% reported being sedentary. The average self-perceived work stress was 7. 86% of respondents reported at least one episode in the previous year, with 38% reporting more than four. **Conclusions:** The prevalence of low back pain was high. Acute episodes predominated, and complementary studies were not necessary. Less than 10% took time off work. Sedentary habits, comorbidities, and age were all associated with an increased likelihood of suffering >2 episodes of pain.

Keywords: Low back pain; orthopedics and traumatology specialists; epidemiology; prevalence.
Level of Evidence: III

Frecuencia del dolor lumbar en médicos especialistas en Ortopedia y Traumatología: estudio transversal

RESUMEN

Introducción: Hasta el 85% de la población padecerá, al menos, un episodio de dolor lumbar a lo largo de su vida. Representa una de las principales quejas del personal de salud, y tiene una prevalencia anual del 77%; los traumatólogos tenemos múltiples factores de riesgo para desarrollar este cuadro. El objetivo de este estudio fue evaluar la prevalencia de lumbalgia e identificar posibles factores asociados, en una muestra de médicos traumatólogos. **Materiales y Métodos:** Estudio analítico observacional transversal sobre el padecimiento de dolor lumbar en médicos especialistas en Ortopedia y Traumatología, miembros de la AAOT. El cuestionario se envió semanalmente durante un mes. **Resultados:** Se recibieron 393 respuestas, predominó el sexo masculino, y la media de la edad era de 46 años. Más del 50% de la muestra refirió sobrepeso, y el 43%, sedentarismo. La media de autopercepción de estrés laboral fue de 7. Un 86% afirmó haber sufrido, al menos, un episodio en el último año y un 38%, más de 4 episodios. **Conclusiones:** La prevalencia de lumbalgia fue alta. Predominaron los episodios agudos, no fueron necesarios estudios complementarios. Menos del 10% hizo reposo laboral. El hábito sedentario, el número de comorbilidades y la edad se asociaron con un riesgo más alto de sufrir >2 episodios de dolor.

Palabras clave: Lumbalgia; especialistas en Ortopedia y Traumatología; epidemiología; prevalencia.
Nivel de Evidencia: III

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INTRODUCTION

Lumbago or low back pain are medical terms used to refer to pain, stiffness or muscle tension in the region from the last rib to the intergluteal area, with or without radiation to the lower limbs.[1] It is one of the main reasons for medical consultation and the first cause of absenteeism from work, and its socioeconomic impact is high. It affects both men and women and up to 85% of the population will suffer at least one episode of low back pain in their lifetime.[2]

In Argentina, low back pain is the main cause of disability and is one of the main reasons for medical consultation, both in the public and private sectors. Although there are no reliable statistics on the prevalence of low back pain in our country, some publications indicate that it is the third most frequent cause of occupational disease and the most frequent cause of hospitalization within musculoskeletal conditions between 2006 and 2010.[3,4]

Low back pain is one of the most common complaints among health professionals; the documented annual prevalence is 77%. Working conditions, a lack of exercise, and psychosocial factors such as stress, holding multiple jobs, and working long hours are all considered risk factors for experiencing these episodes. In various studies, it has been shown that the branches within health professionals with a higher risk of suffering low back pain are: Obstetrics and Gynecology, Orthopedics and Traumatology, Nursing, and Kinesiology, with an incidence ranging from 34.3% to 83.9%.[5-8]

Orthopedics and Traumatology specialists are susceptible to repetitive twisting and bending movements, lifting loads and non-ergonomic postures, even wearing lead aprons for long periods of time. All of the above are considered risk factors for episodes of low back pain.[9,10]

The objectives of this study were to describe the prevalence of low back pain and to identify possible factors associated with its appearance in a sample of physicians specializing in Orthopedics and Traumatology.

MATERIALS AND METHODS

A cross-sectional observational analytical study on low back pain was conducted using a questionnaire distributed to physicians specializing in orthopedics and traumatology who are members of the *Asociación Argentina de Ortopedia y Traumatología* (Argentine Association of Orthopedics and Traumatology- AAOT). The questionnaire was sent out weekly for one month between March 1 and 31, 2023 and was distributed with the collaboration of the AAOT Morbidity and Mortality Committee.

