

Rehabilitative training of preterm children's attention: a study on sustainability

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Abstract

This article is concerned with the description of rehabilitative training aimed at severely and moderately preterm children at preschool age who display impairments of processes of selective attention, self-control and problem solving and who are at risk of Attention Deficit Hyperactivity Disorders. In line with a perspective of field study suggested by pediatric psychology, the treatment calls for the involvement of parents, teachers, neonatologists and children's reference pediatricians. To be more precise, it is a study aimed at investigating the sustainability of the training path in terms of impact and transformative valence of the focalised processes.

Involved in the study was a group of 55 healthy preterm children (35 moderately preterm children and 20 severely preterm children) at mean age of 5.2 years attending the third year of infancy school; a group of 55 mothers; a group of 15 pediatricians; a group of 5 neonatologists and one of 10 teachers. Specific questionnaires (the IPDAG and IPDDAI) were administered to parents and teachers before and after the training sessions to detect the transformation of the focalised processes. According to a modality of continuous observation during the activities, the trainer used techniques of narrative (the critical incident technique) and descriptive (encoding scheme) observation.

A checklist to detect the participation of adults was used. It was structured as follows: presence, production and aftermath of the effects of the personal intervention with child. A telephone follow-up was performed three months after the end of training to detect the involved adults' considerations about the stability of promoted changes.

Data show good levels of sustainability of the proposed training.

Keywords

Training, preterm children, Attention Deficit Hyperactivity Disorders (ADHD) risk, preschool age.

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Introduction

This study deals with rehabilitative training aimed at moderately/severely preterm children at preschool age who display disadaptive behaviours due to neurocognitive impairments which studies in the field make it possible to consider as driven by precursors of Attention Deficit Hyperactivity Disorders (ADHD) [1-5]. It is a survey on sustainability of training in terms of impact and transformative valence of the impaired processes such as:

- selective attention processes, which allow focusing on activities without distraction, and processes of sustained or prolonged attention;
- self-control processes, which are processes of behavioural self-regulation, modulation of activities depending on rules and external demands, and of expression of feelings;
- problem solving, which is the skill of solving tasks and activities as analysis of the characteristics of tasks and the search for alternatives useful for finding solutions.

According to the literature [6-9], such processes are precarious in cases of both moderate [10-13] and severe prematurity [14-20]; the same literature shows the need for supporting criticalities within the planned follow-ups and/or developmental monitoring performed by pediatricians.

This rehabilitative path, which was designed by the authors [21-22] according to the collected data that highlight such criticalities, is an extension of the aforementioned literature [23-25]. It can also be considered as an integration since it detects ADHD risk factors early at preschool age, not only in severely preterm children but also in moderately preterm ones [23, 24]. Such data thus suggest addressing the likely developmental problems arising from the interruption of the prenatal developmental path, even when it occurs at the 34th week of gestation.

The training method follows an interdisciplinary model involving Neonatology, Pediatrics and Pediatric Psychology [22, 26]. It is meant as a path that shows not only the impairments detectable at preschool and school age, but also those developmental resources on which it may be

possible to base rehabilitative paths. It also aims at rebalancing the developmental imbalances that cause impairments [27, 28]. The interdisciplinary method provides the approach of field study that involves even the child's caregivers such as parents, teachers, pediatricians and neonatologists (see **Tab. 1**). They, in fact, appear to assure the continuity of the rehabilitative intervention and strengthen its effects [29]. Considering the difficulties of integration of some treatments in the child's everyday life, the interdisciplinary aspect of the training is considered a fundamental element for its positive impact. Moreover, the training was also contextualised at the child's school, considering the educational path of ministerial programs [30]. It is structured as a specific early training course, aimed at preschoolers to develop self-regulation skills such as emotional, cognitive, relational and behavioural ones; at parents, to develop their parental competencies, useful for addressing their child's behavioural problems related to everyday life; at teachers, as specific preschool and school educational paths, to manage didactic strategies oriented to the development of cognitive and meta-cognitive competencies in children.

With regard to neonatologists and pediatricians, the training is designed to promote the monitoring of each child's developmental path not only in terms of impairments, but also of resilience (cognitive, emotional resources), which are the resources to be used.

This study has made it possible to investigate the factors of sustainability of the training (its impact and developmental transformation of the processes) by detecting the indicators of the activated changes.

