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Research Article

Pain in Brazilian Healthcare Professionals during the COVID-19 Pandemic

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Abstract

Health professionals are susceptible for physical and mental illness secondary to the pandemic of COVID-19. The present study aimed to evaluate the presence of pain, its intensity and impact on daily life in health professionals, in addition to its relationship with sleep and physical activity during the COVID-19 pandemic. This is an observational and cross-sectional study collected through a questionnaire sent by Google Forms to healthcare professionals across the Brazilian territory. The volunteers answered the Brief Pain Inventory and questions about the suspension or reduction of physical activity, the presence of initial insomnia and its qualitative gradation attributed by the interviewer between mild, moderate, severe and very severe. It was observed that 41.1% of the participants reported pain different from those commonly presented during their lifetime and that the frequency of drug treatment (29.2%) was higher than that of non-medication treatment (21.8%). We observed a higher prevalence of pain in individuals who classified their initial insomnia as severe or very severe and in those who interrupted physical activity during the pandemic. Thus, stimulating physical activity, adjusting sleep, psychological support, personal protective equipment that values safety and comfort and continuing education related to the care of health professionals are essential.

Keywords: *Pain; Health Professionals; COVID-19*

Introduction

Pneumonia caused by coronavirus 2019 (COVID-19), also called severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), was first described in Wuhan [1], a city in southern China, spread nationally and internationally and led the declaration of pandemic status by the World Health Organization (WHO) on March 11, 2020, after the registration of more than 118 thousand cases of SARS-CoV-2 and 4,292 deaths worldwide [2].

Health professionals are particularly susceptible to infection and face many difficulties, such as exposure to the risk of contamination, direct exposure to patients with a high viral load, physical exhaustion, rigid reorganization of workplaces, management of material shortages, extremely high number of deaths among patients, colleagues or family members, as well as ethical issues related to decision making in a stressed health system [3].

The World Health Organization (WHO) recognizes chronic pain as a public health problem worldwide. Some factors can contribute to an increased risk of chronic pain (female gender, advanced age, lower socioeconomic status or geographic, cultural and genetic origin [4]. A systematic review described growing evidence that the prevalence of chronic pain in the general population is high internationally (34% in low- income countries and 30% in high-income countries) [5].

For many years, the choice of treatment for chronic pain included recommendations for rest and inactivity. However, since the 1980s, the primary care physician's advice for pain management has changed, starting to guide the individual with pain to remain active [6]. Scottish Intercollegiate Guideline Network (SIGN) 2013 guidelines on the treatment of chronic pain made strong recommendations on the use of exercise, based on evidence from randomized clinical trials, stating: "exercise and exercise therapies, regardless of their form, are recommended in the management of patients with chronic pain" [7].

Aim of the Study

Thus, this study aimed to assess the presence of pain, its intensity and impact on daily life in health professionals, in addition to its relationship with sleep and physical activity during the COVID-19 pandemic.

Methodology

This is an observational and cross-sectional study collected during the peak of the COVID-19 pandemic in Brazil, through a questionnaire sent by Google Forms platform to healthcare professionals across the Brazilian territory. This is an observational and cross-sectional study collected during the peak of the COVID-19 pandemic in Brazil, through a questionnaire sent by google forms to healthcare professionals across the Brazilian territory. The volunteers responded to the Brief Pain Inventory (BPI) [8], a scale validated for the Portuguese language in Brazil, in addition to questions about the suspension or reduction of physical activity, the presence of initial insomnia and its qualitative gradation attributed by itself interviewer between mild, moderate and severe and very severe. The research was approved by the National Ethics and Research Commission with opinion 4,157,408.

Data analysis

The data were tabulated in a digital spreadsheet and analyzed statistically. Descriptive analysis was performed using measures of frequency, absolute and relative, and measures of central tendency, mean and standard deviation. Inferential analysis was also performed using the hypothesis test for proportions, in order to observe the proportion of the frequency of responses to the questionnaire items. The statistical software R, version 3.6.2 was used, and the significance was set at 5% (0.05).

Results

The sample consisted of 710 respondents, mostly women (n = 574; 80.8%), between 30 and 40 years of age (n = 331; 46.6%). Health professionals from different backgrounds, mainly doctors (n = 297; 41.8%), nurses (n = 96; 13.5%), physical therapists (n = 79; 11.1%) and nursing technicians (n = 73; 10.3%) from all regions of Brazil answered the survey. The field of work activity included wards (n = 123; 17.3%), intensive care units (n = 97; 13.7%), outpatient clinics (n = 92; 13.0%), private clinics (n = 90; 12.7%), hospital emergency units (n = 62; 8.7%), non-hospital emergency units (UPAs/Unidades de Pronto Atendimento) (n = 48; 6.8%), family health units (n = 48; 6, 8%), surgical block (n = 36; 5.1%), medical teleconsultation (n = 26; 3.7%), among others.

