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Body self-awareness and pain complaints in university music students

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ABSTRACT

Introduction: Pain complaints and musculoskeletal problems are prevalent in musicians. These conditions have physical, cognitive, organizational, and body self-awareness issues as determining factors, which may arise already during university education. **Objective:** To investigate body self-awareness and its relationship with pain complaints in university music students. **Methods:** Cross-sectional study conducted in 2019 with 34 music students from a public university located in the south of the state of Ceará, Brazil. The Battery of Evaluation of Body Self-awareness and Ergonomic Health in Musicians was used, consisting of the scales: self-awareness (A), self-perception of pain (B) preventive aspects (C). A questionnaire with data on curricular musical performance was also applied. Descriptive analyzes and Mann-Whitney and Kruskal-Wallis tests were performed. **Results:** There were pain complaints in 67.6% of the students and low expressiveness of body self-awareness in 50%. There were negative associations: body self-awareness and musculoskeletal problems (p=0.04); self-perception of pain and pain complaints after seven days (p=0.004) and post-performance pain (p=0.03); preventive aspects and pain in the last seven days (p=0.01). There were also positive associations: body self-awareness and the absence of musculoskeletal problems (p=0.004); preventive aspects and the performance of stretching in the routine of musical practice (p=0.04). There were no variables positively associated with self-perceived pain. **Conclusion:** The study contributed to important reflections about musculoskeletal complaints among students and highlighted aspects of instrumental practice that may assist in the development of preventive strategies that promote healthy habits in the university context, with an emphasis on body self-awareness.

Keywords: Public Health; Occupational Health; Health Promotion; Ergonomics; musculoskeletal pain.

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INTRODUCTION

The work activity, each with its specificity, can expose the individual to risks that result in illness. Such risks have various effects on health and can be classified as biological, chemical, physical, ergonomic, psychosocial, and accident-related, among others[1].

For example, assuming unnatural positions, and performing repetitive actions, among other behaviors that do not respect the limits of the body structures, have the potential to cause the so-called Work-Related Musculoskeletal Disorders (WMSDs) and music de professionals are a vulnerable group in this regard[2]. Processes that require consecutive attempts to perform can trigger pain manifestations and result in Cumulative Trauma Disorders (CTD), affecting the soft parts of the skeletal muscles in which inflammatory processes slowly settle[3].

A study conducted in Poland points out musculoskeletal problems as highly relevant among musicians, requiring concern[4]. In Brazil, evaluating the main musculoskeletal complaints among music students and professionals in the ABC region of São Paulo, it was observed that, regardless of the type of instrument used (string, percussion, or wind instrument), the pain was a symptom mentioned by half or more of the participants, especially in the regions of the hands and dorsal and lumbar columns, and less than half of them had any medical follow-up in this regard[5].

Based on the updated International Association for the Study of Pain (IASP), the Brazilian Society for the Study of Pain[6] defines it as *"an unpleasant sensory and emotional experience associated with actual or potential tissue injury, or described in terms of such injury"*. However, the pain symptom is not the only complaint that pervades the musical practice: discomfort, fatigue, paresthesia, muscle weakness, and joint and neural problems are other problems that may arise in various locations[4,7,8]. Among the factors involved in the appearance of such complaints among instrumentalists are mechanical factors that may mean neuromusculoskeletal overload[2], psychological factors[9,] and issues involving body self-awareness[10].

The concept of body self-awareness is multifaceted, and it can be formulated as a set of perceptions that an individual has about his/her body biomechanics, involving motor, tactile, and kinesthetic aspects[10-12]. In this sense, *"to have self-awareness is to have the ability to represent oneself as a material, or physical object"*[13]. When it comes to musical practice, body self-awareness plays the role of promoting a critical look at oneself and may have repercussions on adjustments to harmful habits[10].

