

The PED-SARC-F as a Screening Tool for Physical Fitness after Pediatric Hematopoietic Stem Cell Transplantation

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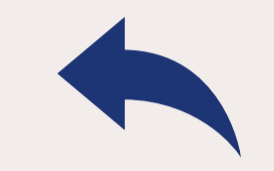

Background

- Allogeneic hematopoietic stem cell transplantation (HSCT) is an intensive treatment for children with hematological disorders.
- Reduced physical function prior to HSCT is associated with reduced physical function after HSCT.¹
- Early identification of children at risk for reduced physical fitness after HSCT is essential to optimize interventions.
- The Pediatric SARC-F (PED-SARC-F) is a 5-item questionnaire² (Table 1), which may provide a practical way to identify children at risk.

Aim

- To determine if there is an association between the pre-HSCT PED-SARC-F score and physical function, muscle strength and muscle mass in children 100 days post-HSCT.

Methods

-  Age 3-18 years
-  (Non-)Malignant hematological diseases
-  Allogeneic HSCT (2018 - 2023)
-  Retrospective cohort study
-  Multiple linear regression analyses
 - Independent: PED-SARC-F (Table 1), age, weight, sex
 - Dependent: Physical fitness tests (Table 2)

Timeline



Table 1: PED-SARC-F questionnaire

Strength	How much difficulty do you have in lifting something heavy?	0 / 1 / 2
Walking	How much difficulty do you have walking across a room?	0 / 1 / 2
Rising from floor	How much difficulty do you have rising from the floor?	0 / 1 / 2
Walking stairs	How much difficulty do you have climbing a flight of stairs?	0 / 1 / 2
Falls	How many times have you fallen in the last 2 weeks?	0 / 1 / 2
Total PED-SARC-F score		

None = 0 / Some difficulties = 1 / A lot or unable = 2
 Falls: never = 0 / 1-3 falls = 1 / ≥4 falls = 2