Table 1 and 2 contain information about the occurrence and treatment related to pain in healthcare professionals during the Covid-19 pandemic.

Regarding the application of the BPI scale, an average value of 3.30 (± 2.31) was reported for the level of pain, considering a scale from 0 to 10, where 0 means "without pain" and 10 means "Worst pain imaginable". In addition, professionals reported a level of 3.47 (± 2.97) for the worst pain they have ever experienced (Table 1).

On a scale of 0 to 10, 0 meaning no pain and 10 meaning the worst pain you can imagine, in the last 24 hours	Average	Standard deviation	Minimum	Maximum
Which number best describes the worst pain you felt?	3,47	2,97	0	10
Which number best describes the weakest pain?	1,83	2,31	0	10
Which number best describes the average of your pain?	3,30	2,71	0	10
How is your pain today?	2,42	2,72	0	10
How intense is the improvement provided by the treatments or medications you are using?	3,48	3,54	0	10
How much did the pain interfere with your general activities?	2,84	3,13	0	10
How much did the pain interfere with your mood?	3,35	3,41	0	10
How much did the pain interfere with your ability to walk?	1,87	2,86	0	10
How much did the pain interfere with your work?	2,72	3,17	0	10
How much did the pain interfere with relationships with other people?	2,55	3,04	0	10
How much did the pain interfere with your sleep?	3,07	3,43	0	10
How much did the pain interfere with the ability to enjoy life?	2,92	3,45	0	10

Table 1: *Self-assessment of pain in health professionals directly and indirectly involved in the treatment of patients diagnosed by SARS-CoV-2, using a 10-point scale.*

Variable	n	%
During life, most people experience pain from time to time (headache, toothache, etc.). Did you have pain different from that today?		
No	418	58,9
Yes	292	41,1
You are currently undergoing drug treatment for pain relief?		
No	477	67,2
Yes	207	29,2
You are currently undergoing NON-drug treatment for pain relief		
No	521	73,4
Yes	155	21,8

Table 2: *Data related to the occurrence and treatment of pain during the pandemic, in health professionals directly and indirectly involved in the treatment of patients diagnosed by SARS-CoV-2.*

The pain interfered mainly in the participants' mood and sleep, with levels of 3.35 (± 3.41) and 3.07 (± 3.43) respectively, on the scale. They reported a pain improvement level of 3.48 (± 3.54) after the treatments performed (Table 1 and 2).

There was an association between pain and insomnia. Most of the time, when the participants report problems with severe or very

Variable	Difficulty initiating sleep										
	Mild		Moderate		Severe		Very Severe		None		p-value
	n	%	n	%	n	%	n	%	n	%	
During life, most people experience pain from time to time. Did you have pain different from that today?											0,0001*
No	134	63,8%	111	51,6%	26	38,2%	15	44,1%	132	72,1%	
Yes	76	36,2%	104	48,4%	42	61,8%	19	55,9%	51	27,9%	
Are you undergoing any drug treatment for pain relief?											
No	159	75,7%	127	59,1%	37	54,4	22	64,7%	158	86,4%	0,0001
Yes	51	24,3%	88	40,9%	31	45,6%	12	35,3%	25	13,7%	
Are you undergoing any non-drug treatment for pain relief?											
No	163	76,6%	155	72,1%	51	75,0%	25	73,5	161	88,0%	0,0001
Yes	47	22,4%	60	27,9%	17	25,0%	9	26,5%	22	12,0%	

Table 3: *Relationship between pain and insomnia in health professionals during the pandemic period. Pearson's Chi-square test; significance * p < 0.05.*

severe sleep. It was observed that most individuals are not undergoing treatment for pain regardless of the degree of difficulty in sleeping, but when there is treatment, most are on medication (Table 3).

