

Pilates instructors: prevalence of musculoskeletal pain, associated occupational factors and comparison of quality of life relative to Brazilian reference values

Instrutores do método pilates: prevalência de dor musculoesquelética com fatores ocupacionais associados e comparação da qualidade de vida com os dados normativos brasileiros

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ABSTRACT | **Background:** Pain is a public health problem with negative impact on quality of life. **Objective:** To analyze the prevalence of musculoskeletal pain and associated occupational factors among Pilates instructors, and to compare their quality of life relative to Brazilian reference values. **Method:** A total of 166 Pilates instructors from Rio Grande do Sul, Brazil (consecutive sampling) with degrees in physical education or physical therapy responded the 36-Item Short-Form Health Survey and Work-related Habits Questionnaire. Statistical analysis included calculation of prevalence ratios (Poisson regression) and the simple t-test. **Results:** About 62% and 63.3% of the participants reported neck and low back pain, respectively. The prevalence of neck (19%) and low back (16%) pain was higher among the participants who reported to feel always stressed regarding psychological pressure. The prevalence of neck pain was 25% higher among the participants who reported to feel always stressed regarding decision making. The prevalence of neck (15%) and low back (13%) pain was higher among the participants who reported not to perform physical activity. The prevalence of low back pain was 26%, 17% and 24% higher among the participants who reported to always perform physical effort, work standing and use computers, respectively. The scores on seven quality of life domains differed significantly between Pilates instructors and the national average. **Conclusion:** Psychological pressure and sedentary lifestyle were associated with neck and low back pain. Physical effort, work standing and computer use were associated with low back pain, and occupational stress with neck pain. Pilates instructors scored lower on seven quality of life domains, the exception being physical functioning.

Keywords | quality of life; musculoskeletal pain; occupational risks.

RESUMO | **Introdução:** A dor tem sido apontada como um problema de saúde pública, podendo gerar impacto negativo na qualidade de vida. **Objetivo:** Avaliar a prevalência de dor musculoesquelética e os fatores ocupacionais associados em instrutores do método pilates e comparar a qualidade de vida desses profissionais com os dados normativos brasileiros. **Método:** Cento e sessenta e seis instrutores de pilates do Rio Grande do Sul (amostra consecutiva), graduados em Educação Física ou Fisioterapia, foram avaliados com o 36-Item Short-Form Health Survey e o Questionário de Hábitos Relacionados ao Trabalho. Realizaram-se razões de prevalência (Regressão de Poisson) e teste t simples. **Resultados:** Sessenta e dois e 63,3% dos instrutores referiram dor cervical e lombar, respectivamente. Aqueles que se sentiam sempre estressados quanto à pressão psicológica apresentaram maior prevalência de dor cervical (19%) e lombar (16%). Instrutores que sempre se sentiam estressados quanto às tomadas de decisão apresentaram 25% maior prevalência de dor cervical. Os que não praticam exercícios físicos possuem maior prevalência de dor cervical (15%) e lombar (13%). Aqueles que referiram sempre realizar esforço físico, trabalhar em pé e sempre utilizar o computador apresentaram 26, 17 e 24% maior prevalência de dor lombar, respectivamente. Houve diferença significativa em sete domínios da qualidade de vida em comparação com a população brasileira. **Conclusão:** A pressão psicológica e o sedentarismo estiveram associados às dores cervical e lombar. O esforço físico, o trabalho em pé e o uso do computador associaram-se com a dor lombar, e o estresse ocupacional, com a dor cervical. Os instrutores apresentaram menores escores de qualidade de vida em sete domínios, exceto na capacidade funcional.

Palavras-chave | qualidade de vida; dor musculoesquelética; riscos ocupacionais.

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INTRODUCTION

According to the World Health Organization (WHO) about 45% of the global population and about of 58% of the population above 10 years old provide the workforce which sustains the economic and material basis of modern societies¹. Productivity demands are often associated with long working hours, repetitive movements and stress, which cause work-related diseases and impair the quality of life (QoL) resulting in absenteeism and reduced productivity²⁻⁵. For instance, musculoskeletal disorders represent more than one third of occupational diseases in the United States, Europe and Japan⁶.

