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Memory functioning 7 years after severe childhood Traumatic Brain Injury: Results of the TGE 2 cohort

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Figure 1. Evolution of the General Memory Score over time.

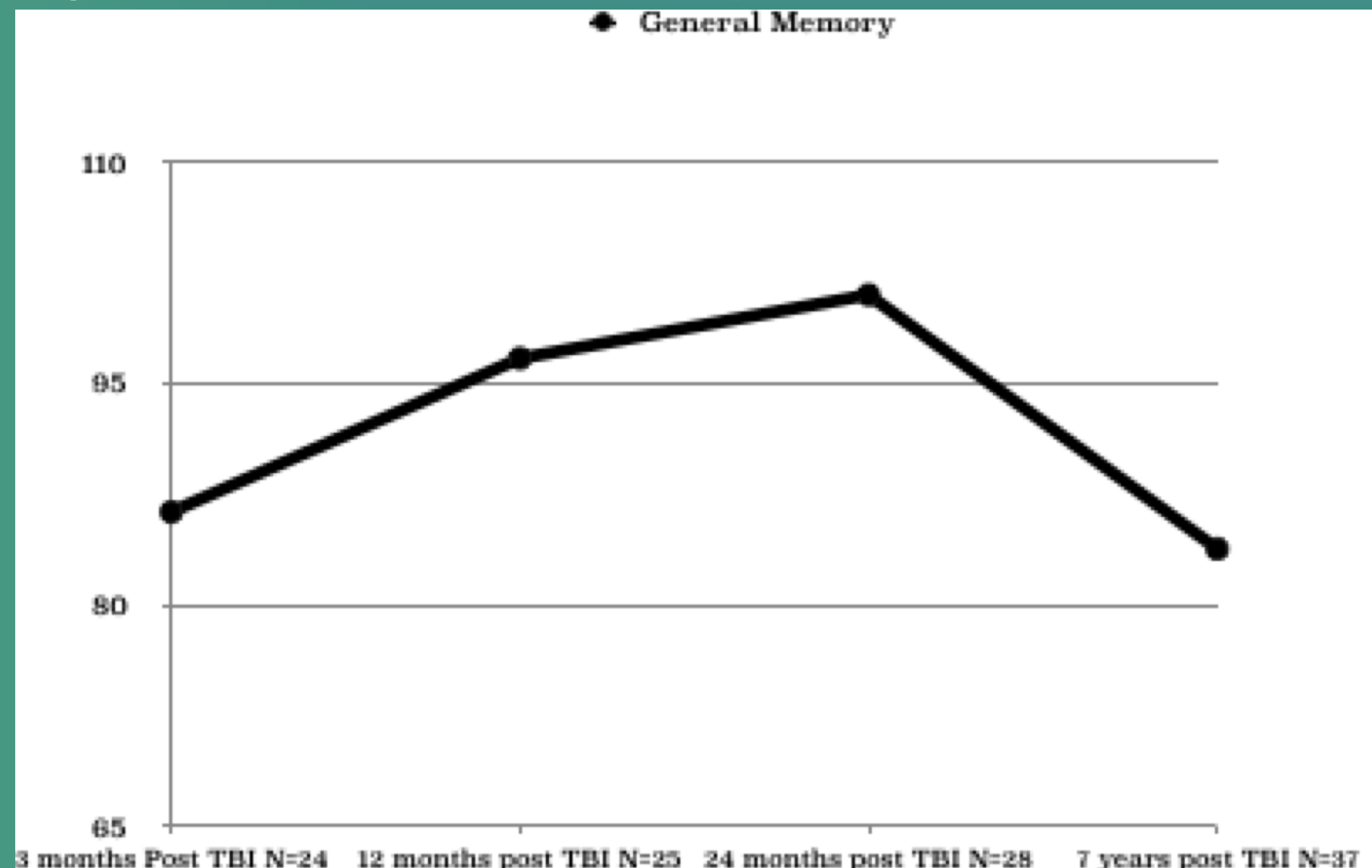


Figure 2. General Memory Score according to initial (3months post-TBI) motor deficit

