

Enhanced Attentional Performance Following Pediatric Goal Management Training in Children with Spina Bifida: A Pilot Study

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Background

Executive functioning (EF) refers to complex processes involved in self-regulating behavior. Executive dysfunction causes real-life disability for children with spina bifida (SB). Goal Management Training (GMT) is a cognitive rehabilitation approach for EF deficits [1], and proven efficient in a study of adults with SB [2].

Aim

The purpose of this pilot study was to explore the feasibility and efficacy of a pediatric version of GMT (pGMT). We hypothesized that pGMT would have beneficial effects for executive attention (i.e., attentional control and accuracy) six months post-training.

Materials and methods

Four boys aged 10-12 years with SB were included, based upon the presence of EF problems. The participants received 21 hours of pGMT (see Table 1), including between-session assignments. Treatment compliance was monitored by completed pGMT modules. Instruments administered included Conners' Continuous Performance Test II (CPT-II), Color-Word Interference Test (CWI) and Trail Making Test (TMT).

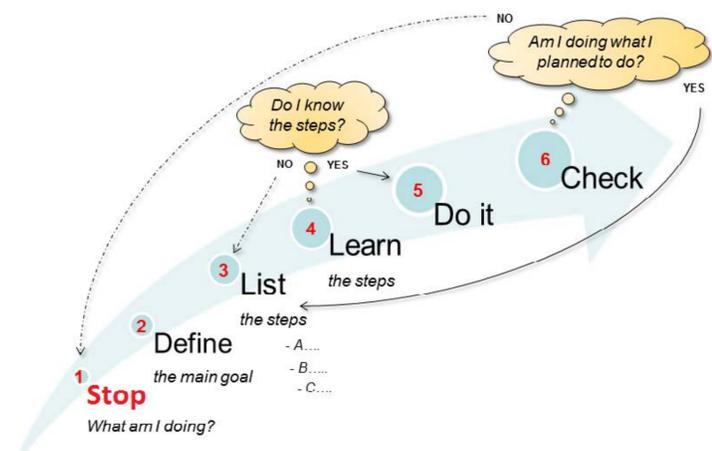


Figure 1. Steps in the metacognitive strategy employed in pGMT.

Results

All subjects completed the seven pGMT modules. Comparisons of pre- and six months post-intervention showed a reduction in CPT-II commission errors, with commissions being reduced from 23 ($SD = 6$) to 16 ($SD = 6$), approaching significance ($p = .07$). A similar trend was found for omission errors ($p = .07$), with omissions reduced from 10 ($SD = 3$) to 4 ($SD = 2$).

A decline in total errors on CWI conditions 3 and 4, and TMT condition 4 was also detected ($p = .07$), with mean total errors reduced from 15 ($SD = 6$) to 5 ($SD = 2$). Effect size estimates indicated overall large training effects ($r = .65$).

All subjects showed a decline in omissions, commissions and total errors (CWI and TMT) six months post-intervention

Conclusions

The results showed that the children improved their executive attention six months post-training. These preliminary results suggest that pGMT should be further explored amongst children with SB. Studies with a larger sample size and stronger design are warranted.

References

1. Levine et al. (2000). Rehabilitation of executive functioning: an experimental-clinical validation of goal management training. *JINS*, 6, 3, 299-312.
2. Stubberud et al. (2013). Goal management training of executive functions in patients with spina bifida: a randomized controlled trial. *JINS*, 19, 672-685.

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Sessions	Key concepts and objectives		Inpatient duration
Module 1:	The absent mind, the present mind	Introduction of goal hierarchies, absentmindedness and present-mindedness	3 days
Module 2:	Absentminded slip-ups	Relation of absentmindedness to other abilities, consequences of slips, conditions for slips	
Module 3:	The automatic pilot	The automatic pilot (i.e., habitual responding) Training to stop the automatic pilot (i.e., stop ongoing behaviour periodically, in order to monitor and adjust goals)	
7 days at home including between session-assignments			
Module 4:	The mental blackboard	Mental blackboard is introduced as a metaphor for working or short-term memory	4 days
Module 5:	State goal	Goal loss and reinstatement (i.e., STATING the goal) Goal conflict and decision-making	
Module 6:	Split tasks into subtasks	Dealing with overwhelming tasks by splitting them into smaller tasks	
Module 7:	Check (Stop!)	Checking (reducing slip-ups) Mindfulness-based exercises to enhance awareness toward current feelings, behaviour and goal states	
Four hours (4 x 1) of pGMT counseling (parent(s) + child) following the intervention during a 2 months period			
One hour of pGMT counseling (teacher) in the same period for each child			
Assessment immediately after intervention and counseling period			
Six months follow-up			

Table 1. Concepts and objectives in pGMT, including intervention procedure.

* Following each module the parents reviewed the session materials with the pGMT therapists

** Following Module 7, all participants received a weekly letter stating "STOP" (a key instruction in GMT), during the counseling period (8 letters in total), to cue goal management in their daily living. The day of cuing changed every week to prevent habituation.