Musculoskeletal disorders and pain are considered a significant public health problem, not only as a function of their high prevalence and incidence, but also of their impact on people and work ability. In addition, they also result in high social and economic costs, and have negative impact on QoL⁷.

Physical activities likely to reduce musculoskeletal pain are currently awakening the overall attention. Pilates, a physical, mental and emotional conditioning method⁸, has been described as a useful tool to reduce low back^{9,10} and neck¹¹ pain, in addition to countless other benefits among different populations¹². Perhaps this is why the number of adepts has increased worldwide⁸, with consequent opening of job opportunities for Pilates instructors.

However, to the best of our knowledge no study sought to investigate aspects related to the health of Pilates instructors, musculoskeletal pain and QoL in particular. Considering their working hours and need to remain standing and perform repetitive movements while supervising clients and adjust springs and equipment, investigating the prevalence of musculoskeletal pain among, and factors associated with the QoL of Pilates instructors is justified. We believe that accurate knowledge of such factors might help ground occupational injury prevention programs, thus not only ensuring the physical health, but also the productivity of this population of workers.

Therefore, the aims of the present study were to analyze the prevalence of musculoskeletal pain and associated occupational factors among Pilates instructors, and to

compare their QoL to that of the Brazilian population. Our hypothesis was that musculoskeletal pain is associated with occupational factors, and that the QoL of Pilates instructors is similar to the national average.

METHOD

The present cross-sectional study was conducted in Rio Grande do Sul, Brazil, and was approved by the corresponding university research ethics committee, CAAE 63611917.1.0000.5347.

The sample size was established through calculation of proportions for an infinite population¹³ based on data located in the literature. Assuming a prevalence of musculoskeletal pain of 55%, 95% confidence level and sample error of 10%, the number of participants had to be 95 at least.

Participants were consecutively recruited. We obtained from Universidade Federal do Rio Grande do Sul (UFRGS) the list of students from all across the state who attended a Pilates specialization course. We thus had access to the e-mail address of 110 Pilates instructors, and sent them invitations to participate in the study. We also asked them to resend the invitation to colleagues, a procedure known as “snowball” sampling. This phase of the study lasted from March through June 2017. We included Pilates instructors with a degree in physical education or physical therapy, from both sexes, and with at least one-year experience in the job. Individuals with history of orthopedic surgery were excluded.

Data collection was performed online via Google Forms. The participants were sent a link to the informed consent form and two questionnaires—36-Item Short Form Health Survey (SF-36) and Work-related Habits Questionnaire (Questionário de Hábitos Relacionados ao Trabalho—QHT). This data collection procedure was necessary to cover the intended demographic area, i.e., the entire state of Rio Grande do Sul.

SF-36¹⁴ assesses QoL based on the respondents' perception of eight domains: physical functioning, physical role functioning, bodily pain, general health, vitality, social role functioning, emotional role functioning and mental health. The score on each

domain ranges from zero (poorest) to 100 (best). Considering the subjective nature of QoL and that SF-36 does not provide cutoff points, we chose the reference values for the same-age Brazilian population⁵ for the purpose of comparison.

QHT¹⁶ collects information on demographic and occupational characteristics, and aspects related to musculoskeletal pain among workers. Questions are distributed across seven sections:

1. demographic;
2. occupational: working hours;
3. occupational: physical, chemical, biological and ergonomic hazards;
4. occupational: stress and workplace;
5. occupational: work-related diseases and accidents;
6. cardiovascular;
7. musculoskeletal.

The musculoskeletal section comprises five questions which investigate the frequency (response options: “always,” “sometimes” or “seldom”) and intensity (response options: “mild,” “moderate” or “strong”) of pain. Both SF-36 and QHT are self-report questionnaires, and have proven validity and reproducibility.