Thus, research has been conducted focusing on demonstrating cumulative traumatic disorders in music professionals at different levels (amateurs to professionals). In the case of entry into higher education, for example, the natural increase of time dedicated to the practice of music students associated with the lack of guidance in the educational environment regarding the physical and psychological burden resulting from this results in an increased risk of injury[14].

Considering the importance of the topic and valuing the potential role of the university in the promotion of health education, the present study was carried out to contribute to the description of the illness process of future instrumentalists, to favor preventive and early interventions.

In this sense, this study aimed to investigate body self-awareness and its relation to the emergence of pain complaints in college music students.

METHODS

This is a cross-sectional study conducted in a course of Music in a public institution of higher education located in the south of the state of Ceará, Brazil. Analyzing the Pedagogical Project of the course, it was found that it is a course with annual admission of new students and the curricular organization is divided into three axes: basic, specific, and theoretical-practical contents, distributed over eight semesters. In the first semester, introductory subjects are offered, and in the second, the students choose the definitive instrument for the execution of the remaining contents until the conclusion of the course, which has an integrating time of a minimum of four years and a maximum of six years. It was not identified, in the syllabus, like any discipline related to body self-awareness and/or musician's health.

The study population consisted of college students regularly enrolled in the third period of the course. These students were chosen because it was the academic period immediately following the choice of the main instrument. In this sense, it was ensured that all participants handled, for at least one semester, some musical instruments during the curricular activities, which lasted four hours/week, totaling 64 hours of musical practice, regardless of the instrument chosen.

At the time of data collection, 35 students were regularly attending the period of interest of the study, who were invited to participate in the research. One student refused to participate, and the sample was composed of all those who accepted.

As research instruments, it was used a questionnaire of sociodemographic data, health and instrumental practice, and a Likert-type scale containing the items of the Battery of Evaluation of Body Self-awareness and Ergonomic Health in Musicians[10], composed of 46 items, which investigates body self-perception, pain perception, and preventive aspects. It consists of three scales, called Body Self-Awareness (Scale A), with 16 items; Self-Perception of Pain and Performance (Scale B), with eight items, and Preventive Aspects (Scale C), with 22 items. Each scale presents the frequency options about the themes, ranging from 1 - never, to 5 - always.

Scale A is further subdivided into two dimensions: the first corresponds to pain perception related to emotional and cognitive aspects and the second to the relationship between performance and postural self-awareness in musical practice. Scale B is unidimensional, and Scale C has subdivided into five dimensions: 1) preventive preparation; 2) health professional accompaniment; 3) care for the environment; 4) physical activity practices, and 5) quality of sleep and diet.

After obtaining permission from the course coordinator and the professor teaching the class on the day and time of data collection, the instruments were applied in a single session after the participants had agreed and signed the informed consent form.

The data obtained were entered into the Libre Office Calc program, version 6.4.6, and exported for analysis in the IBM SPSS statistical program, version 23.0, through simple

frequencies of the independent and outcome variables, as well as the correlation between them using the Mann-Whitney and Kruskal-Wallis U tests, given the non-normality verified in the Kolmogorov-Smirnov test. Chi-square and Fisher's Exact tests were used to verify the association between the study variables. To verify the expressiveness of body self-awareness, the sum of responses per scale was converted into dichotomous responses labeled as high and low, from the values above or below the calculated medians. For all tests, those with $p<0.05$ were considered statistically significant.

This research is part of the project entitled "Studies on health promotion and health behavior of university music groups", which was approved by the institutional Research Ethics Committee, process 2,844,275.

RESULTS

Thirty-four college students participated in the study, 70.6% being male, with ages ranging from 18 to 47 years (mean 23.68±6.59). Most of them (52.9%) reported dedicating themselves to university study full-time and 11.8% reported practicing music as a paid activity. As for musical practice, 67.6% reported using string instruments, and 47.1% reported dedicating four to eight hours a week to musical practice. Pain complaints in the last seven days were reported by 67.6% of the respondents (Table 1).