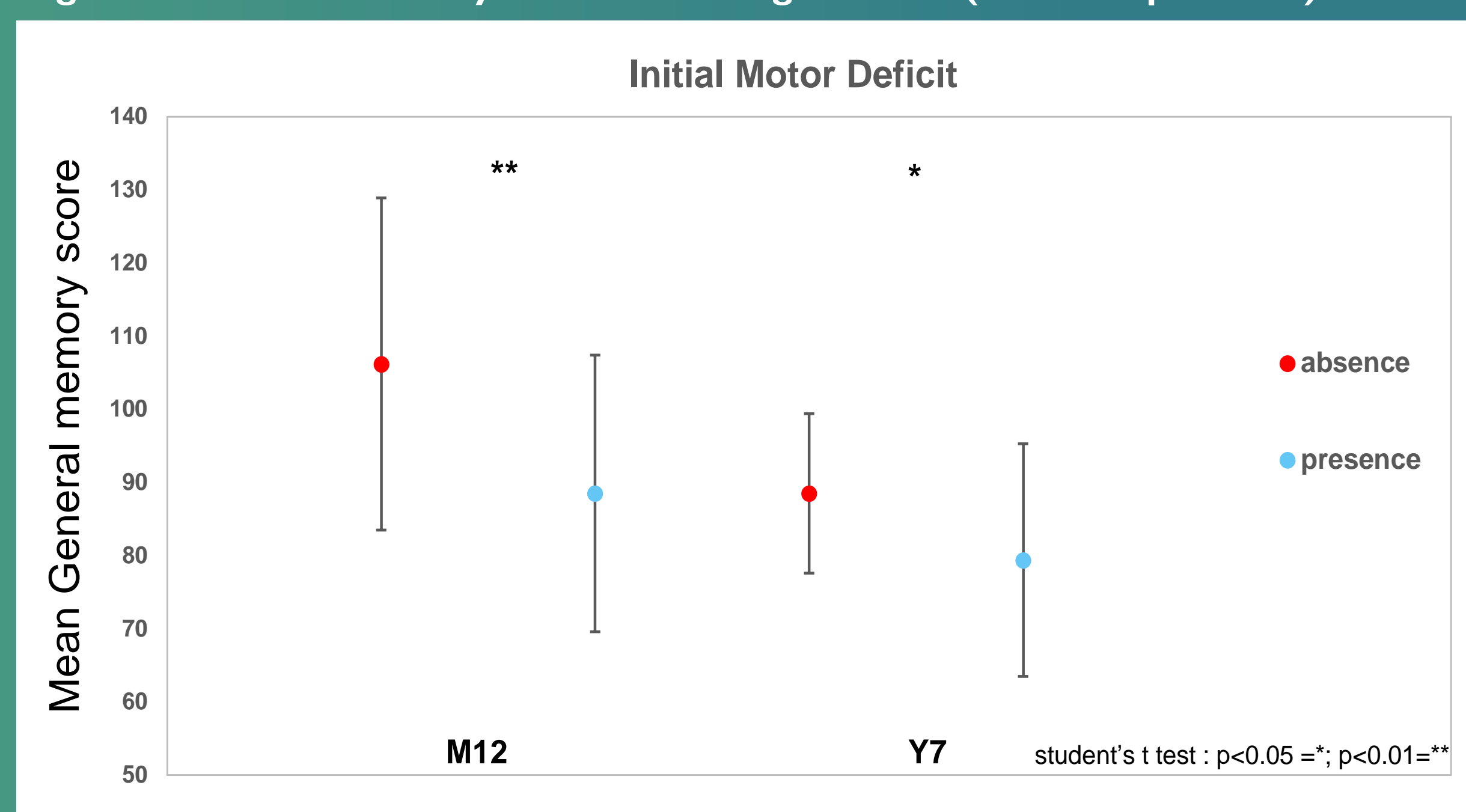


Figure 3. General Memory Score according to overall disability at 12 months.

