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ORIGINAL RESEARCH

Low back pain in university students: what is the impact of COVID-19 pandemic?

Dor lombar em estudantes universitários: qual o impacto da pandemia de COVID-19?

Dolor lumbar en universitarios: ¿cuál es el impacto de la pandemia del COVID-19?

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ABSTRACT | The social isolation resulting from the COVID-19 pandemic has changed the population's habits and raised health-related issues, such as low back pain. This study aimed to evaluate the prevalence and risk of chronic low back pain in university students during the social isolation of COVID-19. We used an online questionnaire, the STarT Back Screening Tool (SBST), to check for low back pain. The factors investigated: sociodemographic data, pain, sedentary behavior, and physical activity. For proportion heterogeneity, we used the chi-square test. The adjusted analysis used Poisson regression with robust variance. A total of 208 students participated in the sample. University students with a partner were twice as likely to have pain (PR=2.07; 95%CI). The prevalence of low back pain was 48.1%; 87% (PR=1.87; 95%CI: 1.09–3.21; p=0.027) higher in women. University students with obesity were 42% more likely to have low back pain (PR=1.42; 95%CI: 1.04–1.94; p=0.032); and with sedentary behavior were 35% more likely to have low back pain (PR=1.36; 95%CI: 1.02–1.81; p=0.038). In total, 82% of the sample presented low risk of chronicity. Many people presented low back pain during the social isolation imposed by COVID-19. This is a common, limiting problem that must be considered and treated as a health and research priority.

Keywords | Low Back Pain; COVID-19; Social Isolation; Students.

RESUMO | O isolamento social decorrente da pandemia de COVID-19 alterou os hábitos da população e levantou questões relacionadas à saúde, por exemplo, a dor lombar. Este estudo teve por objetivo avaliar a prevalência e o risco de cronicidade de dor lombar em universitários durante o isolamento social. Para isso, foi utilizado um questionário on-line. O instrumento *STarT Back Screening Tool* (SBST) foi utilizado para verificar a dor lombar. Os fatores investigados foram: dados sociodemográficos, informações sobre dor e informações sobre comportamento sedentário e atividade física. Utilizou-se o teste de qui-quadrado para heterogeneidade de proporções. A análise ajustada foi realizada mediante regressão de Poisson com variância robusta. A amostra foi composta por 208 estudantes. Verificou-se que universitários com companheiro apresentaram duas vezes mais chance de dor (RP=2,07; IC95%) em comparação aos solteiros. A prevalência de dor lombar foi de 48,1%; sendo 87% maior nas mulheres (RP=1,87; IC95%: 1,09-3,21; p=0,027) quando comparadas aos homens. Universitários com comportamento sedentário apresentaram uma probabilidade 35% maior de ter dor lombar (RP=1,36; IC95%: 1,02-1,81; p=0,038); e obesos 42% (RP=1,42; IC95%: 1,04-1,94; p=0,032). O risco de cronicidade foi baixo em 82% da amostra. A dor lombar esteve presente na vida de muitas pessoas durante o isolamento social imposto pela COVID-19. Trata-se de um problema comum, limitante, e que deve ser considerado e tratado como prioridade em saúde e pesquisa.

Descritores | Dor Lombar; COVID-19; Isolamento Social; Estudantes.

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RESUMEN | El aislamiento social derivado de la pandemia del COVID-19 ha cambiado los hábitos de la población y planteado problemas relacionados con la salud, como el dolor lumbar. Este estudio tuvo como objetivo evaluar la prevalencia y el riesgo de dolor lumbar crónico en estudiantes universitarios durante el aislamiento social. Para ello, se utilizó un cuestionario en línea. Se utilizó la herramienta *STarT Back Screening Tool* (SBST) para detectar el dolor lumbar. Los factores investigados fueron: datos sociodemográficos, información sobre el dolor e información sobre sedentarismo y actividad física. Se utilizó la prueba de chi-cuadrado para la heterogeneidad de proporciones. El análisis ajustado se realizó mediante la regresión de Poisson con varianza robusta. La muestra estuvo conformada por 208 estudiantes. Se encontró que los estudiantes universitarios con pareja tenían el doble de probabilidades de tener dolor (RP=2,07; IC95%) en comparación con los estudiantes solteros. La prevalencia de dolor lumbar fue de 48,1%; siendo un 87% mayor en mujeres (RP=1,87; IC95%: 1,09-3,21; p=0,027) en comparación con los hombres. Los universitarios con comportamiento sedentario tenían un 35% más de probabilidad de tener dolor lumbar (RP=1,36; IC95%: 1,02-1,81; p=0,038); y obesos 42% (RP=1,42; IC95%: 1,04-1,94; p=0,032). El riesgo de cronicidad fue bajo en el 82% de la muestra. El dolor lumbar estuvo presente en la vida de muchas personas durante el aislamiento social provocado por el COVID-19. Es un problema común, limitante, que debe ser considerado y tratado como una prioridad en salud e investigación.