For statistical analysis, the participants were divided in two groups, with or without musculoskeletal pain (for different body sites). Presence of musculoskeletal pain was established based on the question on frequency. The data were subjected to descriptive statistics, and prevalence ratios (PR) were calculated with the corresponding 95% confidence interval (95%CI) to analyze factors associated with musculoskeletal pain. PR were calculated by means of multivariate analysis based on Poisson regression with robust variance. Analysis was performed with software SPSS 18; the significance level was set to 0.05.

RESULTS

A total of 168 individuals responded the questionnaires, but two were excluded for not having a degree in physical therapy or physical education. The recruitment procedure allowed gathering a sample much larger than the calculated minimum, as the invitation to participate reached 33 towns across the state.

The final sample comprised 166 participants, with average age 32 ± 5.6 years old, mainly women (88%); 66.9% ($n=111$) were physical therapists, and 33.1% ($n=55$) physical educators. About 42.8% ($n=71$) of the participants worked exclusively as Pilates instructors, while 57.2% ($n=95$) also had other jobs. About 40% ($n=66$) of the sample had attended undergraduate courses only, 29.1% ($n=48$) were attending and 29.7% ($n=49$) had completed graduate education. The participants' average experience as Pilates instructors was 4 ± 3.0 years; about 19.5% ($n=32$) worked up to 40 hours / week, and 64.5% ($n=107$) worked all three shifts.

The lowest scores on SF-36 corresponded to domains pain, general state of health and vitality. Comparison between Pilates instructors and the national average for the same-age population showed significantly lower scores among the former on seven domains (physical role functioning, pain, general state of health, vitality, social role functioning, emotional role functioning and mental health). The Pilates instructors' scores were higher only on domain physical functioning (Table 1).

In regard to the prevalence of musculoskeletal pain, the neck and lower back were the body sites most frequently affected (Table 2).

The prevalence of neck pain was 25% higher among the participants who reported to feel always stressed regarding decision making. Prevalence was 16 and 19% higher among the participants who reported to feel always stressed regarding supervisors' support and psychological pressure, respectively. The odds to develop neck pain were higher (15%) among the individuals who did not perform physical activity (Table 3).

The prevalence of low back pain was 26% higher among the participants who reported that their job always requires physical effort. Prevalence was 17 and 24% higher among the participants who reported that their occupation always requires to work standing and computer use, respectively. Prevalence was 30% lower among the participants who reported to feel always stressed regarding teamwork, which was unexpected. The prevalence of low back pain was 16% higher among the participants who reported to feel sometimes or always stressed regarding psychological pressure. Prevalence was 13% higher among the participants who did not practice physical activity (Table 4).

DISCUSSION

The prevalence of musculoskeletal pain was high in the analyzed sample of Pilates instructors, 63.3% of the participants reported low back and 62.0% neck pain. Although there is no specific information on the health of Pilates instructors, studies which analyzed physical therapists reported similar findings¹⁷⁻¹⁹. The lower back (69.8%) was the body site most frequently affected among physical therapists in Nigeria, followed by the neck (34.1%). These body sites were also the most frequently affected among physical therapists and occupational therapists in India, who exhibited high prevalence of low back (38.9%) and neck (22.2%) pain¹⁸. The lower back was also the most frequent site of work-related musculoskeletal disorders among physical therapists in Turkey²⁰. One study conducted with physical therapists in South Korea found that 94.5% of the participants reported some work-related musculoskeletal disorder, mainly involving the shoulders, hands and back¹⁷. According to these authors, the reason for this anatomical distribution is that physical therapists remain standing over long periods of time and need to use the upper limbs often¹⁷. Inadequate body posture during work might be considered a relevant cause of musculoskeletal injury and pain among physical therapists¹⁸. All these factors are also a part of the working

conditions of Pilates instructors, who are thus at high risk for development of musculoskeletal pain.

Also studies which approached these conditions among teachers found high prevalence of pain. In one sample of university professors from Goias, Brazil, the prevalence of low back and neck pain was 80.6 and 77.8%, respectively²¹. In another study conducted in the interior of the state of Sao Paulo, Brazil, the prevalence of low back, thoracic and neck pain was 63.1, 62.4 and

Table 2. Absolute (n) and relative (%) frequency of musculoskeletal pain among Pilates instructors, Rio Grande do Sul, Brazil, 2017 (n=166).