The questionnaire was sent by e-mail and other messaging applications to physicians registered in the AAOT database who agreed to receive e-mails from the institution. Male and female physicians specializing in Orthopedics and Traumatology affiliated with the AAOT were included. Incomplete or blank questionnaires were excluded.

The study variables were recorded in a digital questionnaire prepared by the research team. The dependent variable "low back pain" was recorded as the number of episodes of low back pain in the last year. Information was also obtained on the duration of the episode, pain intensity, diagnosis, treatment and the need for sick leave.

Sociodemographic variables were included (age, sex, work sector [public or private], region of the country where he/she works, marital status, number of children, and subspecialty), as well as clinical and anthropometric variables, such as comorbidities, smoking, weight and height (with calculation of body mass index), level of weekly physical activity, previous spinal disease, and history of spinal surgery. Variables associated with the work activity of the orthopedic surgeons were recorded, such as professional seniority, private practice activity, operating room and on-call activity, use of lead aprons during surgeries, perception of job satisfaction, and stress level.

The survey was conducted in accordance with the Declaration of Helsinki, respecting the anonymity of the research subjects and health centers. All physicians gave their consent for their participation by answering the form.

Statistical Analysis

Categorical variables are expressed as number and percentage, and were analyzed with the $\chi 2$ test or Fisher's test. Interval variables are described with the mean and median, according to their distribution and their measures of dispersion, standard deviation (SD) and range. Student's t test or Mann-Whitney U test were used to compare continuous variables, according to the distribution expressed. Two groups were formed for comparison according to the frequency of the dependent variable, considering trauma specialists with "1 or no episodes of low back pain" versus those with "2 or more episodes of low back pain". To dichotomize the dependent variable, the criterion used was that low back pain is a frequent condition in the adult population and it is estimated that 84% of adults suffer at least one episode of low back pain at some point in their lives.[1,10-11] A bivariate analysis was performed to estimate the association between independent variables and the outcome variable. Subsequently, binary logistic regression was performed as a multivariate analysis model to measure the strength of the associations that were statistically significant in the bivariate analysis. A p-value <0.05 was considered statistically significant. SPSS Statistics 25 was used for the analysis.

RESULTS

Data were obtained from 393 completed questionnaires. The mean age of respondents was 46 years (SD = ±12; range 28-81); 323 (82.2%) were male and 68 (17.3%) were female. Two (0.5%) chose not to answer about their sex. Table 1 summarizes the sociodemographic characteristics of the sample.

Anthropometric characteristics were recorded according to body mass index and the presence of comorbidities among the trauma specialists in our sample (Table 2). 72.8% (n = 286) reported having one or no comorbidities. The median number of comorbidities is 1 (range 0-7). Smokers accounted for approximately 10% of the sample (n = 39; 9.9%). Considering the World Health Organization recommendations on weekly physical activity (2.5 to 5 h),[12] 43% (n = 170) had sedentary habits. According to body mass index, more than 50% were overweight, obese or morbidly obese (n = 260; 66.1%).

Regarding work activity, almost half of the sample worked more than 20 hours per week in the office and 41% (n=164) worked on call every week. The median time spent on surgical activity was 10 h per week (range 0-72). Surgeons stood for the majority of surgeries and sat for fewer than 25% of the procedures (n = 315; 80%). Approximately one-third (n = 123; 31%) used a lead apron during more than 50% of surgeries. The perception of job stress level of the surveyed specialists registered a median of 7 (range 0-10). The median perceived level of job satisfaction was 7 (range 0-10) (Table 3).