Training

The training for preterm children at risk of ADHD is structured according to a cognitive-behavioural perspective [31]; it aims at developing or strengthening a child's early cognitive, metacognitive, emotional and social skills, the absence of which places children at risk of the syndrome.

The training implies a path that comprises laboratory interventions to be performed over the course of six months. The interventions are performed according to two perspectives. The first is the cognitive-behavioural perspective that utilises self-instructional procedures [32] aimed at activating self-talk strategies (internal dialogue, self-instruction), self-monitoring [33,

Table 1. Training path for the ADHD risk at preschool age.

Months	Subjects involved			
	Children	Parent	Teacher	Pediatrician/ Neonatologist
1 st month	<ul style="list-style-type: none"> • First meeting • Attention focus group • Self-regulation focus group 	<ul style="list-style-type: none"> • Forum “attention and self-regulation difficulties” • Child’s behaviour observation through the catalogue technique • Laboratories focusing on child’s behavioural repertoire 	<ul style="list-style-type: none"> • Forum on “attention and self-regulation difficulties” • Task-based Laboratory on the guidelines for the prevention of ADHD 	Audit on each child’s pediatric condition concerning his/her birth, the likely follow-ups and first developmental monitoring
2 nd month	Laboratories focusing on the task “knowing the world”	<ul style="list-style-type: none"> • Administration of the Q-sort on parental competence • Task-based laboratories on the connection between educational practices and dysfunctional behaviours of children • Task-based laboratories on the transformation of parental behaviour 	Task-based Laboratory on planning interventions to be activated in the classrooms	Task-based laboratories on intervention with parents
3 rd month	Laboratories focusing on the task “the self and the other”	<ul style="list-style-type: none"> • Homework • Parole with group of parents • Group with teachers and pediatrician/neonatologist on changes in child 	<ul style="list-style-type: none"> • Homework • Group with parents and pediatrician/neonatologist on changes in child 	Group with parents and teachers on changes in child
4 th month	Laboratories focusing on the task “body and movement”	<ul style="list-style-type: none"> • Counselling setting for each parental couple • Group with teachers and pediatrician/neonatologist on changes in child 	<ul style="list-style-type: none"> • Supervision with counselling setting • Group with parents and pediatrician/neonatologist on changes in child 	Group with parents and teachers on changes in child
5 th month	Laboratories focusing on the task “talks and words”	<ul style="list-style-type: none"> • Homework • Group with teachers and pediatrician/neonatologist on changes in child 	<ul style="list-style-type: none"> • Homework • Group with parents and pediatrician/neonatologist on changes in child 	Group with parents and teachers on changes in child
6 th month	Laboratories focusing on “languages, creativity and expression”	<ul style="list-style-type: none"> • Supervision with counselling setting • Administration of the assessment questionnaire • Path feedback 	<ul style="list-style-type: none"> • Supervision with counselling setting • Administration of the assessment questionnaire • Path feedback 	<ul style="list-style-type: none"> • Supervision with counselling setting • Path feedback

34] and problem-solving in children. The second perspective is the metacognitive one which deals with the development of metacognitive sensitiveness [35] and the problem-solving attitude of preschoolers. These skills are proved to be “calibrated”/sized according to the specific cognitive functioning profile of preschoolers, who typically lack higher cognitive processes because of their age. Such missing cognitive processes are the abilities to think about his/her own cognitive modalities and the way of actively managing them

(e.g. the comprehension of make-believe games, recognizing the difference between real objects and mental images), the skill of improving memory strategies and that of comprehending and ascribing mental states to themselves and to others.

The training procedure consists of two stages. The first phase, which lasts four weeks, aims at knowing the issues concerning the path and, at the same time, concerning the representation of self, with respect to attention, self-regulation and problem-solving; the phase of the real treatment,

which lasts five months, aims at stimulating the change in absence of self-regulation, inattention and problem-solving.

This stage implies the activation of specific task-based weekly laboratories (see **Tab. 1**); the procedure applied by these laboratories allows fostering the activation of attention, self-regulation, problem-solving and metacognitive processes through the planning and reporting of a task that implies a child's original production concerning the issues and when they will be tackled. Each month focuses the reference areas of the "experience field" fixed by the Italian Ministry of Public Education (2007), for infancy school (3-6 years of age).

Parent training

The programme calls for parent training aimed at redefining parental competence, useful for the management of the behaviour problems of children at preschool age, which may lead to ADHD at school age. This parent training implies a path that comprises actions in the course of six months, together with each participating parental couple, and a group consisting of up to a maximum of eight couples selected from among them.