Regarding body self-awareness (Table 2), globally, 50% of the students presented high expressiveness. The scale that presented the highest percentage of individuals with high expressiveness was Scale A, with 55.9% of the sample, followed by Scale B, with 52.9%. Among those who presented high expressiveness, the majority (58.8%) were students who had a paid activity in their free time, while low expressiveness was more frequent among students dedicated exclusively to university education (70.6%).

Data regarding the variables health and instrumental practice and their association with the dimensions of Scales A and B are presented in Table 3. The descriptive analysis showed that the terms "ergonomics" and "CTD" have unknown meanings to the students (73.5% and 64.7% respectively), as well as the preventive methods against diseases related to the musician's work (61.8%).

The absence of musculoskeletal problems was associated with postural perception (p=0.009), while pain symptoms manifested in the seven days before data collection, and painful episodes that occurred after musical practice was associated with the perception of this condition (p=0.004 and p=0.03 respectively). The emotional aspects involved in pain were also associated with post-performance pain complaints (p=0.04).

Table 4 presents the variables of health and musical performance and their association with the dimensions of the C Scale. In the association with the performance of body practices and ergonomic posture, the knowledge of the meaning of CTD (p=0.04) and the performance of stretching during the instrumental practice (p=0.04) stood out at statistically significant levels.

Table 1: Association between sociodemographic and instrumental practice variables and pain complaints reported by music students.

Variable	Total		Pain complaints in the last 7 days				
			Yes		No		p*
	n	%	N	%	n	%	
Sex							
Female	10	29.4	06	60.0	04	40.0	0.69
Male	24	70.6	17	70.8	07	29.2	
Age Group							
18 – 19 years old	11	32.4	07	63.6	04	36.4	0.50
20 – 29 years old	19	55.9	12	63.2	07	36.8	
30 years and older	04	11.7	04	100.0	00	0.0	
Paid activity							
Yes, musician	04	11.8	03	75.0	01	25.0	0.87
Yes, other (teaching, trade)	12	35.3	09	75.0	03	25.0	
No	18	52.9	11	61.1	07	38.9	
Musical instrument used							
Rope	23	67.6	17	73.9	06	26.1	0.18
Blow	06	17.6	02	33.3	04	66.7	
Percussion	05	14.8	04	80.0	01	20.0	
Weekly music practice time							
04 to 08 hours	16	47.1	11	47.8	05	45.5	0.42
12 to 16 hours	07	20.6	06	26.1	01	9.1	
12 to 16 hours[a]	04	11.8	03	13.0	01	9.1	
20 hours or more	07	20.6	03	13.0	04	36.4	
Pauses during music practice							
Less than 10 minutes	11	32.4	08	34.8	03	27.3	0.62
10 minutes or longer	17	50.0	10	43.5	07	63.6	
Does not take breaks	06	17.6	05	21.7	01	9.1	
Total	34	100.0	23	67.6	11	32.4	

[a]Time of use of the musical instrument in training and professional activities as a musician.
*Fisher's exact test.

Knowledge about preventive methods for musicians' occupational health was associated with the importance of being monitored by a health professional (p=0.01), while the ergometric adequacy of the environment for study and instrumental practice was associated with knowledge about CTD (p=0.01), pain complaints in the last seven days (p=0.0006), and stretching during the instrumental performance (p=0.02). There was also an association between knowing the meaning of CTD and the students' sleep and eating patterns (p=0.03).

DISCUSSION

Global body self-awareness was more expressive in half of the sample studied, presenting variations more when related to the emotional and cognitive aspects of postural self-awareness (Scale A - 55.9%) and perception of pain in performance (Scale B - 52.9%). Students who were only engaged in higher

Table 2: The expressiveness of body self-awareness among college students.