Low Back Pain in Trauma Specialists

The majority of respondents (n = 338; 86%) reported having suffered at least one episode of low back pain in the last year and 38% (n = 149) more than four episodes (Figure 1). Fifty percent (n = 173) suffered pain with intensity >5 (according to the 0-10 visual analog scale), with a median low back pain score of 6 (range 0-10) (Figure 2). Acute episodes lasting less than 10 days predominated (n = 279; 81%) (Figure 3), with no request for complementary studies (n = 279; 81%) (Figure 4) or referral to a specialist (no referral: n = 312; 79.4%). Fewer than 10% of the trauma specialists who had suffered episodes of low back pain in the previous year took sick leave (n = 25; 6.4%). The median time off work was three days (range 0-30).

Comparison according to low back pain

To facilitate multivariate analysis, categorical variables were dichotomized: work sector (public; private/both), body mass index (≥25), weekly physical activity (<2 h of activity per week), years of work experience (>10 or <10), weekly office hours (>20 or <20), weekly on-call hours (0-12 h, >12 h), sitting during surgeries (>25% or <25% of surgeries), use of lead apron (>50% or >50% of surgeries), perception of work stress (>5 or <5).

Table 1. Sociodemographic characteristics of the sample

Variables		Results
Age; mean (SD; range)		46 (±12; 28-81)
Sex, n (%)	Male	323 (82.2)
	Female	68 (17.3)
	Prefer not to say	2 (0.5)
Region, n (%)	AMBA	181 (46.2)
	Cuyo	18 (4.6)
	Northeast	29 (7.4)
	Northwest	27 (6.9)
	Pampa region	99 (25.3)
	Patagonia	38 (9.7)
Marital status; n (%)	Single	55 (14.1)
	Married	214 (55.0)
	Cohabiting	91 (23.4)
	Widowed	4 (1.0)
	Divorced	25 (6.4)
Number of children; median (range)		2 (0-4)
Work sector; n (%)	Public	43 (10.9)
	Private	143 (36.4)
	Both	207 (52.7)
Subspecialty; n (%)	Hip and knee (arthroplasty)	69 (17.6)
	Spine	43 (10.9)
	Arthroscopy	52 (13.2)
	Sports	13 (3.3)
	Pediatric orthopedics	32 (8.1)
	Upper limb	32 (8.1)
	Orthopedic oncology	3 (0.8)
	Leg, ankle and foot	49 (12.5)
	Trauma	57 (14.5)
	Other	43 (10.9)
Years in practice; median (range)	<5 years	94 (23.9)
	5-10 years	74 (18.8)
	11-15 years	67 (17.0)
	16-20 years	43 (10.9)
	>20 years	115 (29.3)

SD = standard deviation. AMBA = Buenos Aires Metropolitan Area (Autonomous City of Buenos Aires and districts of the province of Buenos Aires); Cuyo = Mendoza, San Juan, and San Luis; Northeast = Chaco, Corrientes, Formosa, and Misiones; Northwest = Catamarca, Jujuy, Tucumán, Salta, La Rioja, and Santiago del Estero; Pampa region = La Pampa, Buenos Aires, Córdoba, Entre Ríos, and Santa Fe; Patagonia = Neuquén, Río Negro, Santa Cruz, Tierra del Fuego.

Table 2. Clinical variables of the trauma specialists included in the sample.

Variables		Resultados
Number of comorbidities; median (range)		1 (0-7)
Smoking; n (%)		39 (9.9)
Physical activity; n (%)	None	73 (18.6)
	<2 h per week	97 (24.7)
	3-5 h per week	142 (36.1)
	5-8 h per week	62 (15.8)
	>8 h per week	19 (4.8)
Leisure time in hours per week; median (range)		6.50 (0-72)
BMI; n (%)	Underweight	1 (0.3)
	Normal	124 (32.2)
	Overweight	179 (46.5)
	Obesity	63 (16.4)
	Morbid obesity	18 (4.7)
Spinal pathology; n (%)		92 (23.4)
Spine surgery; n (%)		13 (3.3)

BMI = body mass index.