An association was observed between the occurrence of pain and sleep disorders. The frequency of difficulty sleeping/insomnia self-

	Difficulty initiating sleep				p-value	
	Mild	Moderate	Severe	Very Severe	None	
Which number best describes the worst pain you felt?						
None	93 (50,8%)	81 (38,5%)	46 (21,4%)	12 (17,7%)	8 (23,5%)	
Light	53 (29,0%)	71 (33,8%)	67 (31,2%)	15 (22,1%)	9 (26,5%)	
Moderate	30 (16,4%)	49 (23,3%)	69 (32,1%)	23 (33,8%)	6 (17,6%)	
Severe	7 (3,8%)	9 (4,3%)	33 (15,3%)	18 (26,5%)	11 (32,4%)	0,0001
Which number best describes the weakest pain?						
None	114 (62,2%)	112 (53,3%)	71 (33,1%)	17 (25,0%)	12 (35,3%)	
Light	61 (33,3%)	79 (37,6%)	106 (49,3%)	36 (52,9%)	15 (44,1%)	
Moderate	4 (2,2%)	12 (5,7%)	27 (12,6%)	12 (17,6%)	3 (8,8%)	
Severe	4 (2,2%)	7 (3,3%)	11 (5,1%)	3 (4,4%)	4 (11,8%)	0,0001
How is your pain today?						
None	112 (61,2%)	113 (53,8%)	69 (32,1%)	18 (26,4%)	9 (26,5%)	
Light	52 (28,4%)	71 (33,8%)	80 (37,2%)	18 (26,5%)	14 (41,2%)	
Moderate	14 (7,7%)	22 (10,5%)	44 (20,5%)	23 (33,8%)	5 (14,7%)	0,0001
Severe	5 (2,7%)	4 (1,9%)	22 (10,2%)	9 (13,2%)	6 (17,6%)	

How intense is the improvement provided by the treatments or medications you are using?						
None	57,7 (77,1)	123 (58,6%)	79 (36,7%)	31 (45,5%)	15 (44,1%)	0,0001
Light	15 (8,2%)	24 (11,4%)	38 (17,7%)	8 (11,8%)	8 (23,5%)	
Moderate	7 (3,8%)	35 (16,7%)	55 (25,6%)	19 (27,9%)	9 (26,5%)	
Severe	20 (10,9%)	28 (13,3%)	43 (20,0%)	10 (14,7%)	2 (5,9%)	
How much did the pain interfere with your general activities?						
None	127 (69,4%)	121 (57,6%)	79 (33,4%)	17 (25,0%)	10 (29,4%)	0,0001
Light	33 (18,0%)	46 (21,9%)	67 (31,2%)	16 (23,5%)	9 (26,5%)	
Moderate	15 (8,2%)	27(12,9%)	51 (23,7%)	23 (33,8%)	5 (14,7%)	
Severe	8 (4,4%)	16 (7,6%)	25 (11,6%)	12 (17,6%)	10 (29,4%)	
How much did the pain interfere with your mood?						
None	121 (66,2%)	109 (51,9%)	62 (28,9%)	15 (22,0%)	8 (23,5%)	0,0001
Light	38 (20,8%)	53 (25,2%)	54 (25,1%)	15 (22,1%)	5 (14,7%)	
Moderate	15 (8,2%)	28 (13,3%)	58 (27,0%)	20 (29,4%)	7 (20,6%)	
Severe	9 (4,9%)	20 (9,5%)	41 (19,1%)	18 (26,5%)	14 (41,2%)	
How much did the pain interfere with your ability to walk?						
None	151 (82,5%)	151 (71,9%)	112 (52,0%)	30 (36,3%)	16 (47,1%)	0,0001
Light	18 (9,8%)	38 (18,1%)	50 (23,3%)	15 (22,1%)	9 (26,5%)	
Moderate	4 (2,2%)	12 (5,7%)	33 (15,3%)	16 (23,5%)	5 (14,7%)	
Severe	10 (5,5%)	9 (4,3%)	20 (9,3%)	7 (10,3%)	4 (11,8%)	
How much did the pain interfere with your work?						
None	134 (73,2%)	122 (58,1%)	77 (35,8%)	20 (29,4%)	11 (32,3%)	0,0001
Light	34 (18,6%)	54 (25,7%)	58 (27,0%)	18 (26,5%)	7 (20,6%)	
Moderate	7 (3,8%)	19 (9,0%)	49 (22,8%)	21 (30,9%)	6 (17,6%)	
Severe	8 (4,4%)	15 (7,1%)	31 (14,4%)	9 (13,2%)	10 (29,4%)	
How much did the pain interfere with relationships with other people?						
None	136 (74,3%)	126 (60,0%)	79 (36,7%)	21 (30,9%)	10 (29,4%)	0,0001
Light	31 (16,9%)	49 (23,3%)	61 (28,4%)	18 (26,5%)	3 (8,8%)	
Moderate	9 (4,9%)	24 (11,4%)	49 (22,8%)	24 (35,3%)	11 (32,4%)	
Severe	7 (3,8%)	11 (5,2%)	26 (12,1%)	5 (7,4%)	10 (29,4%)	
How much did the pain interfere with your sleep?						
None	145 (79,2%)	125 (59,5%)	63 (29,3%)	17 (25,0%)	9 (26,4%)	
Light	22 (12,0%)	54 (25,7%)	48 (22,3%)	10 (14,7%)	4 (11,8%)	
Moderate	13 (7,1%)	16 (7,6%)	53 (24,7%)	17 (25,0%)	6 (17,6%)	
Severe	3 (1,6%)	15 (7,1%)	51 (23,7%)	24 (35,3%)	15 (44,1%)	
How much did the pain interfere with the ability to enjoy life?						
None	137 (74,9%)	132 (62,8%)	78 (36,2%)	21 (30,9%)	8 (10,2%)	0,0001
Light	27 (14,8%)	41 (19,5%)	48 (22,3%)	8 (11,8%)	5 (14,7%)	
Moderate	7 (3,8%)	20 (9,5%)	46 (21,4%)	19 (27,9%)	8 (23,5%)	
Severe	12 (6,6%)	17 (8,1%)	43 (20,0%)	20 (29,4%)	13 (38,2%)	