Scales	High expressivity			Low expressivity			p*
	Full-time student	Studentwith profession as musician	Student with other profession	Full-time student	Studentwith profession as musician	Student with other profession	
	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	
Scale A general	11 (57.9)	01 (5.3)	07 (36.8)	07 (46.7)	03 (20.0)	05 (33.3)	0.40
Dimension 1	11 (57.9)	01 (5.3)	07 (36.8)	07 (46.7)	03 (20.0)	05 (33.3)	0.40
Dimension 2	10 (52.6)	01 (5.3)	08 (42.1)	08 (53.3)	03 (20.0)	04 (26.7)	0.34
		Total: 19 (55.9%)			Total: 15 (44.1%)		
Scale B	10 (55.6)	02 (11.1)	06 (33.3)	08 (50.0)	02 (12.5)	06 (37.5)	0.94
		Total: 18 (52.9%)			Total: 16 (47.1%)		
Scale C general	08 (47.1)	02 (11.8)	07 (41.2)	10 (58.8)	02 (11.8)	05 (29.4)	0.75
Dimension 1	09 (50.0)	03 (16.7)	06 (33.3)	09 (56.3)	01 (6.3)	06 (37.5)	0.62
Dimension 2	18 (52.9)	04 (11.8)	12 (35.3)	0 (0.0)	0 (0.0)	0 (0.0)	-
Dimension 3	08 (44.4)	03 (16.7)	07 (38.9)	10 (62.5)	01 (6.3)	05 (31.3)	0.47
Dimension 4	09 (47.4)	03 (15.8)	07 (36.8)	09 (60.0)	01 (6.7)	05 (33.3)	0.63
Dimension 5	12 (57.1)	02 (9.5)	07 (33.3)	06 (46.2)	02 (15.4)	05 (38.5)	0.78
		Total: 17 (50.0%)			Total: 17 (50.0%)		
Overall result	06 (35.3)	01 (5.9)	10 (58.8)	12 (70.6)	03 (17.6)	02 (11.8)	**0.01**
		Total: 17 (50.0%)			Total: 17 (50.0%)		

*Fisher's exact test.

Table 3: Distribution of variables according to Scales A and B.

Variables	N	%	Scale A				Scale B	
			Dimension 1		Dimension 2			
			Average	p*	Average	p*	Average	p*
Do you know about CTD?								
Yes	09	26.5	16.00	0.59	20.17	0.34	13.22	0.13
No	25	73.5	18.04		16.54		19.04	
Do you know about ergonomics?								
Yes	12	35.3	19.96	0.81	18.96	0.52	15.13	0.30
No	22	64.7	17.80		16.70		18.80	
Do you know about preventive methods against occupational diseases?								
Yes	13	38.2	15.73	0.41	17.31	0.92	16.88	0.77
No	21	61.8	18.60		17.62		17.88	
Do you have any paid activity?								
Yes, musician	04	11.8	11.75	0.46	9.38	0.07	19.63	0.90
Yes, another	12	35.3	18.54		21.79		17.33	
No	18	52.9	18.08		16.44		17.14	
Do you use any musical instruments beyond the context of curricular practice?								
Yes	04	11.8	11.75	0.23	9.38	0.08	19.63	0.66
No	30	88.2	18.27		18.58		17.22	
Do you have any musculoskeletal problems?								
Yes	08	23.5	20.75	0.29	25.56	**0.009**	20.88	0.27
No	26	76.5	16.50		15.02		16.46	
Have you felt any pain in the last 7 days?								
Yes	23	67.6	18.65	0.32	18.09	0.61	20.85	**0.004**
No	11	32.4	15.09		16.27		10.50	
What instrument do you use for performance in the course?								
Rope	23	67.6	16.63	0.11	18.02	0.44	18.74	0.10
Blow	06	17.6	14.00		13.17		09.92	
Percussion	05	14.8	25.70		20.30		20.90	
Do you take breaks while playing the musical instrument?								
Yes	28	82.4	18.30	0.30	17.34	0.83	18.63	0.15
No	06	17.6	13.75		18.25		12.25	
Do you routinely perform stretches during music practice?								
Yes	23	67.6	16.72	0.50	19.39	0.10	16.11	0.23
No	11	32.4	19.14		13.55		20.41	
Have you ever felt pain after a musical performance?								
Yes	19	55.9	20.47	**0.04**	18.26	0.61	20.79	**0.03**
No	15	44.1	13.73		16.53		13.33	

*Mann-Whitney U-test or Krusk al-Wallis U-test.