Palabras clave | Dolor Lumbar; COVID-19; Aislamiento Social; Estudiantes.

INTRODUCTION

Musculoskeletal pain is frequent in the academic environment. Students spend many hours sitting, using notebooks and mobile phones, in sometimes inadequate postures. A recent study reported a high prevalence of musculoskeletal pain in the spine among university students, 54.5% of them with low back pain[1]. Low back pain is the leading cause of disability worldwide in recent years, higher in the age groups of the economically active population and in low and middle income countries[2].

Since most people experience low back pain at some point in their lives, it became one of the main reasons for seeking health care, in addition to the circumstances of the ongoing COVID-19 pandemic[3]. The World Health Organization (WHO) currently classified COVID-19, a disease caused by the SARS-CoV-2 virus, as a pandemic. To reduce the transmission of the virus and its complications, sanitary measures such as social distancing and isolation were adopted worldwide[4].

How individuals interconnect and incorporate themselves into communities deeply impacts on health and longevity[5]. Social isolation is an important concern in the well-being of the population, and relates with health problems[5,6]. Given the scenario caused by the pandemic, the population changed their habits and reduced practice of physical activities. These changes can lead to a large number of musculoskeletal dysfunctions[4].

Responsible for loss of productivity at work and high health costs, low back pain is a priority of health and research in Brazil[7]. The social distancing imposed by the COVID-19 pandemic raised health issues related to musculoskeletal pain, for example, low back pain. As a result, this study aims to evaluate the prevalence and risk of chronic back pain in university students during this period as a result of the pandemic.

METHODOLOGY

This is a prospective cross-sectional observational study. The convenience sample were university students of both sexes, with no age limit, regularly enrolled at the Universidade do Vale do Rios dos Sinos (Unisinos), in the municipality of São Leopoldo, state of Rio Grande do Sul. All participants signed the informed consent form.

Inclusion criterion was: to be regularly enrolled in the semesters 2020/1 and 2020/2 at Unisinos. Exclusion criteria were: any pain before the pandemic, any accident during the pandemic and, consequently, any musculoskeletal dysfunction.

Data collection were from December 16, 2020 to January 16, 2021, using an online questionnaire, published through social networks. The questionnaire was divided into blocks about sociodemographic data (age, gender, course, semester, marital status), pain (period, duration, region diagram, numeric rating scale, brief pain inventory), low back pain specifically (STarT Back Screening Tool – SBST), sedentary behavior and physical activity (International Physical Activity Questionnaire – IPAQ), as well as an open question for reports that have not been contemplated in the questionnaire.

The numeric rating scale (NRS) was used to quantify the level of pain intensity that the student felt during the pandemic until the time of data collection (March to May, June to August and September to December 2020). On a scale of whole numbers from 0 to 10, the patient selected the value that best represented the intensity of the pain: 0 means the absence of pain and 10 the maximum pain[8].

The brief pain inventory (BPI) – reduced version, which assess the intensity and interference of pain in the day-to-day, was also used. It offers a scale from 0 to 10, with 0 the absence of pain/no interference and 10 the maximum possible pain/total interference in the activities. The questionnaire has nine questions about pain in the last 24 hours and at the moment[8].

The SBST instrument was used to check for low back pain. Nine questions relate only to low back pain experienced in the last two weeks, and includes questions related to physical factors (pain) and psychosocial factors. Pain is classified as low, medium or high risk[9].

Sedentary behavior was defined by the time the individual spent, per day, performing activity without expending great energy, such as sitting at various times of the day[10]. Participants were physically active when they reached at least 150 minutes of physical activity per week, and insufficiently active as less than 150 minutes[11], used data from IPAQ – short version.

Descriptive statistics were performed. Categorical variables were described by means of absolute (n) and relative (%), and numerical variables were estimated using measures of central tendency (mean) and variability (standard deviation). To evaluate the difference between proportions, the chi-square test was used for heterogeneity of proportions. The adjusted analysis was performed by Poisson regression with robust variance. The variables that obtained p<0.20 in the crude analysis were selected for the adjusted analysis. Adjusted prevalence ratios (PR) and their respective 95% confidence intervals (95% CI) were estimated for the associations. Statistical analysis used the software Stata version 12.0 (Stata Corporation, College Station, Texas, USA). The significance level considered was 0.05%.

RESULTS

From the 11,255 students enrolled at the university, 219 answered the questionnaire, but 11 were excluded due to pain caused by accident, totaling 208 university students. The mean age was 23.5±4.2 years. The sample size allowed to analyze the association between pain and the characteristics investigated, with a 95% confidence level, 80% power, and 1.35 prevalence ratio (PR).