Table 3. Respondents' employment characteristics

Variables		Results
Office hours per week; n (%)	<20	198 50.4
	20-30	156 39.7
	>30	39 9.9
Operating room hours per week; median (range)		10 (0-72)
% of surgeries performed seated; n (%)	0	186 (47.3)
	0-25	129 (32.8)
	26-50	36 (9.2)
	51-75	25 (6.4)
	>75	17 (4.3)
On-call hours per week (minimum); n (%)	0	229 (58.3)
	12	25 (6.4)
	24	86 (21.9)
	36	11 (2.8)
	48	33 (8.4)
	72	9 (2.3)
% of surgeries with lead vest; n (%)	<25	203 (51.7)
	26-50	67 (17.0)
	51-75	86 (21.9)
	>75	37 (9.4)
Stress level; median (range)*		7 (0-10)
Level of job satisfaction; median (range)*		7 (0-10)

*According to the ordinal scale from 0 to 10.

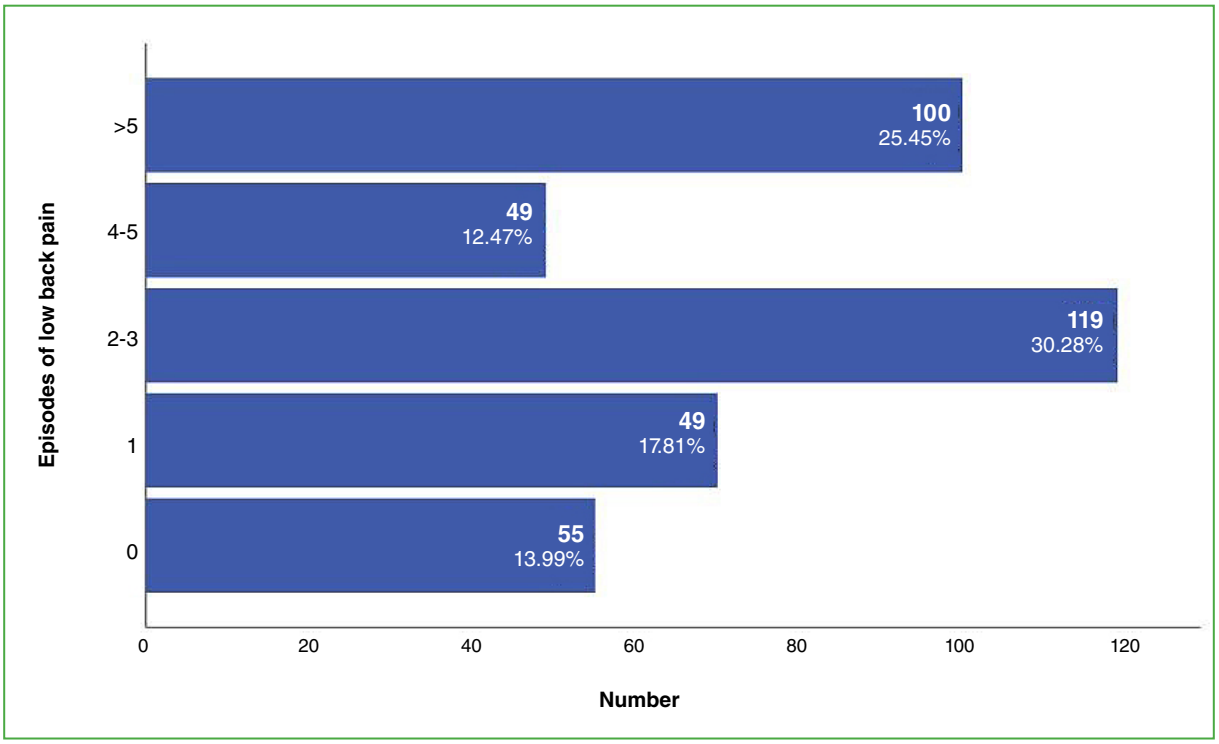

Figure 1. Bar graph: distribution of the number of episodes of low back pain in the previous year.