Table 4: Relationship between the variables and the dimensions of Scale C.

Variables	N	Scale C									
		Dimension 1		Dimension 2		Dimension 3		Dimension 4		Dimension 5	
		Average	p*	Average	p*	Average	p*	Average	p*	Average	p*
Do you know about CTD?											
Yes	09	23.33	**0.04**	19.17	0.52	24.50	**0.01**	20.89	0.23	23.28	**0.03**
No	25	15.40		16.90		14.98		16.28		15.42	
Do you know about ergonomics?											
Yes	12	20.88	0.14	16.46	0.62	19.50	0.38	18.08	0.79	19.50	0.37
No	22	15.66		18.07		16.41		17.18		16.41	
Do you know about preventive methods against occupational diseases?											
Yes	13	21.35	0.07	22.23	**0.01**	19.54	0.34	18.69	0.57	17.81	0.88
No	21	15.12		14.57		16.24		16.76		17.31	
Do you have any paid activity?											
Yes, musician	04	18.75	0.85	17.63	0.59	17.25	0.99	22.13	0.60	16.75	0.92
Yes, another	12	18.42		19.58		17.67		16.88		18.38	
No	18	16.61		16.08		17.44		16.89		17.08	
Do you use any musical instruments beyond the context of curricular practice?											
Yes	04	18.75	0.81	17.63	0.97	17.25	0.97	22.13	0.33	16.75	0.89
No	30	17.33		17.48		17.53		16.88		17.60	
Do you have any musculoskeletal problems?											
Yes	08	20.25	0.37	19.31	0.52	17.75	0.93	16.00	0.62	24.38	**0.02**
No	26	16.65		16.94		17.42		17.96		15.38	
Have you felt any pain in the last 7 days?											
Yes	23	15.83	0.15	16.00	0.16	14.26	**0.00**	16.04	0.21	16.48	0.37
No	11	21.00		20.64		24.27		20.55		19.64	
What instrument do you use for performance in the course?											
Rope	23	18.67	0.26	16.04	0.17	17.83	0.95	18.59	0.64	18.72	0.56
Blow	06	18.58		17.25		17.17		15.67		15.00	
Percussion	05	10.80		24.50		16.40		14.70		14.90	
Do you take breaks while playing the musical instrument?											
Yes	28	17.80	0.70	17.38	0.86	17.68	0.82	16.95	0.48	17.84	0.65
No	06	16.08		18.08		16.67		20.08		15.92	
Do you routinely perform stretches during music practice?											
Yes	23	19.74	**0.04**	18.57	0.32	20.09	**0.02**	17.52	0.98	18.93	0.20
No	11	12.82		15.27		12.09		17.45		14.50	
Have you ever felt pain after a musical performance?											
Yes	19	15.29	0.14	16.87	0.65	15.11	0.11	16.21	0.39	17.58	0.95
No	15	20.30		18.30		20.53		19.13		17.40	
Has the pain ever prevented you from continuing your musical performance?											
Yes	09	19.11	0.57	23.67	**0.01**	21.72	0.13	20.06	0.36	20.89	0.21
No	25	16.92		15.28		15.98		16.58		16.28	

*Mann-Whitney U-test or Kruskal-Wallis U-test.

education contributed to these variations, as they formed the most representative group.

On the other hand, when the preventive aspects of the musician's health were analyzed (Scale C), there was an association between being exclusively dedicated to the course and presenting low expressiveness (p=0.01). Factors such as pain complaints, musculoskeletal problems, and lack of knowledge about occupational health promotion practices were also negatively associated, figuring among the aspects that may favor the development of musculoskeletal disorders related to the musician's activity.