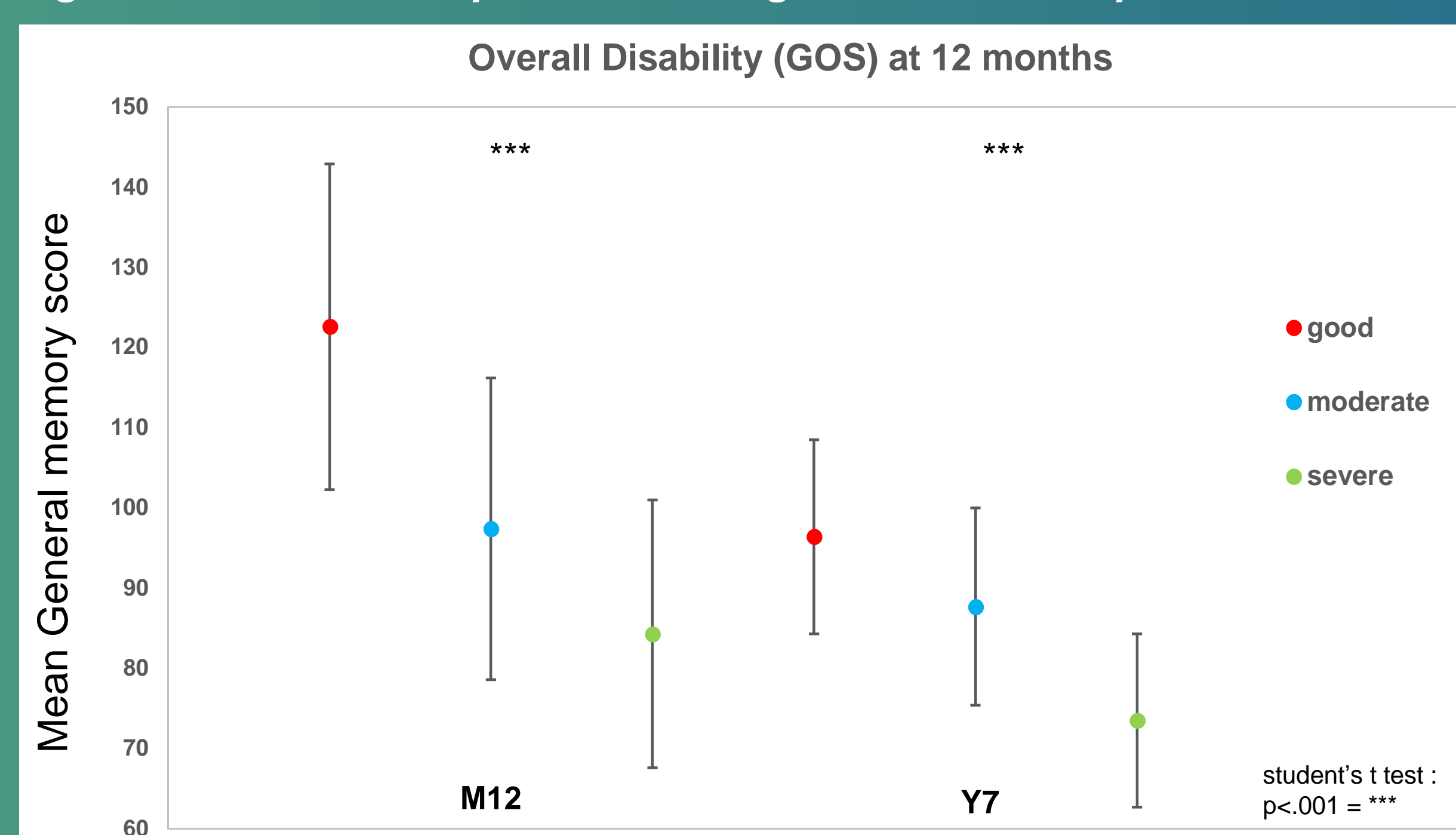


Figure 4. General Memory Score according to ongoing education at 12M and 7Y.

