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Is there an association between the subjective perception of pain and the performance of child athletes?

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ABSTRACT

Pain is described by the IASP as an unpleasant sensory and emotional experience linked to tissue damage. It serves as a warning against harmful stimuli and is vital for protecting the body. In the context of sport, athletes often have a higher tolerance to pain due to their physical and psychological endurance. However, in child athletes, microtraumas such as overuse injuries can go unnoticed due to the initial absence of symptoms such as pain and swelling. This study aims to associate pain perception, measured by the Visual Analog Scale, with physical performance in child athletes.

Keywords: Physical assessment, Child athletes, Pain.

INTRODUCTION

Pain, explained by the International Association for the Study of Pain (IASP) in 1986, as an "unpleasant sensory and emotional experience associated with current or potential tissue damage", (CIENA, et al., 2008), reflects in the interpretation of a harmful stimulus, protecting the organism, representing an alarm signal, being a vital element (OLIVEIRA, et al., 2014).

Thus, in an attempt to objectively demonstrate the pain reported by the patients, unidirectional and multidirectional instruments were developed. Unidirectional instruments are the most used, quantifying the intensity or severity of pain, such as the Visual Analogue Pain Scale (VAS) (CIENA, et al., 2008), which consists of a horizontal line scale, numbered from 0 to 10, with the extremes reflected for "No Pain" and "Maximum Pain" and the volunteer performs the marking according to the representativeness of his pain.

In the sports context, athletes have a higher pain tolerance compared to non-athletes, which is a consequence of the physical and psychological resistance acquired by exposure to exertion and painful

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experiences (TESARZ, et al., 2012). However, considering the sports child population, musculoskeletal microtraumas are dangerous, since they do not present pain or swelling, such asoveruse injuries (ROSE JUNIOR. D, et al., 2009). And in this way, the monitoring of this symptom and its consequences on performance is important.

Therefore, this study aims to verify the association between the subjective perception of pain by means of the VAS scale and a battery of strength tests in child athletes.

MATERIALS AND METHODS

This is a cross-sectional observational study, carried out from the Permanent Program: Physical Activity and Health in Physical Therapy (Secapee 5766), of the Study and Research Group on Physical Activity and Health (GEPAFS) of the State University of Northern Paraná (UENP). In total, 37 healthy and active children between four and fourteen years of age were evaluated. The study took place on two different days in the athletes' training schedules, with the participants performing the tests on the same day. The place used for the collection was the athletes' training center: Athletica Futsal, located in Jacarezinho - PR.

Through the application of a form made in Google Forms, a complete anamnesis was performed for possible diagnoses and then the VAS scale and the map of body regions were applied to observe the site of pain.

After this stage, the application of physical tests began according to the 2021 update of a test battery of the Projeto Esporte Brasil (PROESP-br), a project of the School of Physical Education, Physiotherapy and Dance of the Federal University of Rio Grande do Sul (UFRGS), with the first tests applied being those of jumps: 1-) Vertical jump, the athlete positions himself close to the wall and performs three vertical jumps, the jump with the greatest range being noted; 2-) Horizontal jump, where the athlete positioned himself at the beginning of a tape measure and jumped forward, also performed in three attempts and the longest distance was noted.

After the jumps, the athletes went on to the speed tests, starting with the agility T-test, where the athlete performed a 10m frontal run, moved laterally to the left for 5m, returned to the right for 10m, returned to the left again for 5m and ended by moving the 10m back. Next, the 20-meter displacement speed test was performed, with the athlete performing a frontal run from one cone to the other at a distance of 20m. The third test performed was the square test, where a square with 4 cones was formed, spaced by 4m each, thus, the athlete performs a frontal run crossing the square, it moves laterally to the right, crosses the square running backwards and ends up moving laterally to the left, totaling 16m, 4m for each displacement. Finally, a strength test was performed for the abdominal muscles. In this session, the

athlete remained in the supine position and performed the maximum repetition of trunk flexion in 60 timed seconds.

Statistical analyses were performed using the Statistical Package for the Social Sciences (SPSS) (version 23; SPSS Inc, Chicago, IL). The categorical variables (presence or absence of pain and performance) were expressed as absolute and relative frequency, so a dichotomization was performed for the use of the chi-square test in the observation of possible relationships between them. For all analyses, the statistical significance was established at 0.05. The dichotomization occurred as follows: the tests were classified as 1 positive (good *performance*) and 0 as negative (poor *performance*). For this classification, the mean values of the population were used, with values equal to or above the mean considered 1 and below the mean considered 0 for the vertical jump, long jump and abdominal tests, and values equal to or below the mean considered 1 and above 0 considered for the speed tests: Agility T-test, displacement test and the square test.

RESULTS

Table 1 shows the anthropometric characteristics of the sample and control values performed prior to the tests.

