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Handgrip strength among children with CF: is there a correlation with lung function?

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Background

- Good nutritional status and growth positively affect pulmonary function among children with CF.
- Nutritional routine assessment of children with CF includes measurements of body weight, height, and BMI.
- HGS, an indicator of body composition in pwCF, is not routinely measured.
- A non-invasive, inexpensive, reliable and easy-to-measure method that reflects LBM changes is the measurement of handgrip strength (HGS).

Aim

1. To compare nutritional status (HGS) between children with CF and healthy children
2. To assess the possible relationship of nutritional (HGS) and pulmonary function parameters among children with CF

Methods

- 49 children with CF and 53 healthy children:
- Weight, height, BMI, and hand grip strength, HGS
- Children with CF performed spirometry
- Nutritional parameters were correlated with spirometry parameters among children with CF.

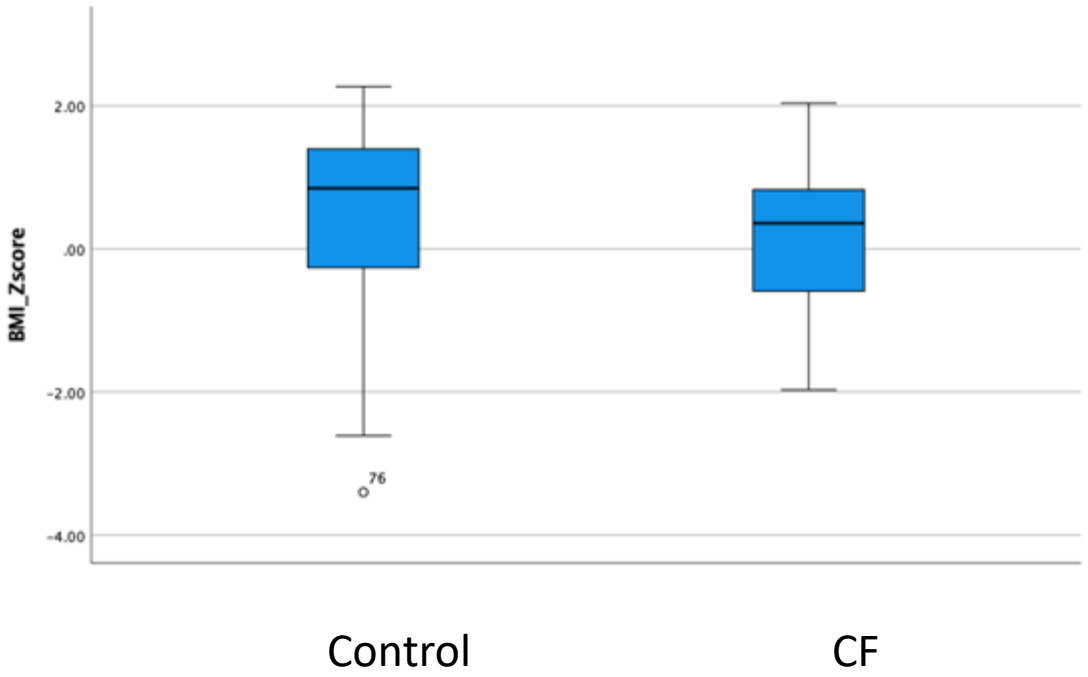
Descriptive statistics of the study population

		Mean	Std. Dev	P
Age, years	Control	11,39	4,61	0,062
	CF	12,18	4,15	
HGS, kg	Control	24,49	13,12	0,097
	CF	20,33	11,83	
BMI, kg/m2	Control	19,61	4,632	0,483
	CF	19,01	3,862	
BMI-z score	Control	0,440	1,321	0,153
	CF	0,098	1,051	