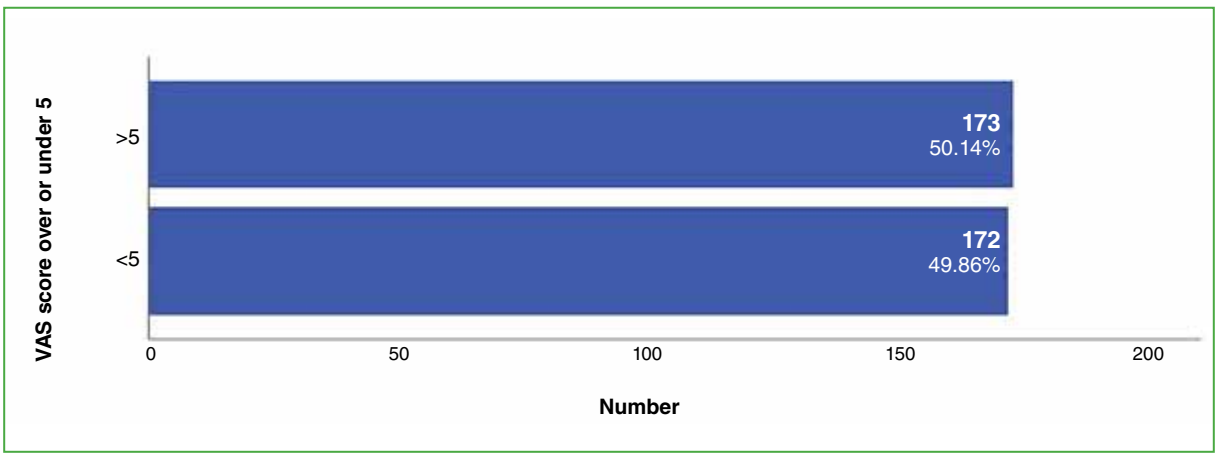

Figure 2. Bar graph: distribution of low back pain intensity (>5 or <5) according to the visual analog scale.