Table 1. Sample characterization

	Mean (SD)	Med (min; máx)
Age (years)	8,28 (2,83)	8 (4; 14)
Weight (Kg)	37,94 (16,49)	35,6 (13,7; 90,5)
Height (cm)	136 (19,53)	138 (99; 173)
Wingspan (cm)	131,85 (21,47)	132,5 (91; 184)
Systolic blood pressure (mmHg)	102,6 (13,52)	100 (80; 120)
Diastolic blood pressure (mmHg)	65,2 (12,16)	70 (40; 80)
SpO2 (%)	97,9 (2,11)	98 (85; 100)
Heart rate (bpm)	94,96 (15,15)	95 (65; 133)
Temperature (°C)	35,6 (0,77)	36 (34; 36,6)
Training time (months)	18,3 (15,23)	12 (1; 60)

Legend: DP: standard deviation; Mean: median; Min: minimum; Max: maximum; Kg: chylograms; Cm: centimeters; mmHg: millimeters of mercurium; %: percentage of oxygen; bpm: beats per minute; °C: degrees Celsius. n = 56.

Figure 1 shows the site of pain reported by the athletes, with the lower limb having the highest prevalence found in this population (63.6%) (Figure 1.a) characterized by the highest percentage in the thigh region (27.3%)

Figure 1. (A) General location of pain, according to a map of body regions; (B) Specific location of pain.

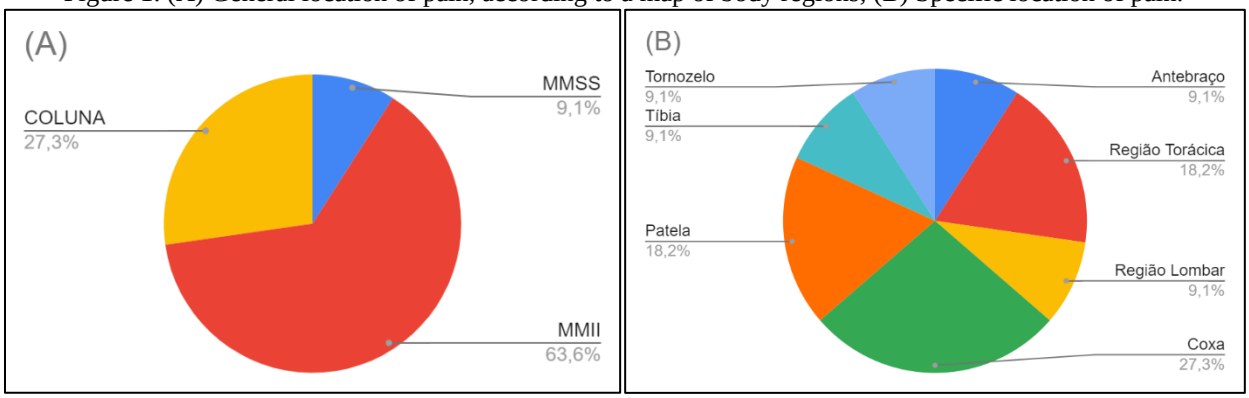

Table 2 shows the relationship between the categorized variables of the study: pain *versus* performance. It was not possible to observe significant correlations (p-value > 0.005) for any of the tests of the battery used with the presence or absence of pain.

Table 2. Chi-square correlations for categorical variables (pain *versus* performance)

		IN PAIN	NO PAIN	P-VALUE
Vertical Jump	Positive Performance	8(66,60%)	10(40%)	0,129
	Negative Performance	4(33,30%)	15(60%)	
Long Jump	Positive Performance	8(66,60%)	13(52%)	0,286
	Negative Performance	4(33,30%)	12(48%)	
Abdominal	Positive Performance	7(58,30%)	14(56%)	0,893
	Negative Performance	5(41,70%)	11(44%)	
T-Test	Positive Performance	8(66,60%)	12(48%)	0,286
	Negative Performance	4(33,30%)	13(52%)	
Square Test	Positive Performance	7(58,30%)	12(48%)	0,556
	Negative Performance	5(41,70%)	13(52%)	
Travel Speed	Positive Performance	7(58,30%)	13(52%)	0,717
	Negative Performance	5(41,70%)	12(48%)	
Legend: N-sample: 37 athletes				

Considering the sport investigated, a higher prevalence of pain in the lower limbs was expected, and as reported (LEHMAN and CARL), children usually reported pain in the legs, in the morning and evening, and it is also possible to establish a relationship between these reported pains and the natural process of child growth and not directed to any injury installation, which explains the lack of association with loss of performance.

In addition, it is possible that a relationship was not obtained due to the child population together with the evaluation method used, resulting in a lack of exact understanding of the question or even difficulty in the self-perception of this sample. Therefore, it suggests the use of other scales that are more detailed and visual aimed at children. Still, a factor that deserves to be noted is the difference in the age of the population.

FINAL CONSIDERATIONS

There was no association between pain and performance. Therefore, new studies need to pay attention to new scales/questionnaires to investigate pain in this population, since it is understood that it is necessary to monitor athletes from their initial phase to the sport, considering actions in the prevention and even treatment of possible injuries.

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