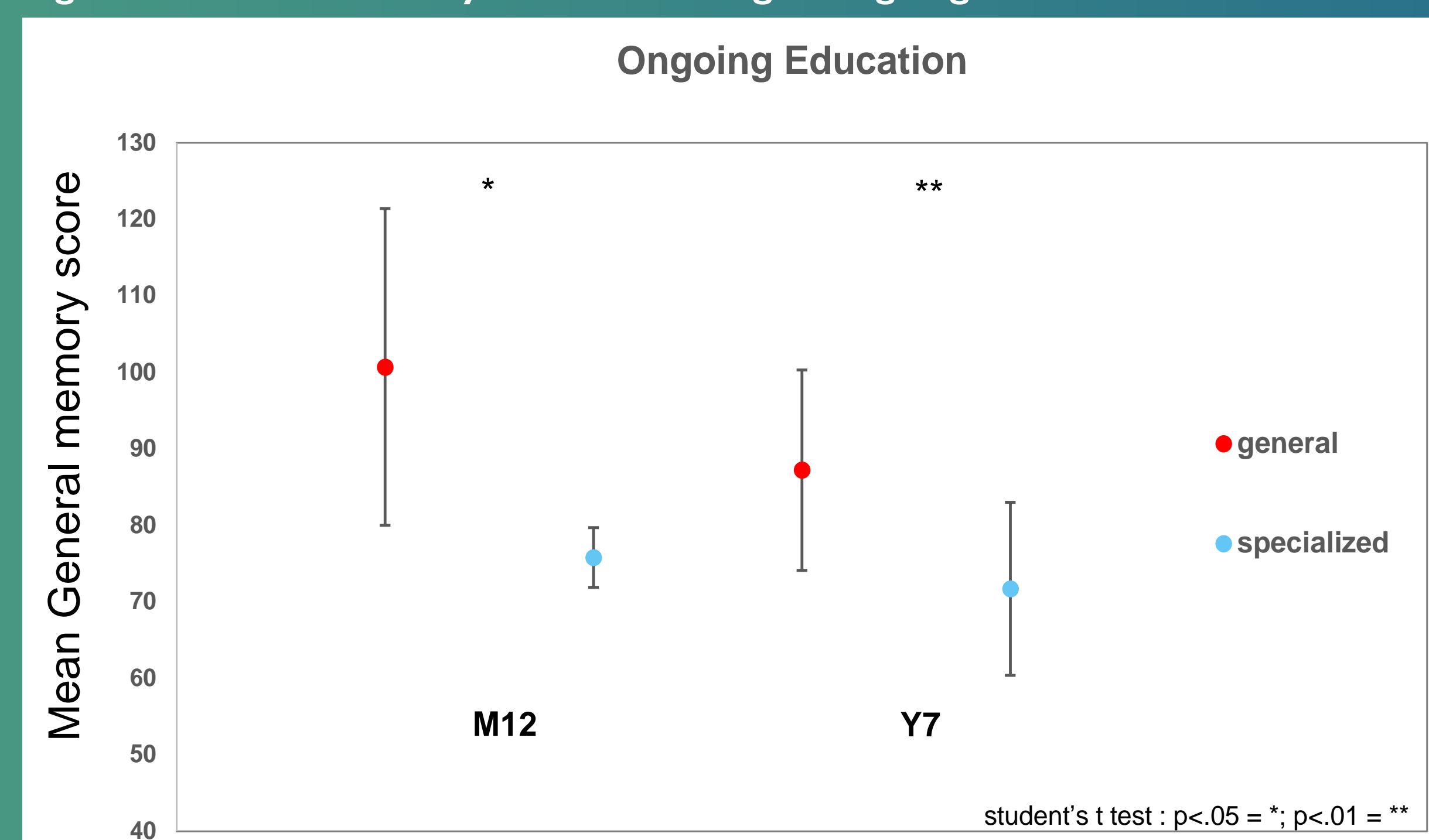
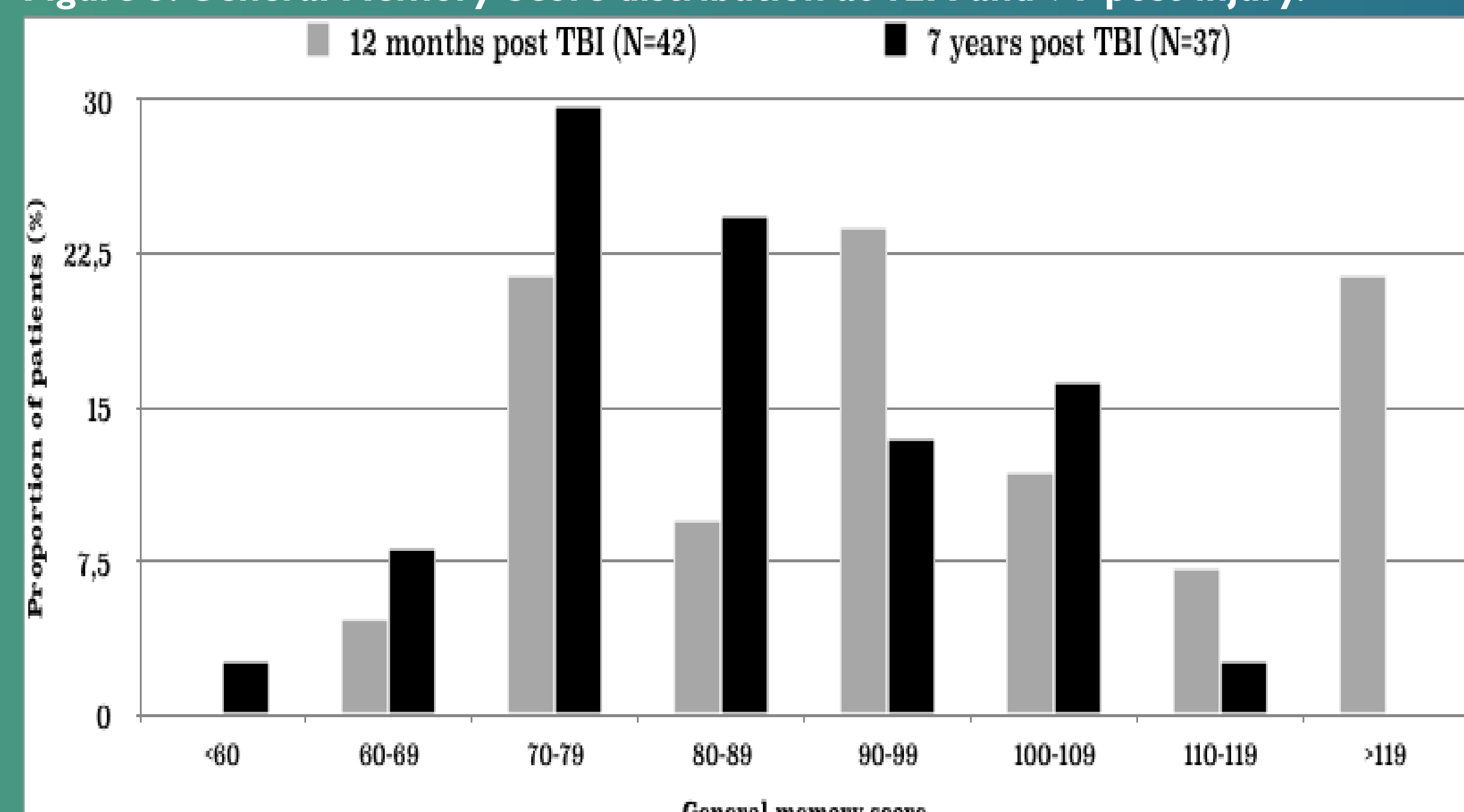