Table 1 presents the general characteristics of the sample of university students investigated. After adjusted analysis, we noticed a statistically significant association between marital status and the occurrence of pain during the pandemic. University students in union or who lived with a partner were twice as likely to have pain throughout the pandemic compared to single university students or who did not live with a partner (PR=2.07; 95%CI: 1.,03-4.14; p=0.013).

The prevalence of low back pain in the last 15 days was 48.1% (95% CI: 41.2-54.9%) (Table 2). After adjusted analysis, we noticed a statistically significant association between marital status and the occurrence of pain during the pandemic. The prevalence of low back pain was 87% higher in women (PR=1.87; 95%CI: 1.09-3.21; p=0.027). University students with longer sedentary behavior (≥5hs/day) had a 35% higher probability of having low back pain (PR=1.36; 95%CI: 1.02-1.81; p=0.038) than university students with less time. University students with obesity had a 42% higher probability of having low back pain (PR=1.42; 95%CI: 1.04-1.94; p=0.032) (Table 2).

Table 1. General sample characteristics and prevalence of pain during the COVID-19 pandemic (N=208)

Characteristic		Pain during the pandemic	Crude analysis		Adjusted analysis	
	n (%)	n (%)	PR (95%CI)	p-value*	PR (95%CI)	p-value*
Gender				0.614	--	
Women	168 (80.8)	31 (18.5)	1.00			
Men	40 (19.2)	6 (15.0)	1.23 (0.55-2.75)			
Age (years old)				0.147		0.835
≤20	43 (20.7)	6 (14.0)	1.00		1.00	
21 to 22	60 (28.9)	11 (18.3)	1.31 (0.53-3.29)		1.25 (0.52-3.02)	

(continues)

Table 1. Continuation

Characteristic		Pain during the pandemic	Crude analysis		Adjusted analysis	
	n (%)	n (%)	PR (95%CI)	p-value*	PR (95%CI)	p-value*
23 to 24	51 (24.5)	4 (7.8)	0.56 (0.17–1.87)		0.54 (0.16–1.80)	
>24	54 (25.9)	16 (29.6)	2.12 (0.91–4.97)		1.37 (0.53–3.52)	
Marital status				0.001		0.013
No partner	176 (84.6)	25 (14.2)	1.00		1.00	
With partner	32 (15.4)	12 (37.5)	2.64 (1.48–4.70)		2.07 (1.03–4.14)	
Study area (courses)				0.454	--	
Health	112 (53.9)	22 (19.6)	1.00			
Other areas	96 (46.1)	15 (15.6)	0.80 (0.44–1.45)			
Has a job (working)				0.669	--	
No	89 (42.8)	17 (19.1)	1.00			
Yes	119 (57.2)	20 (16.8)	0.88 (0.49–1.58)			
Tobacco use				0,037		0.135
Non-smoker	198 (95.2)	33 (16.7)	1.00		1.00	
Non-smoker/Former smoker	10 (4.8)	4 (40.0)	2.4 (1.05–5.46)		1.79 (0.81–3.99)	
Physical activity (n=197)				0.402	--	
Insufficiently active	78 (39.6)	12 (15.4)	1.00			
Physically active (≥150min/week)	119 (60.4)	24 (20.2)	1.31 (0.70–2.47)			
Sedentary behavior (n=200)				0.187		0.205
Adequate	138 (69.0)	29 (21.0)	1.00		1.00	
Inadequate (≥5hs/day)	62 (31.0)	8 (12.9)	0.61 (0.30–1.27)		0.69 (0.35–1.37)	
Obesity (BMI≥30kg/m^2)				0.513	--	
No	186 (89.4)	32 (17.2)	1.00			
Yes	22 (10.6)	5 (22.7)	1.32 (0.57–3.04)			
Diagnosis of COVID-19				0.230	--	
No	177 (85.1)	34 (19.2)	1.00			
Yes	31 (14.9)	3 (9.7)	0.50 (0.16–1.54)			

BMI: body mass index. *P-value for Wald chi-square test for heterogeneity of proportions (categorical variables) and for linear trend (ordinal variables).