The parent training implies an earlier phase performed through the activation of one forum on attention deficit and self-regulation difficulties in children of preschool age, as a group method aimed at exploiting the different perspectives, ideas and representations [22] that every participating parent has about the issue to be addressed. The treatment phase implies the activation, with each parental couple, of an assessment path focused on their child's competences and developmental impairments by means of descriptive techniques of observation. A series of laboratories are activated (task-based laboratories) for parents [22] to help them to build a representative map that connects the child's dysfunctional behaviours with specific educational practices activated by the parents and a counselling setting, involving each parental couple, whose purpose is to find specific educational strategies useful for the proper development of their child.

Each parental couple will do homework that consists of using, in the everyday relationship with their own child, the educational strategies identified during the counselling setting. They will be supervised at a distance by the trainer for one month by means of telephone counselling [36]. During this last phase, the parents will again be administered the tool utilised during the first phase of assessment.

Finally, meetings between teachers and pediatricians will be activated throughout the path to reflect on the child's detected changes.

Teacher training

Also planned is the activation of an information and formative path for the teachers of the reference school of the children involved in the training to be performed during the six-month training period with parents and children. The purpose of such training is to develop specific assessment competences on ADHD to enable teachers to recognize in their pupils the presence of predictors of this disorder. It is also aimed at changing the relationship between teacher and pupil at risk of ADHD and to detect strategies and educational methods useful in developing the cognitive and metacognitive processes that are missing in such pupils.

The teachers' training implies: a forum on preschoolers' attention difficulties and self-regulation, aimed at stimulating a debate on a narrative text concerning the case of a pupil who displays behaviours that may be precursors of ADHD; a task-based laboratory, whose purpose is to set the guidelines for a didactic intervention for prevention of ADHD and to design actions to be performed in the classrooms of the children at risk of ADHD. Homework: experimentation of the designed activities in classroom, as a support of the phase of the training addressed to children and supervision with/through consulting setting. As a conclusion, a questionnaire to detect the perception the teachers have of the changes occurring as a consequence of the training of the children at risk of ADHD and the re-application of the assessment tools administered in the first phase.

Meetings between teachers and pediatricians will be activated throughout the path to reflect on detected changes in the child.

Pediatrician/neonatologist training

Finally, the path calls for the involvement of the family pediatricians and neonatologists, referring to the children participating in the training, as further "actors" in the monitoring phase of attention, self-regulation and problem-solving processes.

Therefore, the training involving pediatricians and neonatologists implies: a meeting to detect the aspects of the pediatric condition of each child and task-based laboratories to define interventions with the child's parents. Groups of teachers and

pediatricians will be activated throughout the path to reflect on changes detected in the child.

The training path was activated within the school setting throughout the school year. At the end, the final restitution of the whole path and a telephone follow-up was performed with involved adults such as parents, pediatricians and teachers. At the beginning of the new school year, an audit was arranged with involved adults for further reflection on the stability of attention and self-regulation behaviours related to the training.

Methods

Study objects and hypothesis

The study investigates the sustainability of the training, which is aimed at a group of severely and moderately preterm children at preschool age (M age: 5.2 years, SD: 5 months), in terms of impact and transformative valence of attention processes that were proved to be impaired. Verified were:

- the presence of statistically significant differences in the attention and self-regulation performances of preterm children involved into the training, before and after the rehabilitative path;
- the level of participation of parents, teachers, pediatricians and neonatologists in the training activities;
- whether the practices and objectives reached last in the child's everyday life three months after the conclusion of training.

Participants

A group of 55 healthy preterm children (**Tab. 2**). This group included 35 moderately preterm children (M: 34.6 weeks' gestational age, SD: 2) without any medical neonatal complications and low birth weight (M: 2,100, SD: 350 g), selected according to the following criteria: gestational age between 34 and 36 weeks, birth weight between 1,500 and 2,500 g without any neurologic pathology, sensorial or genetic pathology deficit nor malformative syndrome; 20 severely preterm (M: 29 weeks' gestational age, SD: 3; birth weight: 1,800 g, SD 150 g, without any pre- and perinatal complications). The selection criteria of severely preterm children were: gestational age < 35 weeks, birth weight 1,500 to 2,500 g without any neurologic pathology, sensorial and genetic pathology deficit nor malformative syndrome. All the children involved were at the average age of 5 years and two months; 90% of them

Table 2. Characteristics of preterm birth children.