Descriptive statistics of the study population

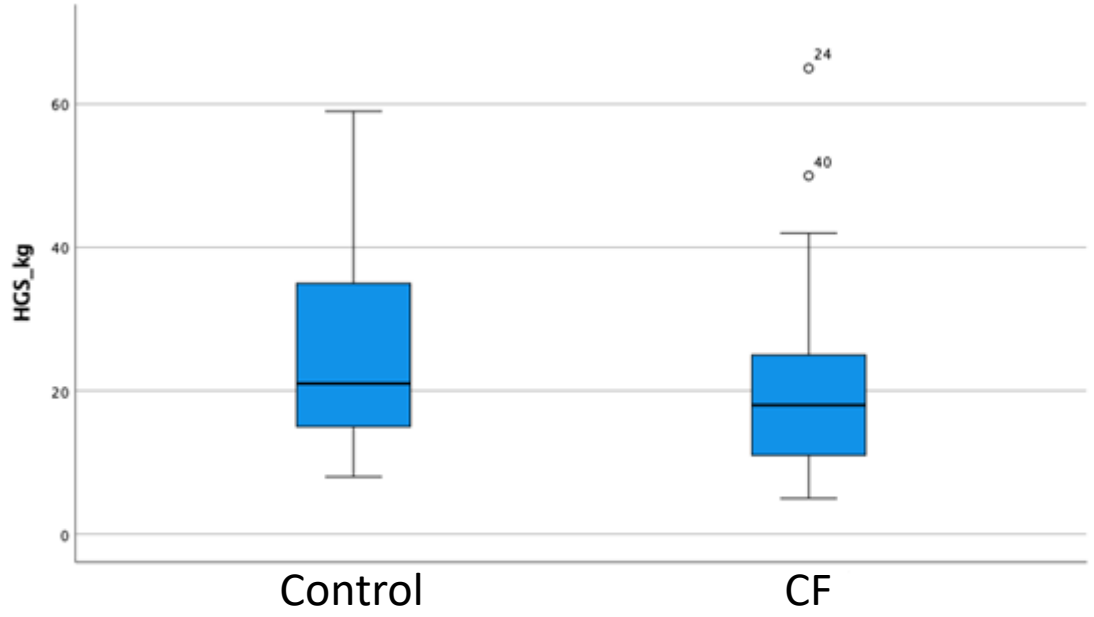
Spirometry parameters among children with CF (N=49)	Mean (SD)
FVC, lt	2.94 (2.04)
FVC %pp	110.3 (23.1)
FEV1, lt/sec	1.99 (1.74)
FEV1 %pp	105.6 (23.4)
FEF50, lt/sec	3 (1.44)
FEF50 %pp	91.5 (34.7)

Results



Median BMI z-score in the CF group was comparable to the healthy group (0.09 vs. 0.44, p=0.153).

Results

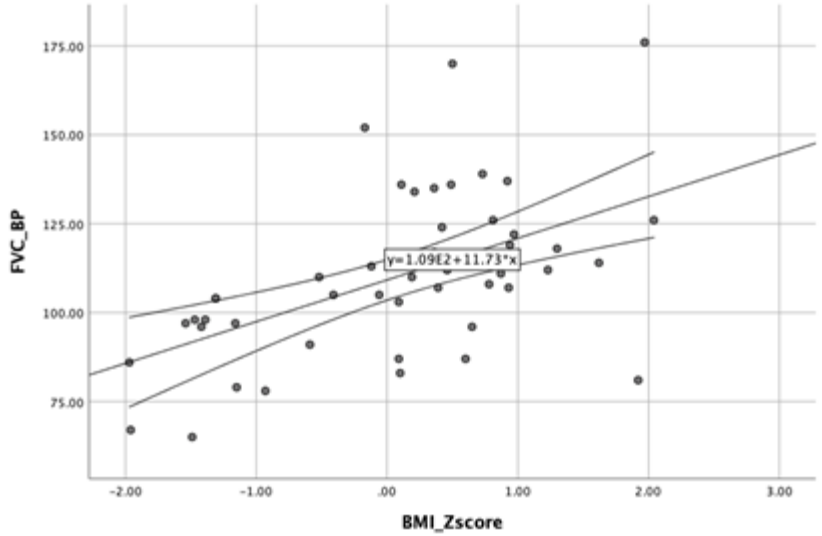


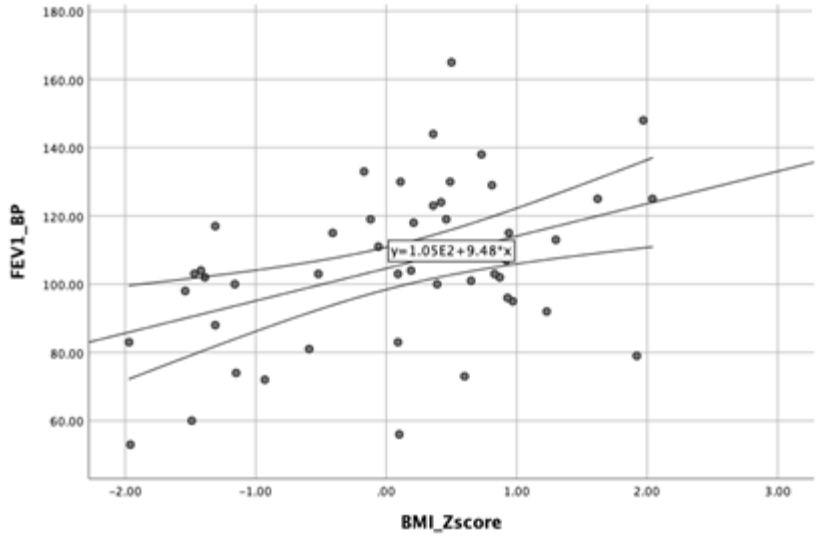
Median HGS in the CF group was comparable to the healthy group (20.3 vs. 24.5, p=0.097).