Studies in this labor population try to estimate the rate of musculoskeletal disorders, bringing varied definitions and numbers[15], and some show that there are no differences between the group of professionals and the group of students[4]. In general, these rates range from 10 to 79%, sometimes diverging when specific areas of the body are analyzed and may reach up to 94.8% when considering the symptoms reported in a period of up to one year[4,16-18]. Although the types of disorders are numerous, performance-related pain is frequently addressed, being present in 18.3 to 79.7% of the musicians in the samples studied[5,19,20].

Given the heterogeneity of studies in this area, among the factors that favor the establishment of diseases in musicians are pointed out the socio-demographic, health, physical, psychosocial, and work-related[21], such as inadequate environment[22]; instrument design and layout - generally the use of violin and piano

is associated with higher rates of disorders, although there are conflicting studies in this regard[5,23]; inadequate posture and long duration activities[24], age - there are disagreements whether young or older age; female gender; nutritional status - higher BMI[16,23]; physical fitness[25], among others.

Although in the present study there were no significant differences regarding pain complaints when comparing the groups by gender, age group or some of these specific factors, such as type of instrument used, frequency of use, and taking breaks, the overall rates did not differ from the literature. Although less than a third of the students reported some musculoskeletal problem (23.5%), most of them (55.9%) said they had already had pain after performing music, and a large portion of them (67.6%) reported this type of complaint in the seven days before the study.

Considering that the making and playing of music are processes in which the physical movements performed and the capacity to refine them directly affect the sonority and the communication with the audience and, therefore, avoid obstacles to expressiveness, technical problems, and even muscle tension, it is necessary to adopt an adequate posture, which includes the absence of effort, resistance, and the presence of reversibility of the movement[26].

Ideally, the ergonomic posture at the moment of using the instrument would have to involve the maintenance of all the parts of the body in the longitudinal direction, assuming a neutral position, which frequently does not occur, since the very principles of use contemplate repetitive movement, time-consuming and often asymmetric attitudes[27,28]. In addition, small alterations in the making of music may affect the final performance, becoming costly or even unfeasible in this aspect[2]. This indicates how complex the context involving musculoskeletal problems and their manifestations in the musical universe can be, triggering the need for a broad approach, especially in the university segment.

In addition to the postural issue, the literature reviewed[29] highlights that musicians, since the beginning of their training, are inserted in a context of demanding perfectionism in performance, with the ultimate goal of adapting the style to the standards of elite artists, which can also trigger musculoskeletal problems, pain, and anxiety in musical performance. In this sense, some authors[30] indicate that anxiety, added to lifestyle, is a predictor of other problems such as gastralgia, headache, irregular resting times, sleep disorders, and high levels of exhaustion.

In a study carried out with musicians from a symphonic orchestra[31], we found an association between musculoskeletal complaints and somatization, performance anxiety, and depressive disorder. Therefore, the results verified about post-performance pain complaints, emotional aspects, and perception of pain in the audience studied are a matter of concern.

Considering the possibility of worsening pain symptoms and the appearance of other problems after or during the music course, it is important to understand the importance of minimizing and preventing possible occupational damage, such as musculoskeletal and other types of damage to which musicians may be subjected, such as noise-induced hearing loss[32].

Therefore, it is worth pointing out the scarcity, but growing need, of health education courses in music courses to provide adequate guidance and referrals[33], as well as the role of the teaching staff given its importance in the adequate training for posture during the use of the instrument, especially to avoid permanent damage to health[34].

As much as the technical study, understanding the physical dynamics of making music is essential and demands equal knowledge and commitment. Developing the capacity for body self-awareness through anatomical self-perception allows for greater mastery of the body's functioning and, thus, a greater ability to discern the signs that indicate overload[35], which facilitates the approach for preventive measures.