Table 4: *Relationship between pain scale and difficulty falling asleep/insomnia in health professionals during the pandemic period.*

reported as severe or very severe was associated with the frequency of pain in most of its dimensions. Meanwhile, individuals who did not report any problems sleeping, also did not report pain (Table 4).

It was also observed that the occurrence of pain significantly interfered with general activities, sleep and the ability to appreciate the lives of individuals when there was a change in the performance of physical activities (Table 5). The classification contained in the table

Change in Physical Activities									
		Não				Sim			p-value
	None	Mild	Moderate	Severe	None	Mild	Moderate	Severe	
Which number best describes the worst pain you felt?	39 (30,2%)	46 (35,7%)	32 (24,8%)	12 (9,3%)	201 (34,6%)	169 (29,1%)	145 (25,0%)	66 (11,4%)	0,147
Which number best describes the weakest pain?	59 (45,8%)	47 (36,4%)	16 (12,4%)	7 (5,4%)	267 (46,0%)	250 (43,0%)	42 (7,2%)	22 (3,8%)	0,088
Which number best describes the average of your pain?	41 (31,8%)	40 (31,0%)	39 (30,2%)	9 (7,0%)	187 (32,2%)	199 (34,3%)	159 (27,4%)	36 (6,2%)	0,211
How is your pain today?	56 (43,5%)	45 (34,9%)	20 (15,5%)	8 (6,2%)	265 (46,2%)	190 (32,7%)	88 (15,1%)	38 (6,5%)	0,521
How intense is the improvement provided by the treatments or medications you are using?	75 (58,1%)	12 (9,3%)	22 (17,1%)	20 (15,5%)	314 (54,1%)	81 (13,9%)	103 (17,7%)	83 (14,3%)	0,262
How much did the pain interfere with your general activities?	68 (52,7%)	22 (17,1%)	25 (19,4%)	14 (10,9%)	279 (48,0%)	149 (25,6%)	96 (16,5%)	57 (9,8%)	0,014*
How much did the pain interfere with your mood?	60 (48,5%)	25 (19,4%)	23 (17,8%)	21 (16,3%)	255 (43,9%)	140 (24,1%)	105 (18,1%)	81 (13,9%)	0,093
How much did the pain interfere with your ability to walk?	90 (69,8%)	21 (16,3%)	11 (8,5%)	7 (5,4%)	370 (63,7%)	109 (18,8%)	59 (10,2%)	43 (7,4%)	0,076
How much did the pain interfere with your work?	67 (52,0%)	33 (25,6%)	18 (14,0%)	11 (8,5%)	297 (51,1%)	138 (23,8%)	84 (14,5%)	62 (10,7%)	0,273
How much did the pain interfere with relationships with other people?	66 (51,2%)	33 (25,6%)	20 (15,5%)	10 (7,8%)	306 (52,7%)	129 (22,2%)	97 (16,7%)	49 (8,4%)	0,137
How much did the pain interfere with your sleep?	68 (52,7%)	23 (17,8%)	24 (18,6%)	14 (10,9%)	291 (50,1%)	115 (19,8%)	81 (13,9%)	94 (16,2%)	0,017*
How much did the pain interfere with the ability to enjoy life?	73 (56,6%)	19 (14,7%)	20 (15,5%)	17 (13,2%)	303 (52,1%)	110 (18,9%)	80 (13,8%)	88 (15,1%)	0,024*

Table 5: *Relationship between pain scale and changes in physical activity among health professionals during the pandemic period.*

of the worst pain reported by the patient in BPI as mild, moderate or severe follows the validation guidelines for this scale in Brazilian Portuguese (8) whose cutoff points were 1 to 4 for mild pain, 5 to 7 for moderate pain and 8 to 10 for severe pain.