Table 2. Prevalence of low back pain in the last 15 days and prevalence ratios of the COVID-19 pandemic (N=208)

Characteristic	Low back pain Last 15 days	Analysis crude		Analysis adjusted	
	n (%)	PR (95%CI)	p-value*	PR (95%CI)	p-value*
Gender			0.014		0.027
Men	11 (27.5)	1.00		1.00	
Women	89 (53.0)	1.93 (1.14–3.25)		1.87 (1.09–3.21)	
Age (years old)			0.072		0.123
≤20	18 (41.9)	1.00		1.00	
21 to 22	25 (41.7)	1.00 (0.63–1.58)		1.02 (0.64–1.63)	

(continues)

Table 2. Continuation

Characteristic	Low back pain Last 15 days	Analysis crude		Analysis adjusted	
	n (%)	PR (95%CI)	p-value*	PR (95%CI)	p-value*
23 to 24	26 (51.0)	1.22 (0.78–1.90)		1.25 (0.79–1.97)	
>24	31 (57.4)	1.37 (0.90–2.09)		1.38 90.85–2.25)	
Marital status			0.013		0.231
No partner	79 (44.9)	1.00		1.00	
With partner	21 (65.6)	1.46 (1.08–1.97)		1.23 (0.84–1.80)	
Study area (courses)			0.996	--	
Health	54 (48.2)	1.00			
Other areas	46 (47.9)	0.99 (0.75–1.32)			
Has a job (working)			0.235	--	
No	47 (52.8)	1.00			
Yes	53 (44.5)	0.84 (0.64–1.12)			
Tobacco use			0.071		0.077
Non-smoker	93 (47.0)	1.00		1.00	
Non-smoker/Former smoker	7 (70.0)	1.49 (0.97–2.30)		1.31 (0.96–1.80)	
Physical activity (n=197)			0.820	--	
Insufficiently active	38 (48.7)	1.00			
Physically active (≥150min/week)	56 (47.1)	0.97 (0.72–1.30)			
Sedentary behavior (n=200)			0.022		0.032
Adequate	57 (41.3)	1.00		1.00	
Inadequate (≥5hs/day)	36 (58.1)	1.41 (1.05–1.88)		1.36 (1.02–1.81)	
Obesity (BMI≥30 kg/m^2)			0.002		0.034
No	84 (45.2)	1.00		1.00	
Yes	16 (72.7)	1.61 (1.19–2.18)		1.42 (1.04–1.94)	
Diagnosis of COVID-19			0.192		0.131
No	82 (46.3)	1.00		1.00	
Yes	18 (58.1)	1.25 (0.89–1.76)		1.32 (0.91–1.90)	

BMI: body mass index. *P-value for Wald chi-square test for heterogeneity of proportions (categorical variables) and for linear trend (ordinal variables).

Applying the SBST, we found that 82% of the university students who reported low back pain in the last 15 days had low risk of chronicity, 14% medium risk and 4% high.

DISCUSSION

This study found a connection between marital status and the occurrence of pain during the pandemic period. We associated low back pain with women, sedentary behavior, obesity, and living with a partner.

Living with a partner has also been associated with pain. Despite corroborating other findings in the literature[12,13], the reasons for this association are uncertain. Marital status is probably a risk marker, related to behavioral characteristics of ergonomic, occupational and household risk, which is not risk factor itself.

The relationship between women and low back pain is established in the literature. Several studies indicate that the prevalence of low back pain is higher in women than in men[14-16]. Differences in the prevalence of low back pain between genders may be related to physiological characteristics, such as hormonal factors[15,16]. Many women also accumulate their professional work with household chores and childcare, generating an overload[14].

The prevalence of low back pain is associated with several causes and factors, such as sedentary lifestyle and obesity[17,18]. A study with women southern Brazil revealed that sedentary lifestyle was the greatest factor of association with chronic low back pain[19]. Another study, conducted in the state of São Paulo, showed that women who did some kind of physical activity had better quality of life and relief of low back pain[20]. The social isolation imposed by the COVID-19 pandemic can contribute even more to the relationship between low back pain and sedentary lifestyle, since the prolonged period at home makes people more likely to become or remain inactive[21,22].

Although necessary, social isolation measures had some negative effects on the health of the population. A recent study conducted in Asia, Africa and Europe showed that individuals who spent more time at home had more daily sitting time, in addition to negative results regarding physical activities and changes in eating behavior[23]. Obesity is a risk factor for low back pain, since the overload on joint structures, caused by excess body weight, increases the risk of spinal degeneration and musculoskeletal pain[13,24].

According to the SBST scale, most students (82%) had low risk of chronicity, whereas 14% and 4% had medium and high risk, respectively. According the literature[19], these findings confirm that physical factors interfere the most with low back pain. Individuals with a low risk of chronicity have good prognosis, even more when compared with medium and high risk chronicity levels, as probably psychosocial factors are involved in pain[9].

This study did not investigate psychosocial factors, such as anxiety, depression, mood changes, among others, because they could be related to both the pandemic and pain. This is a retrospective study, subject to limitations regarding memory bias. However, this effect is expected to be minimal, since low back pain is a remarkable event in people's lives, especially in situations of social isolation, as during the COVID-19 pandemic.

CONCLUSION

Low back pain was present in the lives of many people during the social isolation imposed by COVID-19. Marital status, female gender, sedentary behavior and obesity were associated with a higher probability of low back pain in the university students evaluated in the study. It consists in a common, limiting problem that should be considered and treated as a priority of health and research.

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