Table 2: Physical fitness tests


100 days post-HSCT

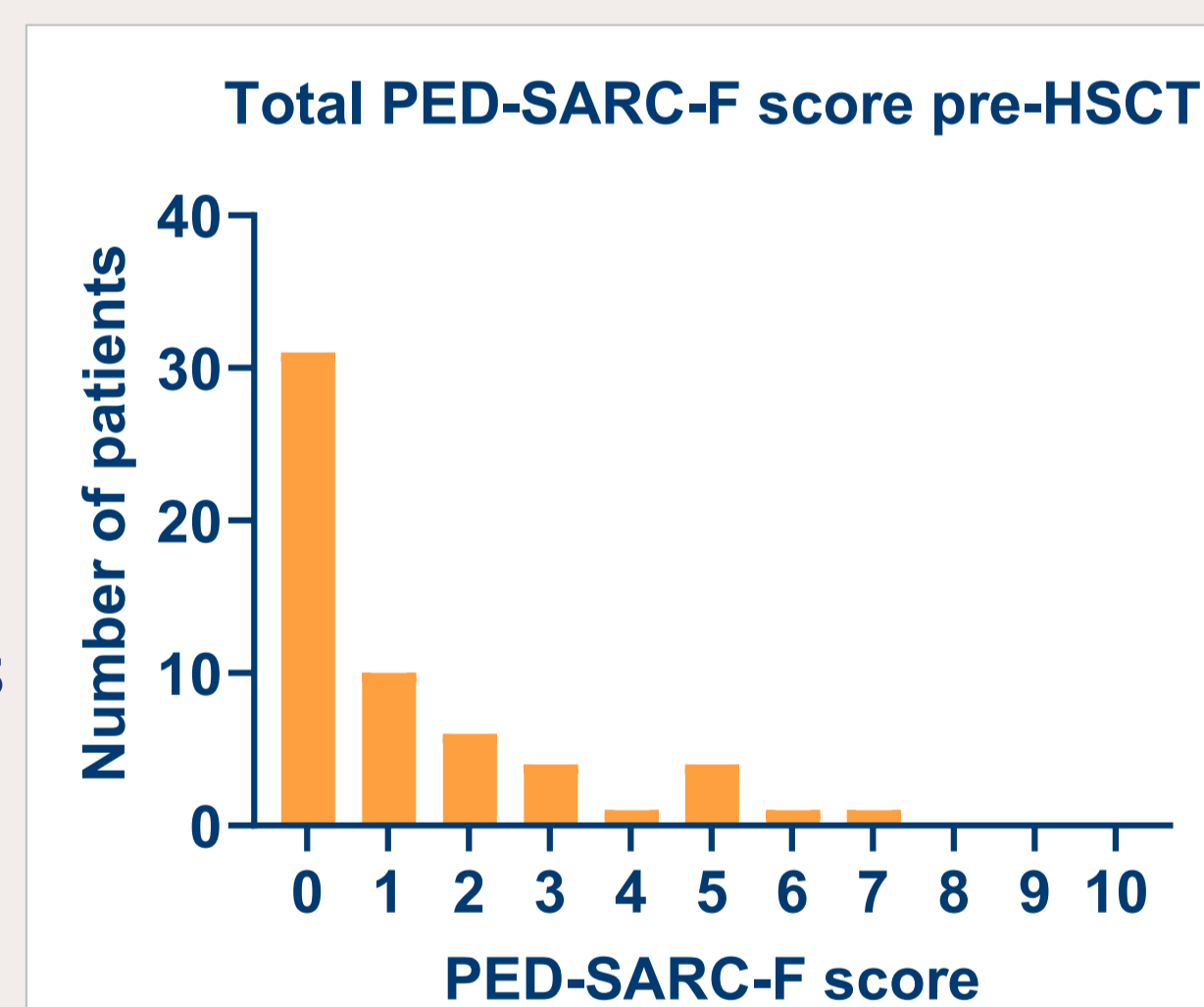
Physical function (s)
Time to Rise from the Floor (TRF)
Ten Meter Walk Test (10MWT)
Ten Meter Run Test (10MRT)
Timed Up and Down Stairs (TUDS)
Muscle strength (N) – Hand-held Dynamometry
Hip flexion
Knee extension
Ankle dorsiflexion
Muscle mass (kg) - Bioelectrical Impedance Analysis (Tanita)
Appendicular Skeletal Muscle Mass (ASMM)