Variable	Moderately Preterm Children* (= 35)			Severely Preterm Children* (= 20)		
	Mean	SD	Range	Mean	SD	Range
Child age (months)	62	4	57-67	64	2.5	61-66
Birth Gestational Age	34.6	2	32-35	29	2	27-31
Birth Weight (g)	2,100	350	1,450-2,400	1,800	350	1,450-2,400
Days of Hospitalization	15	8	8-23	25	7	18-32
Mother's age (years)	30.6	6	24-37	32,6	5	28-38
Parental educational attainment (years)	13	8	8-23	12	8	8-22
Number of children	2	1.5	1-3	2	1.5	1-4

* Healthy Preterm (HPT): no medical/neurological complications.

had siblings (two on average), belonged to middle class one-income families with secondary school education on the average. The children attended the last year of Italian pre-school (namely the English equivalent for the first year of primary school) at schools in Palermo and its province. The research group children were involved after their parents had signed the declaration of informed consent according to the D.Lgs. 196/2003 art. 13 related to personal data protection.

A group of parents: 55 mothers.

A group of pediatricians and neonatologists: 15 pediatricians and 5 neonatologists.

A group of teachers: 10 teachers of the reference infancy school of the children involved.

Procedures and instruments

Before and after the training, specific questionnaires were administered to parents and teachers to detect the transformation of the processes focalised by the study:

IPPDDAI Italian scale (*Attention Deficit Hyperactivity Disorder Early Detection for Teachers*) [37], a specific questionnaire, articulated in 18 items, which makes it possible to investigate distraction and hyperactivity symptoms in children

5 to 6 years old attending the equivalent of the English first year of primary school. The children's reference teachers filled in the questionnaire. They were asked to evaluate how frequently they detected certain skills and behaviours shown by children in the classroom by means of Likert-type Scale 4 response levels (0 = not at all/never; 1 = rarely/sometimes; 2 = quite frequently/most of the time; very frequently/always). The 14 items of the questionnaire refer to the dimensions of *disattention*, intended as the difficulty the child has in focusing on details and prolonging his/her attention during an activity and of *hyperactivity/impulsivity*, intended as motor skills, restlessness and self-control and self-regulation disorders. The last four items are related to the likely risk factors that may affect the persistency, grade and development of ADHD symptoms such as a socio-cultural disadvantage, poor cognitive potentialities, presence of emotional and/or relational impairments and likely family troubles. The analysis of data made it possible to distinguish scores related to each subscale (*disattention* and *hyperactivity/impulsivity*). The instrument was designed according to the Italian normative sample.

IPDDAG Italian Scale (*Attention Deficit Hyperactivity Disorder Early Detection for Parents*) [38], a specific questionnaire, aimed at detecting subjects defined as "at risk" of ADHD, during pre-school age, performed through the assessment of parents. To be more precise, the questionnaire was administered to parents of children attending the last year of Italian pre-school, namely the English equivalent for the first year of primary school. Parents were asked to evaluate, through the Likert-type scale 4 response levels (0 = not at all/never; 1 = rarely/sometimes; 2 = quite frequently/most of the time; very frequently/always), how frequently they had observed the behaviour that their children display at home. The questionnaire was made up of 14 items expressed in a negative form, whose odd items refer to disattention, related to the difficulty the child has in prolonging his/her attention on an activity and games at home, while the evens refer to *impulsivity/hyperactivity* intended as motor restlessness and self-control and self-regulation disorders. Five more final items are also to be considered related to risk factors (forms of socio-cultural disadvantage, poor cognitive potentialities, presence of emotional and/or relational impairments and likely family troubles). The content of items refers to other previous questionnaires, namely the IPDDAI and SDAG scales (addressed to parents

to assess disattention and hyperactivity behaviour of children at school age) and DSM-IV criteria. It has to be specified that the higher the score is, the greater the occurrence of pathognomonic tracts of the disorder.

Observation techniques: according to a modality of continuous observation during the activities, the trainer also used the critical incident technique [39], by means of which the presence of behaviours related to selective attention, self-regulation and problem-solving processes were recorded. At the end of training, an encoding scheme structured according to the latter three indicators was applied to allow evaluation of the monthly presence of the processes and their related trend of development throughout the whole training programme.

