

Impaired motor performance in Turner syndrome: what is its relation to psychological tests?

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Background

Motor performance is often impaired in patients with Turner syndrome. The exact prevalence of motor problems is unknown and the etiology is unclear.

Objectives

- To describe motor performance in our population of children and adolescents with Turner syndrome including the differentiation in specific motor skill domains.
- To identify the relationship between motor performance and intelligence scores, processing speed and visual-motor integration.

Turner population : n = 121

Excluded:

- No informed consent (n = 6)

Study population : n = 115
(age 11.9 ± 4.3 years; 35% 45,X)

- MABC-2 and VMI (n = 66)
- WPSSI-III and WISC-III (n = 53)
- No tests (n = 41)

Methods & Materials

Participants were enrolled at the Radboudumc Turner Centre of Expertise, Nijmegen, the Netherlands.⁶ We offer motor and psychological screening at the time of diagnosis and according to our Turner protocol at ages 3, 5, 11 and 16 years (at 3 years only motor tests).

Motor performance

The Movement Assessment Battery for Children-2 (MABC-2) was used. The MABC-2 includes a total score and 3 domain scores on 1) manual dexterity, 2) ball skills and 3) static and dynamic balance. The reference value is a standard score of 10 ± 3 SD.

Intelligence scores and Processing Speed (PS)

The WPSSI-III (for age 3-8 years) and the WISC-III (for age 6-17 years) was used to measure total IQ (TIQ), verbal IQ (VIQ) and performance IQ (PIQ), and the processing speed (PS). The reference value is 100 ± 15 SD.

Visual-Motor Integration (VMI)

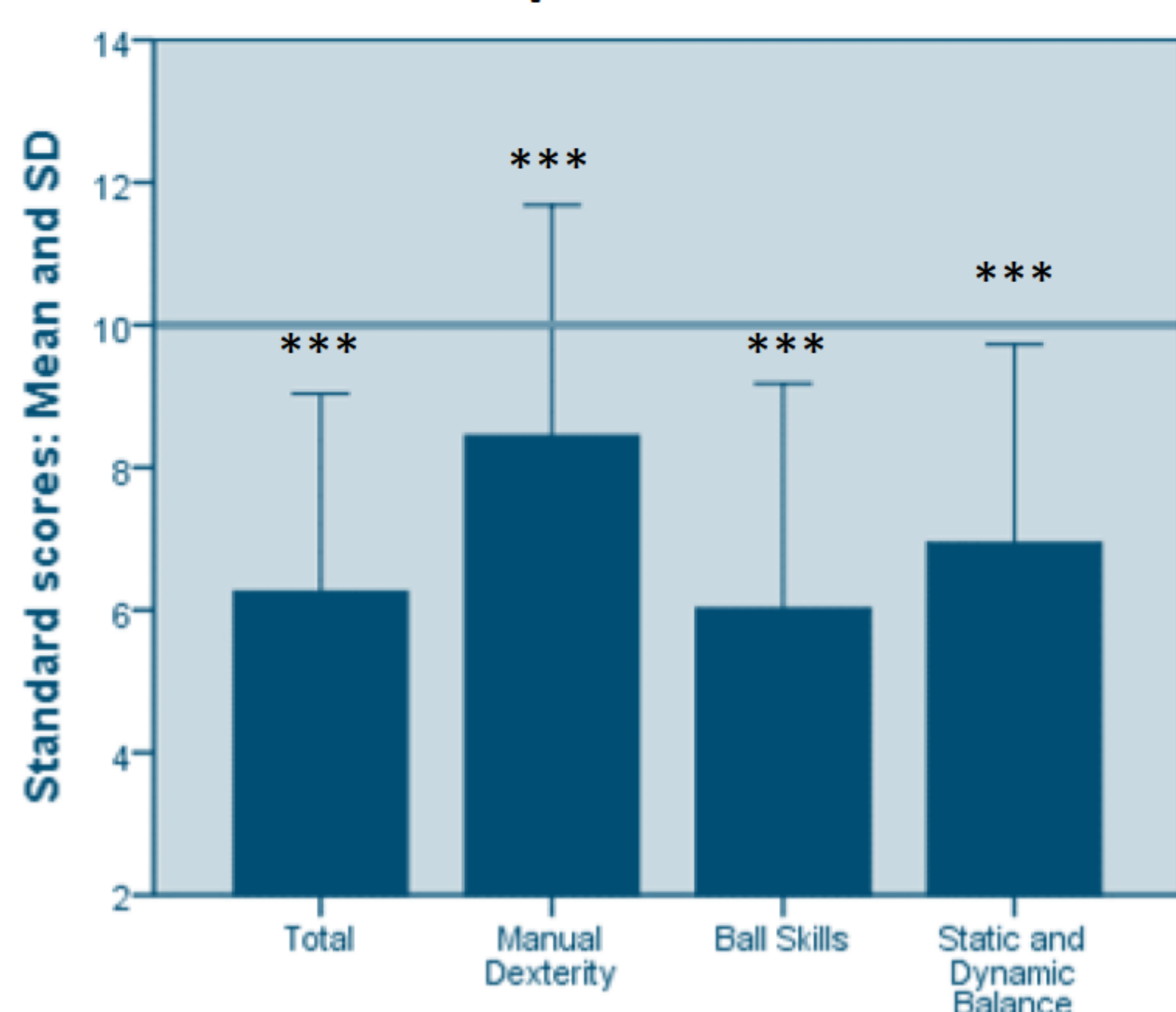
The Developmental Test of Visual Motor Integration (VMI) includes motor and visual perception subtests. The reference value is 100 ± 15 SD.