A cohort study, with first-year classical music students aiming to investigate whether the way of defining injury in musicians is a factor impacting the prevalence of injury and disability, revealed that the percentages of injury varied according to the definition considered, demonstrating that the way students understand the musculoskeletal disorder and assign meanings to musculoskeletal issues can impact on the detection of potential injury and therefore the ability for timely intervention[36].

In this study, most students did not know the meaning of CTD (73.53%), ergonomics (64.70%), and preventive methods against occupational diseases in musicians (61.76%). However, even though a small part of the students knew the meaning of CTD, this knowledge was associated with the practice of stretching, warming up and muscle relaxation ($p=0.04$), and ergonomic adequation in the environment of study and instrumental practice ($p=0.01$).

From a biomechanical point of view, in the present study, 67.6% of the students stated that they stretch during the instrumental practice, which was associated with body understanding ($p=0.04$) and ergonomic organization of the environment ($p=0.02$). This understanding is essential for the musician's health since repetitive movements require a higher metabolic demand corresponding to an increase in oxygen consumption and this associated with the lack of rest promotes the production of lactic acid and consequently tissue damage, causing loss of elasticity and muscle fiber shortening[37].

In this research, most students stated that they took breaks while playing musical instruments (82.5%). Despite the pathophysiological understanding of pain after the performance and the importance of breaks, it is also relevant to understand that the need and guidelines for breaks in musical practice can have

repercussions that can be as significant for the musician as the complaint of pain itself[38], revealing the importance of preventive and health-promoting guidelines for this public continuously, to stimulate the adherence of these practices in their daily training.

The totality of the students surveyed also considered the follow-up with a health professional an important preventive attitude for health, however, this was significantly associated only with those who said they knew about preventive methods for occupational diseases, highlighting the importance of inserting themes about ergonomic health in the formative process of future musicians, aiming to provide physical and mental well-being, prevent posture-related injuries and reduce overall impacts on the future work routine[30].

Diet and sleep are also aspects investigated in research with music students. In this research, high expressiveness regarding healthy sleep and eating was verified and was associated with knowledge about CTD and the absence of musculoskeletal problems. Some studies[29,39] which showed that college students tend to practice healthy eating with a certain regularity, corroborate the findings of this research; however, regarding sleep, although it has been verified that they present a better quality when compared to other populations, some level of alteration is also described, estimating that, with time, more than 10% of students can present disorders, which vary from insomnia to excessive sleepiness[40].

This study aimed to analyze a complex and little explored outcome. Body self-awareness involves aspects that go from the physical, cognitive, emotional, and sensorial aspects, and its verification, from the perspective of physical, cognitive, and organizational ergonomics, can contribute to the promotion of occupational health and the prevention of musculoskeletal problems related to the musician's activity.

Conclusion

The analysis of music students' body self-awareness involving variables on musical practice, pain complaints, and occupational health knowledge, such as the one outlined in this study, enabled an initial understanding of how these students understand and experience the physical, cognitive, and emotional phenomena that involve the body in musical activity, and is presented as an advisory document for the planning and implementation of recommendations aimed at the global promotion of students' health, resulting in improved quality of life in the university environment.

On the other hand, the results found about the appearance of pain complaints and the low expressiveness of body self-awareness brought important reflections, since they present elements for the understanding of the factors that may favor the illness of future instrumentalists and highlighted aspects of the instrumental practice that may help in the elaboration of educational and preventive strategies directed to this public, especially those related to pain perception, to continuous preventive aspects, and self-awareness of the body in performance.

The study presented some limitations that should be considered. It was used a local sample, from a public educational institution in southern Ceará. Moreover, the small sample size should be considered as another limitation, since the results can only be generalized to the institution where the study was conducted. Therefore, it is suggested that studies of this scope be continued in other scenarios to compare the results and investigate other variables that may be associated with body self-awareness and musculoskeletal problems in college music students.

The study contributed to important reflections on the existence of musculoskeletal pain complaints among students and highlighted aspects of instrumental practice that may help in the development of preventive strategies and the promotion of healthy habits in the university context, with emphasis on body self-awareness.

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