Body site	Pain n (%)	No pain n (%)
Head	90 (54.2)	76 (45.8)
Neck	103 (62.0)	63 (37.9)
Thoracic	38 (22.9)	128 (77.1)
Lower back	105 (63.3)	61 (36.8)
Elbows	14 (8.4)	152 (91.6)
Wrists	32 (19.3)	134 (80.7)
Hips	29 (17.5)	137 (82.5)
Knees	59 (35.5)	107 (64.4)
Ankles / feet	32 (19.3)	134 (80.7)

Table 1. Quality of life of Pilates instructors and comparison to the Brazilian average reference values, Rio Grande do Sul, Brazil, 2017 (n=166)

	Mean±SD	Minimum	Maximum	National average*	t test
Physical functioning	91.5±10.7	50.0	100.0	89.7	t=2.080; p=0.039
Physical role functioning	83.8±26.9	0.0	100.0	88.4	t=-2.204; p=0.029
Pain	40.2±7.8	10.0	62.0	86.1	t=-75.220; p<0.001
General state of health	56.8±9.7	17.0	75.0	80.1	t=-30.840; p<0.001
Vitality	60.2±18.5	0.0	100.0	76.9	t=-11.625; p<0.001
Social role functioning	80.0±22.0	0.0	100.0	90.6	t=-6.192; p<0.001
Emotional role functioning	81.0±33.0	0.0	100.0	89.4	t=-3.268; p=0.001
Mental health	72.7±16.3	24.0	100.0	76.9	t=-3.308; p=0.001

SD: standard deviation; *mean Brazilian reference values¹⁵.

59.2%, respectively, which agrees with the rates found in the present study. Differently, in the study by Ceballos and Santos with kindergarten and elementary school

teachers from Recife, Brazil, musculoskeletal pain was most frequently reported in the shoulders (31.6%), upper back (27.8%), neck (27.2%) and ankles and / or

Table 3. Absolute and relative frequency, multivariate association analysis, and prevalence ratio for neck pain (dependent variable) and occupational factors (independent variables) relative to Pilates instructors, Rio Grande do Sul, Brazil, 2017 (n=166).

Occupational factors	Sample n (%)	Neck pain [#] n (%)	χ^2 test	PR (95%CI)
Physical effort (n=162)				
Never	8 (4.9)	4 (50)	0.151	1
Sometimes	111 (68.5)	70 (63.1)		1.13 (0.78-1.64)
Always	43 (26.5)	25 (58.1)		1.02 (0.70-1.50)
Work standing (n=164)				
Never	4 (2.4)	4 (100)	0.245	1
Sometimes	57 (34.8)	35 (61.4)		0.89 (0.58-1.36)
Always	103 (62.8)	63 (61.2)		0.96 (0.63-1.47)
Decision making (n=166)				
Never	40 (24.1)	15 (37.5)	0.006*	1
Sometimes	108 (65.1)	73 (67.6)		1.19 (1.05-1.35)
Always	18 (10.8)	15 (83.3)		1.25 (1.08-1.45)
Teamwork (n=164)				
Never	77 (47.0)	40 (51.9)	<0.001*	1
Sometimes	80 (48.8)	58 (72.5)		1.13 (1.03-1.24)
Always	7 (4.3)	4 (57.1)		0.68 (0.51-0.91)
Supervisors' support (n=161)				
Never	101 (62.7)	58 (57.4)	<0.001*	1
Sometimes	51 (31.7)	33 (64.7)		0.97 (0.88-1.08)
Always	9 (5.6)	9 (100)		1.16 (1.06-1.27)
Psychological pressure (n=163)				
Never	60 (36.8)	29 (51.7)	0.029*	1
Sometimes	87 (53.4)	59 (67.8)		1.11 (1.00-1.23)
Always	16 (9.8)	12 (75.0)		1.19 (1.04-1.35)
Exercise (n=166)				
Yes	136 (81.9)	79 (58.1)	<0.001*	1
No	30 (18.1)	24 (80.0)		1.15 (1.06-1.24)

PR: prevalence ratio; 95%CI: 95% confidence interval; *significant association; #percentage (%) relative to n in column "Sample".