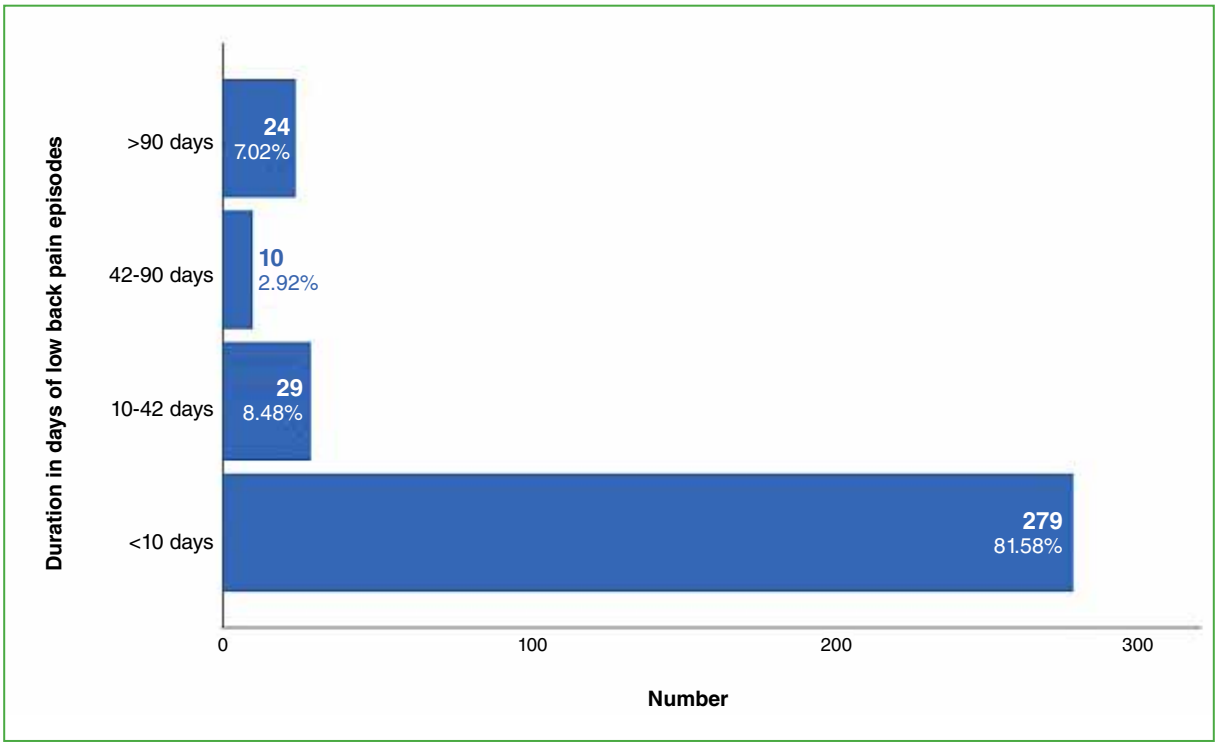

Figure 3. Bar graph: distribution of the duration of episodes of low back pain.

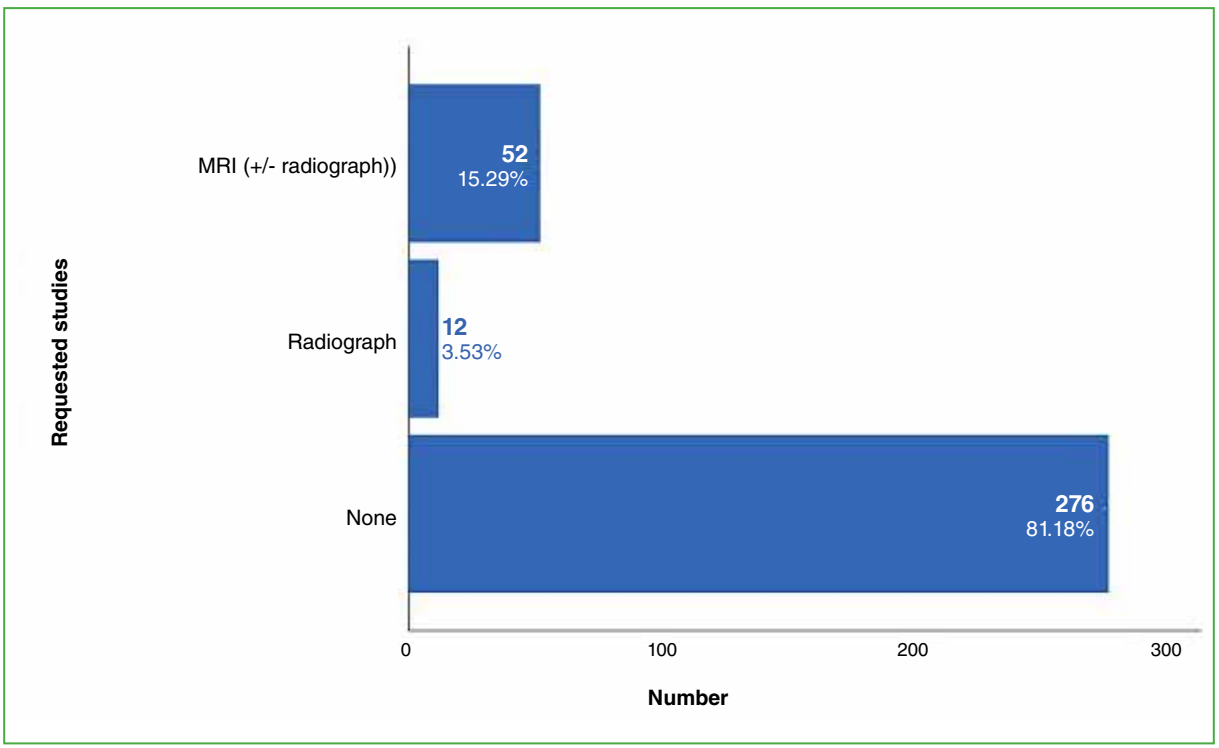

Figure 4. Bar graph: distribution of the request for studies.

