**Background:** Some studies suggest a high economic burden among children and adolescents with musculoskeletal pain. However, there is no summary in the literature to understand the scenario of the economic burden of musculoskeletal pain in this population.

**Objectives:** This study aimed to synthesize the economic burden of musculoskeletal pain in children and adolescents.

**Methods:** We conducted electronic searches on MEDLINE, EMBASE, CINAHL, EconLit, NHS-EED, and HTA databases from inception to July/2022. We included cost-of-illness studies that estimated healthcare, patient/family, lost productivity, and/or societal costs in children and adolescents (up to 24 years old) with musculoskeletal pain. The primary outcome was cost, and the results were grouped by the same cost categories (i.e., healthcare, patient/family, lost productivity, societal), conditions, time horizon, and cost range for musculoskeletal pain. All costs were inflated to the same reference year (2021) and converted to American Dollars ($). The risk of bias the included studies was assessed using a checklist based on the Consolidated Health Economic Evaluation Reporting Standards (CHEERS) statement.

**Results:** We included 45 cost-of-illness studies (n=665,623). Thirty-eight studies (84.4%) were conducted in high-income countries, six (13.3%) in upper-middle-income countries, and one (2.2%) in lower-middle-income countries. Regarding the risk of bias assessment, 75.5% (n=34 studies) clearly presented the unit costs, and 69% (n=31 studies) presented the expenditure data transparently. In contrast, more than half of the studies did not include productivity costs or sensitivity analysis. The annual healthcare costs ranged from $143 to $41,379 per child/adolescent (n=22 studies). The annual patient/family costs ranged from $287 to $27,972 per child/adolescent (n=9 studies). The annual lost productivity costs ranged from $1,095 to $69,351 per child/adolescent (n=9 studies). Children and adolescents with juvenile idiopathic arthritis and musculoskeletal pain had higher annual incremental healthcare costs than children and adolescents without those conditions (mean difference: $3,800, 95% confidence interval [CI]: 50 to 7,550; mean difference: $740, 95% CI: 470 to 1,010, respectively).

**Conclusion:** The annual economic burden of musculoskeletal pain per child and adolescent ranged from $124 to $69,351.

**Implications:** This systematic review summarizes the evidence of the economic burden of musculoskeletal pain in children and adolescents. The results of this study showed that the musculoskeletal pain in children and adolescents seems to represent an important part of the economic burden in children’s health. However, our estimates span a large range for all cost categories, making it difficult to interpret the economic burden in this population.

**Keywords:** Musculoskeletal pain, Systematic review, Economic burden

**Conflict of interest:** The authors declare no conflict of interest.

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**Ethics committee approval:** Not applicable.

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Implications: The next step will be to test the feasibility of the intervention, co-designed with the target audience, which can lead to better results as it considers the real needs of the studied population.

Keywords: Patient and Public Involvement, Cerebral Palsy, Leisure

Conflict of interest: The authors declare no conflict of interest.

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HEART RATE VARIABILITY AND FUNCTIONAL CAPACITY OF INDIVIDUALS WITH TYPE 2 DIABETES AFFECTED BY COVID-19 IN THE LONG TERM

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Background: COVID-19 can worsen the clinical and functional condition of individuals with chronic diseases such as type 2 diabetes (DM2). There is a lack of knowledge regarding the long-term autonomic and functional impairments of individuals with T2DM affected by COVID-19.

Objectives: To assess whether individuals with DM2 affected by COVID-19 for one year or more have reduced heart rate variability (HRV) and functional capacity compared to those without a history of this disease.

Methods: This cross-sectional case-control study. The sample consisted of individuals with DM2, with a history of COVID-19 (DMCoV Group), and without a history of COVID-19 (DM Group). All participants had their level of physical activity assessed using the International Physical Activity Questionnaire (short version). Heart rate (HR) and the following HRV measurements were evaluated at rest: standard deviation of normal R-R intervals (SDNN); root mean square differences between successive INN (RMSSD); percentage of successive INN with difference >50ms (pNN50); low (LF) and high frequency (HF) spectral components in absolute (ms²) and normalized (u.u) units. Functional capacity was evaluated based on the distance covered in the Incremental Shuttle Walking Test (ISWT) in meters. Data distribution was assessed using the Shapiro-Wilk test. Variables with normal distribution are expressed as mean ± standard deviation and the others as median [interquartile range]. Categorical variables were compared using the chi-square test, and numerical variables using the unpaired t-test or the Mann-Whitney test. For all tests, a significance level of 5% was adopted.

Results: Twenty-three individuals of both sexes participated in the study, nine from the DMCoV group and fourteen from the DM group (61.78±10.39 years vs. 55.29±9.69 years; P=0.142; 33.3% women vs. 50% women; P=0.669). There was no significant difference in the level of physical activity between the DMCoV and DM groups (P=0.235): very active (33.3% vs. 35.7%), active (22.2% vs. 50.0%), irregularly active (22.2% vs. 14.2%) and sedentary (22.2% vs. 0.0%). HR (71.9±10.5 bpm vs. 72.6±11.5 bpm; P=0.876), HRV measurements (SDNN(ms): 39.0±20.8 s vs. 25.7±13.5 s; P=0.076. RMSSD(ms): 20.7±3.5-7.8 s vs. 13.2±9.1-26.7 s; P=0.403. pNN50(%): 2.3±0.5-27.0 s vs. 0.4±0.2-7.7 s; P=0.159. LF(ms²): 346.0±65.0-614.0 ms² vs. 199.0±29.3-343.3 ms²; P=0.277. HF(ms²): 125.0±26.5-705.0 ms² vs. 82.0±26.8-253.8 ms²; P=0.439 LF(un): 64.2±16.8 ± vs. 59.4±17.4 ± P=0.518 HF(un): 35.6±16.8 ± vs. 40.2±16.7 ±; P=0.528) and functional capacity (272.5±112.7 meters vs. 373.9±105.6 meters; P=0.051) showed no significant difference when comparing the groups DMCoV and DM.

Conclusion: COVID-19 did not impair long-term cardiac autonomic modulation in individuals with T2DM. On the other hand, the fact that individuals with a history of COVID-19 walked an average of a hundred meters less on the ISWT compared to those without this history suggests impairment of functional capacity caused by COVID-19.

Implications: The findings of this study are preliminary and point to the need for future investigations involving a larger sample size and including other measures of modulation and cardiac autonomic function to confirm the results found.

Keywords: Diabetes Mellitus, COVID-19, Autonomic Nervous System

Conflict of interest: The authors declare no conflict of interest.

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UNPLANNED EXTUBATION: CHARACTERISTICS OF NEWBORN INFANTS HOSPITALIZED IN A NEONATAL INTENSIVE CARE UNIT

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Background: Unplanned extubation is an adverse event associated with endotracheal intubation and the use of invasive mechanical ventilation. Extubation failure and the need for reintubation are considered procedures that increase neonatal morbidity and mortality.

Objectives: To analyze the characteristics of newborns who had an unplanned extubation event during their stay in a neonatal intensive care unit (NICU).

Methods: The data from this study belong to a multicenter study called “Predictive factors for extubation failure in newborns admitted to a NICU: a multicenter study”. Data were collected from hospitalization records from July 2017 to 2019. Newborns who used invasive mechanical ventilation through an orotracheal tube for at least 24 hours were included. Data collection was carried out in six NICUs in five Brazilian cities: Manaus-AM (North), Natal-RN (North-east), Brasilia-DF (Central-West), Belo Horizonte-MG (Southeast) and Florianópolis and São José-SC (South). The information extracted from the medical records was transcribed into Microsoft