Results

 58 children

 Mean(SD) age: 12.2 (3.9) years

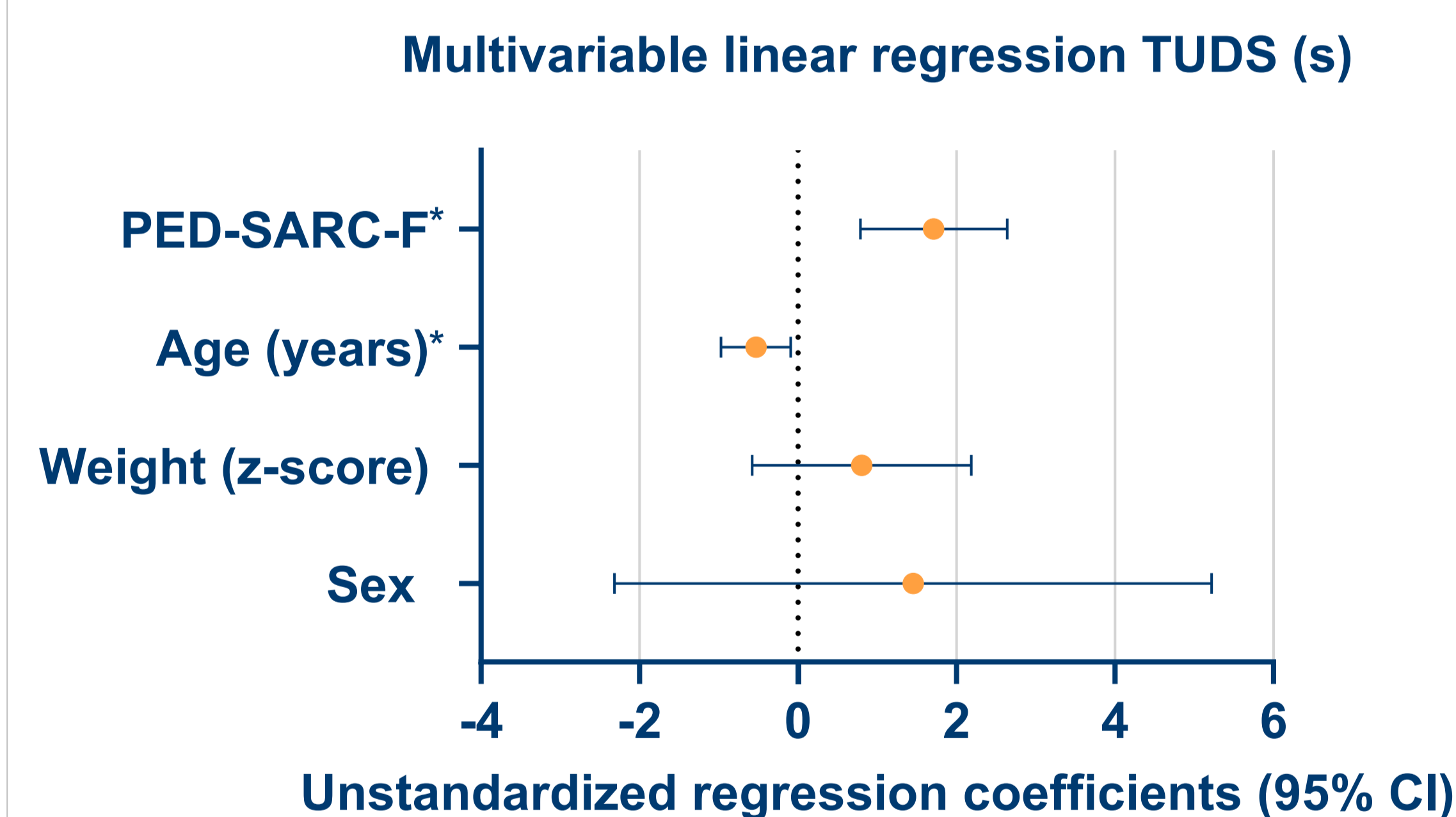
 72.4% boys



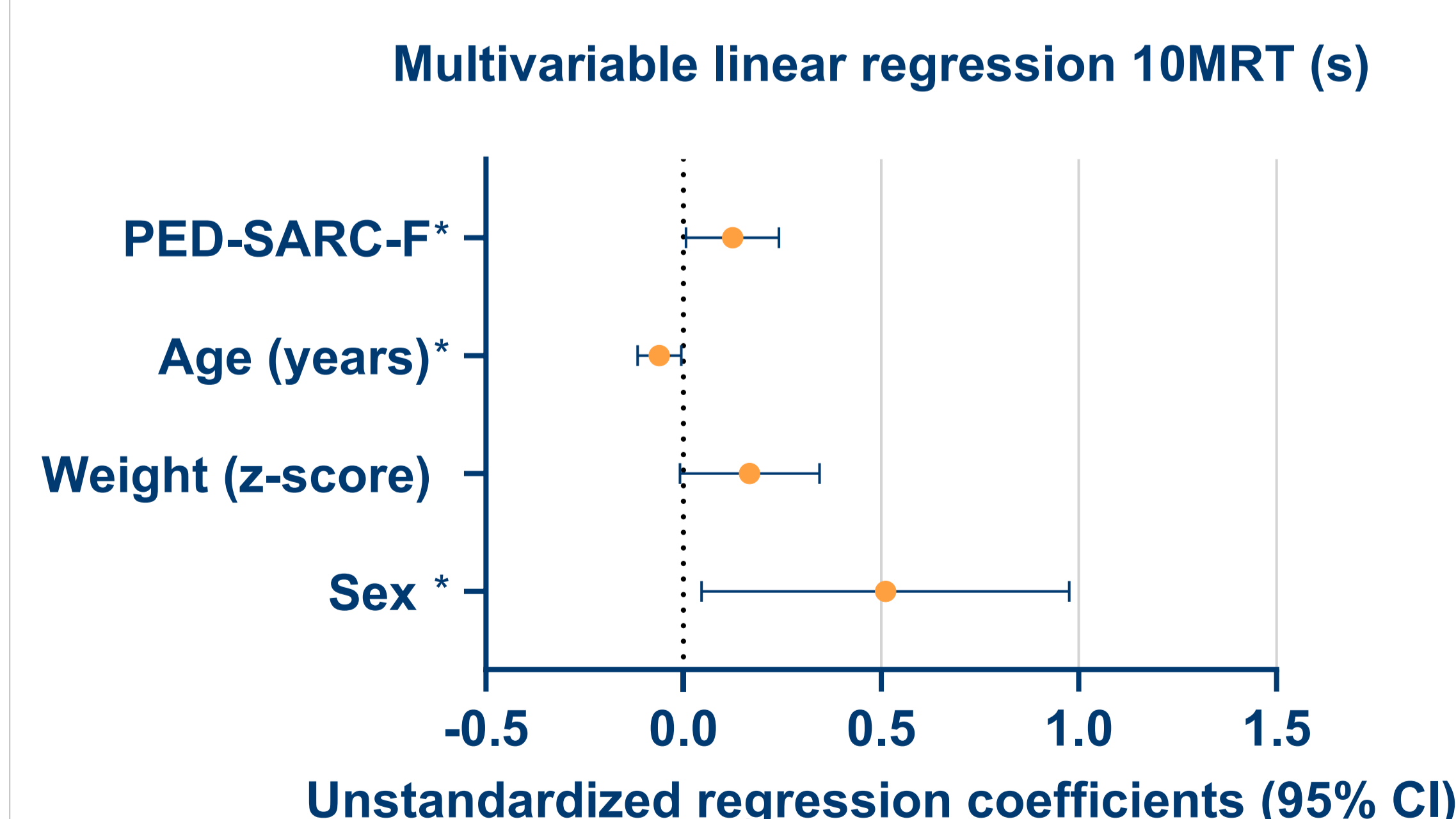
- Higher PED-SARC-F scores were associated with:
 - Poorer stair-climbing performance (TUDS) (B=1.715, 95%CI= 0.790 – 2.640)
 - Slower running performance (10MRT) (B=0.125, 95%CI= 0.007 – 0.242)
- There was a positive association between the PED-SARC-F score and ankle dorsiflexion (B=0.125, 95%CI= 0.059 – 0.606)
- No association was found between the PED-SARC-F score and 10MWT, TRF, hip flexion strength, knee extension strength and ASMM

Conclusions

- A higher PED-SARC-F score prior to HSCT is associated with lower function in stair-climbing and running speed 100 days post-HSCT.
- Pre-HSCT physiotherapy assessment using the PED-SARC-F can help to identify children at risk for poorer stair-climbing function or running speed 100 days post-HSCT.



*p<0.05



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References

1. den Hartog et al. (2024). Physical performance before and after hematopoietic stem cell transplantation in pediatric patients: a potential role for prehabilitation. Bone Marrow Transplantation.
2. Verwaaijen, E. J. et al. (2023). Novel Adaption of the SARC-F Score to Classify Pediatric Hemato-Oncology Patients with Functional Sarcopenia. Cancers, 15(1).