Figure 5. General Memory Score distribution at 12M and 7Y post-injury.



BACKGROUND AND AIMS:

Few studies to date have explored memory functioning in the long term after severe childhood traumatic brain injury (TBI). The aims of this study were:

- (1) to assess memory functioning 7 years after severe childhood TBI;
- (2) to assess demographic and medical factors associated with memory function and recovery;
- (3) to explore relations between memory functions and concurrent TBI outcomes, including subsequent education.

METHODS:

Children (0–15 years) consecutively admitted in a single trauma center, who survived severe, non-inflicted TBI (Glasgow coma scale score ≤ 8) over a 3-year period ($n=65$), were included in a prospective longitudinal study (TGE cohort).

Memory function was assessed initially (3, 12, 24 months) using the Children's Memory Scale (CMS).

Presence of motor deficit and/or signs of cerebellar dysfunction were assessed at each time-point.

At the 7-year follow-up, 37 patients were available for memory assessment, using the CMS (<16 years), or the Wechsler Memory Scale – IV (WMS-IV; ≥ 16 years). Overall disability was assessed using the Glasgow Outcome Scale, and intellectual ability using age-appropriate Wechsler scales.

RESULTS:

Mean general memory score was low at 3 months ($m=89$, $SD=20.5$) but in the normal range at 12 and 24 months ($m=99.1$, $SD=22.7$ and $m=103.9$, $SD=26$, respectively), with an important decrement at 7 years ($m=83.8$, $SD=15.5$), with high variability.

At 7 years, lower general memory score was significantly associated with (1) higher injury severity and persistent motor deficits at 3 months post-injury; (2) lower 1-year post-injury functional outcome and overall disability; (3) lower concurrent intellectual ability, and type of ongoing education. None of the socio-demographic factors (age, age at injury, parental education level) significantly influenced memory outcome in the long term.

CONCLUSION:

Memory functioning is strongly impaired 7 years after severe childhood TBI. It is influenced by injury severity, initial functional and motor outcomes, overall cognitive outcomes and level of disability.

Memory functioning significantly impacts educational outcomes. Despite some improvement during the first two years, memory function tends to decrease over time, probably by lack of age-expected progress over time, supporting the early brain vulnerability theory, and the necessity for systematic long-term follow-up and monitoring in this at-risk population.

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