Discussion

More than 40% of health professionals reported pain on the day of filling the BPI. Probably if we evaluated a longer period, we would have a higher percentage of health professionals with pain complaints.

Among the professionals who reported the presence of pain, 63.6% reported some interference in mood; 66% in labor activity; 54.6% in the relationship with other people; 56.7 in sleep quality; 40.3% in the ability to walk; 53.9% in the ability to enjoy life and 58.3% in their general activities.

As we know, the pathophysiology of pain is intrinsically related to mood disorders, in this study, interference in mood was the complaint with the greatest relevance. Pain comorbid with major depressive disorder is frequent and can lead to impaired functioning, lower treatment response, and limited treatment options. The two conditions often co-occur, exacerbate one another, and may display overlapping symptoms [8]. Up this date, studies have shown considerable overlap between pain and depression-induced neurobiological mechanisms For example, injuries to sensory pathways have been shown to share the same brain regions that are involved in mood management [9].

This study demonstrated that health professionals who suspended or reduced their usual physical activities were in pain at the time of completing the survey with $p < 0.05$. In addition, the greater intensity of pain was correlated with a greater interference in activities of general life, in the ability to enjoy life and in sleep, all with statistical significance ($p < 0.05$). It was also noted that drug treatment was carried out more frequently than non-drug therapies.

This finding is consistent with a review of current issues in chronic pain management that strongly suggests that health professionals traditionally focus on biomedical views of pain, using pharmacology first, and sometimes not addressing potential non-pharmacological approaches, such as physical activity and changing attitudes towards chronic pain [10]. The reduction in physical function and the consequent lack of mobility in people with chronic pain is associated with increased cardiovascular mortality [11].

Among the 906 health professionals from five large hospitals in India and Singapore, involved in the care of COVID-19 patients, 287 (32.3%) reported headache, which is the most common physical symptom followed by a sore throat [12]. This study reported a significant association between physical symptoms and psychological distress. Increased prevalence of headache was also related to the use of personal protective equipment [13]. The use of goggles and a face mask for more than 4 hours increased the likelihood of headache, in addition to aggravating the frequency and intensity of preexisting headaches among survey respondents [13].

Thus, headache has been frequently reported among health professionals during the COVID-19 pandemic, factors such as psychological distress and personal protective equipment that do not hold on to comfort seem to work as a trigger [12,13].

Exercise can have specific benefits in reducing the severity of chronic pain, as well as more general benefits associated with improving general physical and mental health and physical functioning [14]. Interventions can promote the personal involvement of individuals in managing their pain, thus increasing self-efficacy and the capacity for self-management of pain. In turn, it would lead to an increase in the overall quality of life and a consequent reduction in the use of health care. In addition, exercise is of great importance for cardiovascular health [15] and bone health [16].

The association between pain and insomnia was statistically significant, with the presence of severe and very severe insomnia in professionals with pain complaints. The intensity of pain and the influences related to activities of daily living, work, mood, human relationships and the ability to enjoy life were related to the greater severity of initial insomnia ($p < 0.05$).

Normally, this professional, cognitive and emotional burden is balanced by personal life, but, in the context of the COVID-19 pandemic, it becomes even more tense with confinement, concern for loved ones, reduced leisure time and rest [3]. A cross-sectional survey conducted among nurses, concluded that these psychosocial risk factors related to work and mental health problems, especially somatic symptoms of stress, have an important impact on the occurrence of musculoskeletal pain [17].

Conclusion

The emergence of pain complaints during the COVID-19 pandemic in health professionals has been frequently reported, with an important correlation with the reduction or suspension of physical activities performed before the pandemic and with an impact on the presence and severity of insomnia.

Thus, stimulating physical activity, adjusting sleep, psychological support, personal protective equipment use prescribed for safety and comfort, in addition to continuing education related to the care of health professionals are essential in the quality of life of the great heroes of the pandemic.

Conflict of Interest

We don´t have conflict of interest.

Authors' Contributions

Gilberto Diniz de Oliveira Sobrinho: Formal analysis, visualization, writing-original draft, writing-review and editing.

Isabella Araujo Mota Fernandes: Conceptualization, investigation, methodology, project administration, visualization, writing-original draft, writing-review and editing.

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