Results

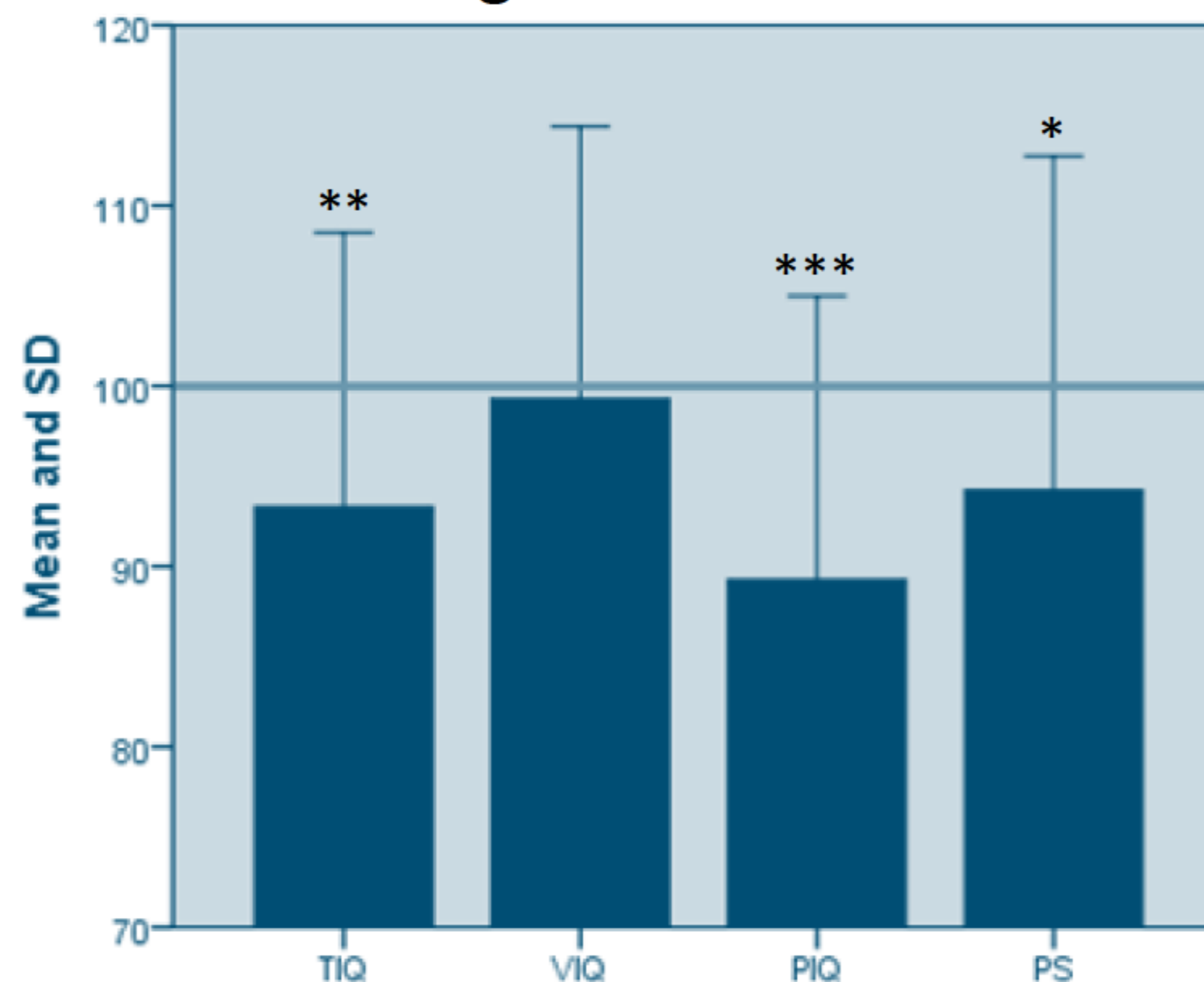
	TIQ	VIQ	PIQ	PS	VMI total	VMI visual perception	VMI motor
MABC-2 Total score	0.299	0.185	0.308 *	0.485 ***	0.374 **	0.402 **	0.393 **