As a result of the bivariate analysis when comparing the groups according to low back pain, "<1 episode" vs. "2 or more episodes", the variables age (p = 0.046), number of comorbidities (p <0.001), physical activity <2 h per week (p = 0.004), previous spinal disease (p = 0.001) and perception of work stress >5 (p = 0.026) were statistically significant. Table 4 lists all the variables included in the comparison.

Table 4. Comparison according to episodes of low back pain in the previous year (n = 393).

Variables		<1 episodes (n = 125)	2 or more episodes (n = 268)	p
Age; mean (SD; range)		48 (± 11; 30-77)	45 (± 12; 28-81)	0.046
Sex, n (%)	Male	102 (81.6)	221 (82.5)	0.851
	Female	22 (17.6)	46 (17.2)	
	Prefer not to say	1 (0.8)	1 (0.4)	
Marital status; n (%)	Single/widowed/divorced	26 (20.8)	58 (21.6)	0.850
	Married/Cohabiting	99 (79.2)	210 (78.4)	
Work sector; n (%)	Public	11 (8.8)	32 (11.9)	0.353
	Private or both	114 91.2)	236 (88.1)	
Number of comorbidities; median (range)		1 (0-4)	1 (0-7)	<0.001
BMI ≥25; n (%)		80 (64.0)	184 68.7)	0.360
Smoking; n (%)		10 (8.0)	29 (10.8)	0.384
Physical activity <2 h per week; n (%)		41 (32.8)	129 (48.1)	0.004
Spinal pathology; n (%)		16 (12.8)	76 (28.4)	0.001
Spine surgery; n (%)		2 (1.6)	11 (4.1)	0.196
>10 years of experience; n (%)		80 (64.0)	145 (54.1)	0.065
>20 office hours per week; n (%)		62 (49.6)	133 (49.6)	0.996
On-call hours per week; n (%)	0-12	88 (70.4)	166 (61.9)	0.102
	>12	37 (29.6)	102 (38.1)	
Surgical hours per week; median (range)		10 (0-90)	10 (0-72)	0.470
Surgeries performed seated; n (%)	<25% of surgeries	97 (77.6)	218 (81.3)	0.386
	>25% of surgeries	28 (22.4)	50 (18.7)	
Use of lead vest; n (%)	<50% of surgeries	83 (66.4)	187 (69.8)	0.501
	>50% of surgeries	42 (33.6)	81 (30.2)	
Work stress >5; n (%)		103 (82.4)	242 (90.3)	0.026

SD = standard deviation.

Subsequently, as a result of the multivariate analysis through the binary logistic regression model, only the association of the variables age (odds ratio [OR] = 0.958; 95%CI = 0.938-0.979; p <0.001), number of comorbidities (OR=1.874; 95%CI=1.421-2.472; p <0.001), and physical activity <2 h (OR=1.813; 95%CI=1.139-2.887; p <0.001) remained statistically significant (Table 5).

Table 5. Binary logistic regression

Variables	OR	CI95%		
		Lower	Upper	p
Age	0.958	0.938	0.979	<0.001
Number of comorbidities	1.874	1.421	2.472	<0.001
Physical activity <2 h/week	1.813	1.139	2.887	0.012

OR = odds ratio; 95%CI = 95% confidence interval.

The magnitude of the OR was higher for the number of comorbidities and for a sedentary lifestyle, estimated at <2 h of physical activity per week. Both variables were associated with an 87.4% and 81.3% increase, respectively, in the probability of having two or more episodes of low back pain. In the case of age, the odds ratio was close to 1 (0.958) and, from its value, it can be deduced that the probability of suffering two or more episodes of low back pain per year decreases by 4% for each year that age increases.

DISCUSSION

Health professionals are exposed to occupational risk factors that predispose to the development of low back pain. Orthopedic and Traumatology physicians are constantly exposed to demanding physical conditions that result in a high risk of musculoskeletal disorders. It has been shown that long hours in the operating room, the use of radioprotection, poor posture, repetitive movements, and weight lifting in non-ergonomic postures are factors that predispose to chronic pain and altered quality of life. According to international literature, 40-83.9% of orthopedic surgeons have experienced episodes of low back pain or cervical discomfort, and awareness of the condition and how to prevent it is not a protective factor in this population.[5-8,13-21]

In the field of Traumatology and Trauma Surgery, Scheidt et al.[17] found that using lead aprons causes postural overload, which is associated with more frequent pain, even in healthy young surgeons. In this study, one-third of the sample used a lead vest during more than 50% of the surgeries, but this was not associated with a significant increase in the incidence of low back pain.