Table 4. Absolute and relative frequency, multivariate association analysis, and prevalence ratio for low back pain (dependent variable) and occupational factors (independent variables) relative to Pilates instructors, Rio Grande do Sul, Brazil, 2017 (n=166).

Occupational factors	Sample n (%)	Low back pain [#] n (%)	χ^2 test	PR (95%CI)
Repetitive movements (n=163)				
Never	21 (12.9)	7 (33.3)	0.142	1
Sometimes	104 (63.8)	66 (63.5)		1.19 (0.99-1.42)
Always	38 (23.3)	29 (76.3)		1.19 (0.99-1.45)
Physical effort (n=162)				
Never	8 (4.9)	5 (62.5)	0.048*	1
Sometimes	111 (68.5)	66 (59.5)		1.12 (0.80-1.57)
Always	43 (26.5)	33 (76.7)		1.26 (0.89-1.77)
Work standing (n=164)				
Never	-	-	0.003*	-
Sometimes	61 (37.2)	35 (57.4)		1
Always	103 (62.8)	70 (68)		1.17 (1.05-1.29)
Focus (n=165)				
Never	7 (4.2)	3 (42.9)	0.061	1
Sometimes	27 (16.4)	20 (74.1)		1.23 (0.93-1.62)
Always	131 (79.4)	82 (62.6)		1.09 (0.83-1.41)
Computer use (n=157)				
Never	80 (51.0)	56 (70)	<0.001*	1
Sometimes	73 (46.5)	39 (53.4)		0.86 (0.79-0.94)
Always	4 (2.5)	4 (100)		1.24 (1.08-1.44)
Decision making (n=166)				
Never	40 (24.1)	24 (60.0)	0.147	1
Sometimes	108 (65.1)	69 (63.9)		1.08 (0.98-1.20)
Always	18 (10.8)	12 (66.7)		0.97 (0.82-1.15)
Teamwork (n=164)				
Never	77 (47.0)	47 (61.0)	0.003*	1
Sometimes	80 (48.8)	52 (65.0)		1.03 (0.95-1.13)
Always	7 (4.3)	4 (57.1)		0.70 (0.56-0.88)
Psychological pressure (n=163)				
Never	60 (36.8)	29 (48.3)	0.013*	1
Sometimes	87 (53.4)	62 (71.3)		1.16 (1.05-1.28)
Always	16 (9.8)	12 (75.0)		1.16 (0.99-1.35)
Exercise (n=166)				
Yes	136 (81.9)	80 (58.8)	0.015*	1
No	30 (18.1)	25 (83.3)		1.13 (1.02-1.25)

PR: prevalence ratio; 95%CI: 95% confidence interval; *significant association; #percentage (%) relative to n in column "Sample".

feet (24.0%)²². While some studies describe different prevalence rates for musculoskeletal complaints, they are usually high, especially in regard to the lower back and neck.

The factors associated with neck pain in the analyzed population of Pilates instructors were: physical effort, long time standing, and stress regarding decision making, teamwork, supervisors' support, psychological pressure and physical activity. In turn, the factors associated with low back pain were: repetitive movements, physical effort, standing, focus, computer use, stress regarding decision making, teamwork, psychological pressure and physical activity. Indeed, factors such as stress regarding decision making, supervisors' support and psychological pressure increased the odds of neck pain by 20%. Low back pain was associated with occupational physical factors, such as physical effort, work standing and computer use, as well as with emotional factors, including stress regarding psychological pressure. All together, these findings allow accepting the hypothesis that underlay the present study, i.e. that musculoskeletal pain among Pilates instructors is associated with occupational factors. However, there was an unexpected result, to wit, that the odds of musculoskeletal pain were 30% lower for the participants who reported to feel always stressed. We cannot provide an explanation for this finding, and thus call the attention to the need to perform further studies to understand better the aspects which influence the health of Pilates instructors.