Results

Body measurements of children with CF		P value
Weight z-score	**FVC, lt**	**r=0.4, p=0.004***
	FVC %pp	**r=0.37, p=0.008***
	FEV1, lt/sec	**r=0.38, p=0.006***
	FEV1 %pp	**r=0.31, p=0.03***
	FEF50, lt/sec	**r=0.27, p=0.06***
	FEF50 %pp	r=0.13, p=0.34
Height z-score	FVC , lt	r=0.16, p=0.26
	FVC %pp	r=0.03, p=0.83
	FEV1 , lt/sec	r=0.19, p=0.17
	FEV1 %pp	r=0.03, p=0.81
	FEF50, lt/sec	r=0.2, p=0.16
	FEF50 %pp	r=0.09, p=0.53
BMI z-score	**FVC, lt**	**r=0.34, p=0.016***
	FVC %pp	**r=0.57, p=0.00***
	FEV1, lt/sec	**r=0.29, p=0.04***
	FEV1 %pp	**r=0.35, p=0.01***
	FEF50, lt/sec	r=0.06, p=0.69
	FEF50 %pp	r= -0.01, p=0.93
HGS	**FVC, lt**	**r=0.8, p=0.001***
	FVC %pp	r=0.07, p=0.65
	FEV1, lt/sec	**r=0.78, p=0.001***
	FEV1 %pp	r= -0.006, p=0.96
	FEF50, lt/sec	**r=0.62, p=0.001***
	FEF50 %pp	r=0.07, p=0.65

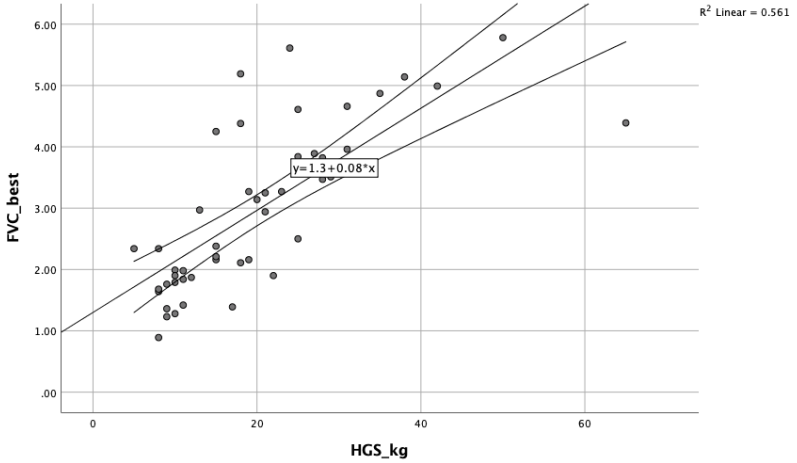
Results

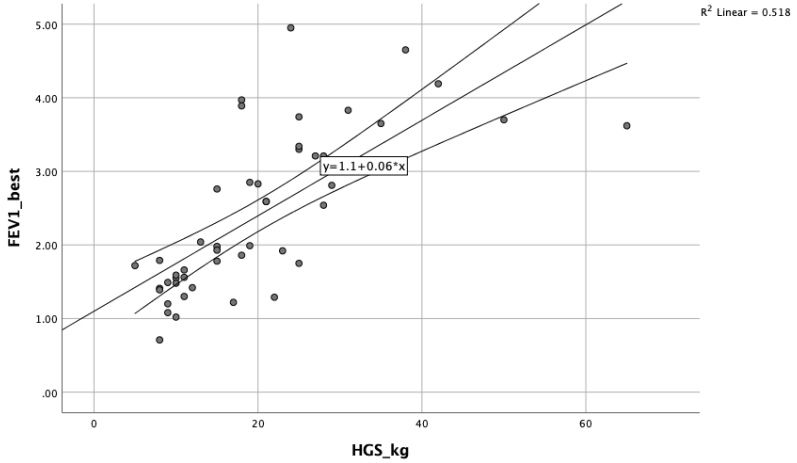




BMI z-score was significantly correlated with:

- FVC %pp (r=0.57, p=0.00)
- FEV1 %pp (r=0.35, p=0.01)





HGS was significantly correlated with :

- FVC (lt), (r=0.8, p=0.00)
- FEV1 (lt/sec), (r=0.78, p=0.00)

Conclusions

- A strong correlation between lung function measured with spirometry and nutritional body parameters including HGS among children with CF.
- HGS is a reliable and easy-to-measure indicator of muscle mass and reflects body composition changes.
- HGS, combined with weight, height, and BMI, can be used as an additional nutritional assessment tool among children with CF.

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References:

- Sahlberg M, Svantesson U, Magnusson Thomas E, Andersson BA, Saltin B, Strandvik B. Muscular strength after different types of training in physically active patients with cystic fibrosis. Scand J Med Sci Sports. 2008 Dec;18(6):756-64.
- Gibson HT, McDonald CM, Derrick JW, Eggett DL, Bellini SG. Evaluating Changes in Handgrip Strength in Children With Cystic Fibrosis: A Pilot Study. Nutr Clin Pract. 2018 Apr;33(2):261-267
- Bellini SG, Chapman P, Szendre K, McDonald C, Williams N, Hopkin L, Eggett D, Dean A. Changes in handgrip strength in children with cystic fibrosis compared to children without cystic fibrosis. Clin Nutr ESPEN. 2021 Apr;42:206-211.