Occupational low back pain is considered the most costly form of work disability; the expenses caused by chronic low back pain exceed by a large margin those caused by acute episodes.[20] This highlights the importance of identifying the different risk factors associated with low back pain episodes. Several publications have identified personal factors (age, sex, smoking, obesity) and occupational factors (number of hours standing/sitting, weight load, stress). The findings regarding body mass index and its association with low back pain are contradictory; in some studies, there is a significant association.[21-23]

In agreement with published findings,[7,21,25] physical activity acts as a protective factor; in our study, a significant association was found between a sedentary lifestyle and episodes of low back pain. There was a significant positive association between the presence of comorbidities and low back pain. Although stress was significant, this was disregarded in the multivariate analysis; in both groups, the level of stress was high, with a mean perception of 7/10. No significant relationship was found with sex, smoking, years of work experience, weekly on-call duty, use of vests and operating from a sitting position.

In terms of age, the probability of suffering two or more episodes of low back pain per year decreases by 4% for each year that age increases. This finding, in addition to being counterintuitive, is related with an increase in prob-

ability; nonetheless, the researchers believe it is not clinically significant, despite its statistical significance. Other studies (Alnaami et al.,[21] Terzi and Altın,[26] Grant et al.,[27] and Cacciatori et al.[28]) have obtained similar results and associated them with greater stress and greater economic activity in young surgeons, and with the adaptation of the activity that is acquired with experience.[24]

Xu et al.[28] conducted a systematic review of the literature on musculoskeletal injuries in trauma specialists associated with the biomechanics of the specialty's surgeries. They found a high incidence of injuries, with a predominance of low back pain (15-89.5%), cervical pain, (14-74%) and upper limb pathologies (particularly tendinopathies, 50%). However, despite the high rates of chronic pain, trauma specialists were less likely to seek treatment and miss work than a typical patient. The findings of our study are similar: fewer than 10% took sick leave. These authors reported that up to one-third of the specialists would require surgery to resolve their musculoskeletal disease with the consequent need for sick leave and the possible alteration of their surgical performance (letting a less experienced assistant perform certain surgical procedures), which could generate an impact on care. Furthermore, they emphasized the need to improve the conditions of these specialists in order to protect them from injury and satisfy the growing requirements of an aging global population in need of greater trauma solutions.

The weakness of the present study is its cross-sectional design, which is less capable of estimating the relationship between variables and does not allow the precise establishment of cause-and-effect relationships like longitudinal designs. On the other hand, non-probability sampling may be subject to possible selection bias. The variable "geographic region" was heterogeneous and had unbalanced groups. Most of the professionals documented were working in the Buenos Aires Metropolitan Area and the Pampa region, with less representation from the rest of the geographical areas. For this reason, it was not evaluated in the comparison and was only documented for descriptive purposes.

The strength of the study is that, according to the authors, it is the first study to analyze the prevalence of low back pain in this subgroup of health professionals in our country, and that the results are similar to those reported in international publications on the subject. It represents an original contribution to our field.

CONCLUSIONS

In our sample of physicians specializing in Orthopedics and Traumatology in Argentina, the prevalence of episodes of low back pain was high. Eighty-six percent reported having had at least one episode in the last year and 38% reported >4 episodes. Acute episodes lasting <10 days predominated, with no need for complementary studies. Fewer than 10% of the trauma specialists took sick leave due to low back symptoms. After multivariate analysis, the number of comorbidities, age, and having a sedentary lifestyle were associated with suffering two or more episodes of low back pain.

Conflict of interest: The authors have no conflicts of interest to declare.

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