Pearson's correlation coefficients * = p < 0.05, ** = p ≤ 0.01, *** = p ≤ 0.001

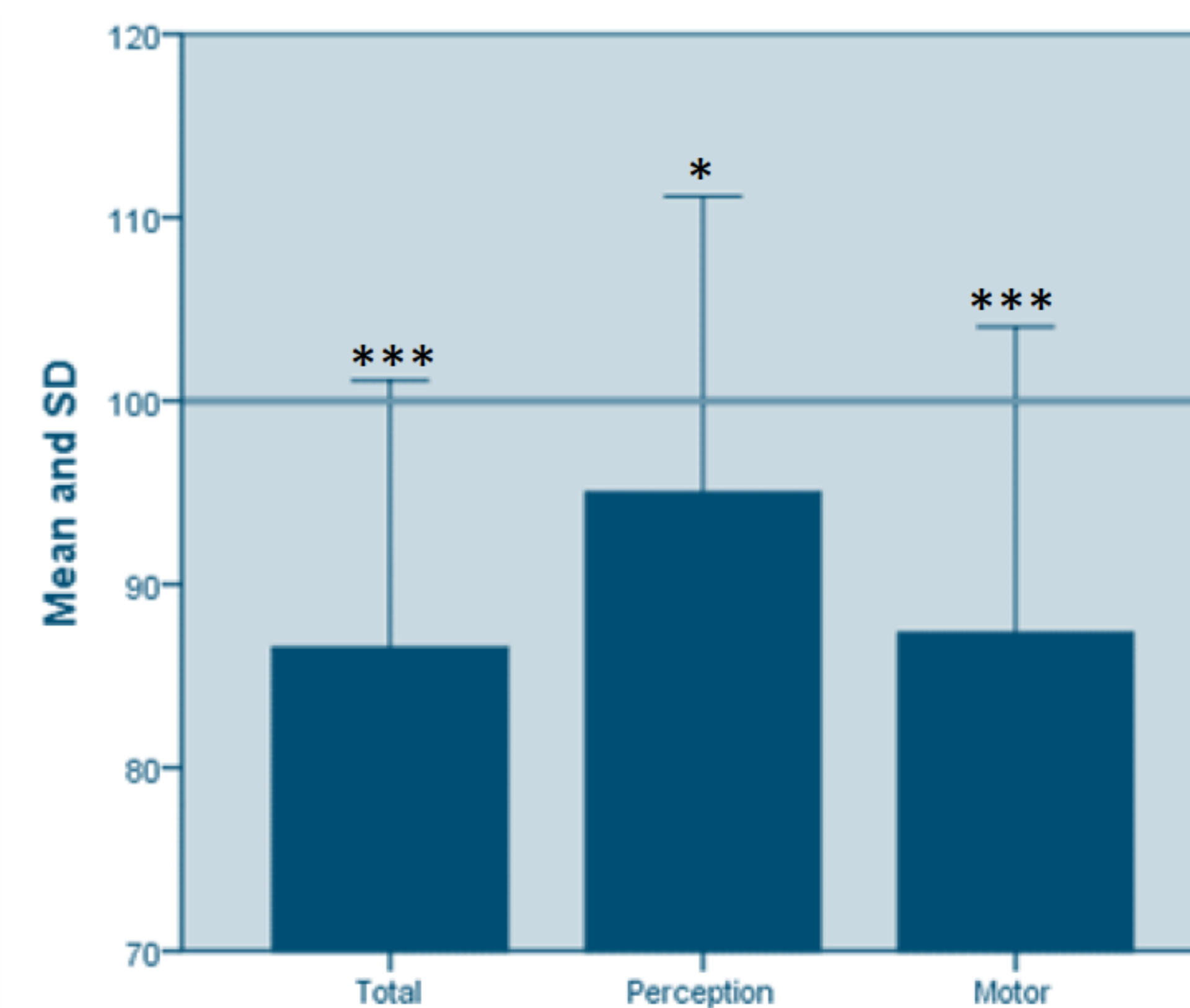
Motor performance



Intelligence scores and PS



VMI



T-test compared to reference values * = p < 0.05, ** = p ≤ 0.01, *** = p ≤ 0.001

Conclusion

Patients with Turner syndrome have a remarkably significant impaired motor performance (mean MABC-2 score -1.25 SD). Patients showed impaired performance on all different subtests and visual-motor integration. We found a strong association between motor performance and processing speed. Furthermore, PIQ and visual-motor integration tests showed a significant positive correlation with motor performance. Whether this is a causal relationship or whether it is related to the fact that motor skills are mandatory for a proper performance of the tests, needs further investigation.

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