In a study which analyzed risk factors for musculoskeletal diseases, 83.5% of the interviewees reported that treating a large number of patients in a day was the factor that most contributed to worsen their symptoms¹⁹. In other studies, transferring patients was cited as the main risk factor for musculoskeletal injury among physical therapists²⁰. According to Singh¹⁸, patient transfer is a factor considerably associated with musculoskeletal injury among physical therapists, because they are exposed to spine overload beyond tissue thresholds, even when the body mechanics is adequate. Mierzejewski and Kumar²³ found that patient handling, bending, stooping, lifting, carrying, pushing and pulling were the activities which most commonly triggered symptoms. While belonging to the same professional category, the

activities performed by traditional physical therapists and Pilates instructors are different, in addition to the fact that the latter usually deal with more independent clients, perform less passive exercises, and are seldom required to transport patients. Pilates instructors work standing and perform repetitive movements, have to adjust springs and equipment, and supervise clients, in addition to accomplishing tasks similar to those of traditional physical therapists.

Studies conducted with teachers described several occupational factors associated with musculoskeletal disorders, such as standing and sitting over long periods of time, carrying didactic materials, inadequate furniture, grading tests and assignments, inadequate movements (for instance, neck and trunk bending while grading assignments and providing individual orientation; raising the upper limbs and extending the neck while writing on the blackboard), long weekly working hours, large number of classes, large number of students per class, and insufficient rest time².

Cardoso et al.⁵ described some occupational factors associated with the prevalence of musculoskeletal pain among teachers, including long working hours, years in the job, considerable physical effort, second jobs, and high temperature in the classroom. Baião and Cunha²⁴ analyzed 30 studies and found that illness among teachers was associated with several factors, including long working hours, inadequate body posture, sedentary lifestyle, double shifts, and teaching technique. Among the most frequent conditions, musculoskeletal dysfunction was mentioned in six studies (20%). While these studies addressed a different professional category, their results are similar to the ones obtained in the present study, as there was association of physical effort, work standing and repetitive movements with musculoskeletal pain among the Pilates instructors. These finding indicate that a high workload while maintaining the same body posture over a long period of time and performing repetitive movements might be associated with musculoskeletal pain also in this population of workers.

Sedentary lifestyle was associated with both neck and low back pain. The prevalence of neck and low back pain was 15 and 13% higher, respectively, among the participants who reported not to perform physical

activity. This finding was expected, as the health effects of regular physical activity are well known. Low back pain has been associated with sedentary lifestyle; physical activity has been recommended for both prevention and rehabilitation²⁵. Making regular physical activity become a habit within the context of prevention of pain syndromes is no new idea²⁶. Nevertheless, about 60% of the Brazilian population did not perform any type of physical activity, and half of the global population was physically inactive in 2001²⁵. Corroborating these data, a study performed in Petrolina, Pernambuco, and Juazeiro, Bahia, Brazil, which analyzed physical activity among health professionals allocated to intensive care units, found that only 44% of the sample was physically active²⁷.

Therefore, encouraging physical activity might represent a strategy to lessen a considerable public health problem. According to Ribeiro et al.², musculoskeletal pain affects a significant part of individuals in different professional categories, and results in high social and economic costs due to its negative impact on QoL. In addition, low back pain is the most frequent cause of incapacity for work among individuals under 45 years old in the United States, with a cost of about USD 20 billions in the 1970s, and estimated cost of USD 50 billions in the present decade²⁸.

In regard to QoL assessment, SF-36 domain pain exhibited the lowest score (40.2 ± 7.8), followed by general state of health (56.8 ± 9.7) and vitality (60.2 ± 18.5). In a study with physical therapy professors, also domains vitality (67.5 ± 14.7) and pain (76.7 ± 20.1) received the lowest scores²⁹. Similarly, in the study by Sangalli et al.³⁰ with physical therapists from Taquari Valley, Brazil, also domains pain (69.7 ± 19.9) and vitality (64.6 ± 17.4) exhibited the lowest scores. Our results might be accounted for by the high prevalence of musculoskeletal pain among the analyzed sample. As is known, work-related pain is frequent among physical therapists, who nonetheless remain in their job even when symptoms interfere with their work and QoL^{30,31}. Pain occurs among physical therapists independently from their specific tasks, e.g. Pilates instructors, professors^{29,32} or neurology specialists³³.

Comparison of the QoL scores of the Pilates instructors to the national average showed that they scored lower

in seven of eight domains, which indicates that their QoL is poorer compared to the average Brazilian population. This finding was unexpected, as our initial hypothesis was that the QoL scores of Pilates instructors would not differ from the national average. This finding raises a concern in regard to the physical and emotional health of this population of workers. Also other studies reported lower QoL scores among physical therapists. Sangalli et al.³⁰ obtained scores below the national average for five domains (pain, vitality, mental health, social role functioning and emotional role functioning). Leandro et al.³⁴ found lower QoL scores in all SF-36 domains among physical therapy professors.

A possible explanation for such low QoL scores might be the fact that the working hours are long and the salary is low among Pilates instructors. About 52.7% of the participants in the present study had other jobs, and 64.5% worked all three shifts. These findings corroborate those of other studies conducted with physical therapists³⁵, physical educators³⁶ and teachers in other fields of interest^{4,37}, all of whom had more than one job and reported long working hours. A study which analyzed health professionals at an intensive care unit found that their weekly working hours exceeded the established time, being 65.3 hours, on average, for the physical therapists²⁷. Bae and Min¹⁷ found that physical therapists with some work-related disorder worked 42 hours / week, which is indicative of work overload. These data corroborate the results of the present study. A possible explanation for such long working hours might be the low salary paid to Pilates instructors.

Only the score on domain physical functioning (mean: 91.5) was higher among Pilates instructors compared to the national average. Similar results were obtained in a study with physical therapy professors, in which the average score was 91.5, thus indicative of satisfactory QoL²⁸. The same was the case in the study by Sangalli et al.³⁰, with an average score of 97.6, while 77.5% of the participants scored 100 on this domain. Assuming that domain physical functioning investigates an individual's ability to perform activities of daily living—which range from vigorous—intensity to common activities, such as bathing and dressing—the high scores obtained in the present study are not difficult to understand: the sample comprised professionally active individuals whose

occupation—Pilates teaching—demands a minimum of physical fitness.

The length in the job (4 ± 3.0 years) reported by the participants cannot be rated long. The reason might be that Pilates consolidated in the 2000s³⁸, and thus is relatively recent in Brazil. However, although young (32 ± 5.6 years old) and with short experience as Pilates instructors, the prevalence of neck and low back pain was high among the participants. These findings corroborate reports in the literature according to which work-related low back pain often begins within the first five years of work in physical therapy and before age 30 years old²³. Physical therapists with more than 15 years of work in the profession reported higher levels of satisfaction compared to those with shorter length in the job³⁹.

As limitation of the present study, we might mention the resource to consecutive sampling, which was necessary to overcome difficulties in recruitment, as it was not possible to identify all the professionals who work as Pilates instructors in the targeted area to then recruit a random sample.

CONCLUSION

The present study analyzed the occurrence of musculoskeletal pain among Pilates instructors in Rio Grande do Sul. The prevalence of pain was highest for the lower back (63.3%) and neck (62.0%).

The prevalence of neck and low back pain was 19 and 16%, respectively, among the participants who reported to feel sometimes or always stressed due to psychological pressure. The odds to exhibit neck pain were 25% higher for the participants who reported pressure regarding decision making.

The prevalence of neck and low back pain was 15 and 13%, respectively, among the participants who did not exercise on a regular basis. The prevalence of low back pain was 26, 17 and 24% higher among the participants who reported to always perform physical effort at work, work standing and use computers, respectively.

The QoL scores of the Pilates instructors were lower in seven domains (physical role functioning, pain, general state of health, vitality, social role functioning, emotional role functioning and mental health) compared to the national average. Pilates instructors only scored higher on domain physical functioning.

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