Finally, to detect the participation of adults, the trainer used a check-list structured according to the following factors with dichotomous response choices (yes – no): attendance, individual production (questions, comments, hypothesis) and aftermath of the personal intervention with the child (recalling of actions connected with attention processes that the child performs in other settings; reinforcement of these actions, hypothesis of situations that can transform such actions). The scoring procedure was planned to calculate the mean expected frequencies of each indicator diversified according to the type of subjects involved (55 mothers, 20 physicians and 10 teachers) and the number of meetings for each typology (meetings: 12 for the mothers; 9 for the teachers and 7 for the physicians). At the end of training the expected values were compared to those actually detected in the focalised subjects. Therefore, it was possible to define the profile of participation of the adults involved creating two levels of participation: inadequate in the case of low values (presence, production and aftermath lower than the average value); adequate in the case of more or less medium values (presence, production and aftermath equal to the average value).

Furthermore, a telephone follow-up was performed three months after the end of training to obtain the opinions of involved adults.

Results and discussion

The Statistical Program for Social Sciences – SPSS 16 was used to analyze the codified data.

A repeated measures analysis of variance (ANOVA) (model within subjects) was performed to assess the statistically significant differences in the attention and self-regulation performances of preterm

children, before and after the rehabilitative training. This made it possible to compare the performances related to a child's attention (Inattention scale) and self-regulation (Hyperactivity/Impulsivity Scale) detected by parents (IPDAG) and teachers (IPDDAI) before and after training programme, considering the differences between moderately and severely preterm children.

An analysis of the visual trend of change was also performed to detect the mean frequencies of behaviours displayed by children during the six months of training.

With regard to data on participation, descriptive statistics was used.

The data collected by parents (IPDAG) show a statistically significant decrease in both the processes of inattention ($F = 137.7_{(1, 54)}$, $p < .001$, $\eta^2 = .72$) and self-regulation of hyperactivity and impulsivity ($F = 127.7_{(1, 54)}$, $p < .001$, $\eta^2 = .71$); in this sense, at the end of the course the children who participated in the training had lower scores of inattention and impulsivity (**Tab. 3**).

Table 3. ADHD precursors assessed by parents and teachers.

Scales	Mean (SD) before training	Mean (SD) after training
Mothers - IPDAG Questionnaire		
Inattention in PT	6.9 (5.9)	5.3 (5.4)
Inattention in MPT	7 (5.6)	5.4 (5.2)
Inattention in SPT	6.5 (6.8)	5.2 (6.1)
Hyperactivity/Impulsivity in PT	9.2 (6.7)	8.5 (6.3)
Hyperactivity/Impulsivity in MPT	10.2 (6.6)	9.4 (6.3)
Hyperactivity/Impulsivity in SPT	6.7 (6.4)	6 (6.1)
Teachers - IPDDAI Questionnaire		
Inattention in PT	6.25 (5.4)	4.7 (4)
Inattention in MPT	6 (5.1)	4.4 (4.6)
Inattention in SPT	6.9 (6.4)	5.6 (5.6)
Hyperactivity/Impulsivity in PT	6.4 (6.1)	5.9 (6)
Hyperactivity/Impulsivity in MPT	6.2 (6)	5.7 (6)
Hyperactivity/Impulsivity in SPT	7 (6.4)	6.6 (6.4)

Data were also confirmed by the assessment of teachers (IPDDAI) which show, at the end of the rehabilitative path, a statistically significant transformation for both attention ($F = 131.8_{(1, 54)}$, $p < .001$, $\eta^2 = .71$) and self-regulation processes ($F = 135.3_{(1, 54)}$, $p < .001$, $\eta^2 = .72$) (**Tab. 3**). No significant effect connected with birth is present; therefore, severely preterm children did not differ from the moderately preterm ones for attention or for hyperactivity, before and after the training.

The transformative effect is also shown by the analysis of visual trends of the frequencies of behaviours related to attention, self-regulation and problem-solving detected by the trainer during each meeting throughout the six months (**Fig. 1**). A constant increment of all processes focalised throughout the entire training period was evident in every child, with the best performances (compared to those in the first month) in relation to attention and self-regulation; problem-solving processes, instead, appeared to be less influenced by the training.

Data of the check-list about the adults' participation (parents, pediatricians, neonatologists and teachers) show a very high level of participation in training sessions. There is, in fact, a high attendance by all subjects (3% of absences), an adequate individual production and a high level of aftermath of personal intervention with the child (frequencies higher than the number of subjects) (**Tab. 4**). Moreover, during the telephone follow-up performed three months after the end of training,

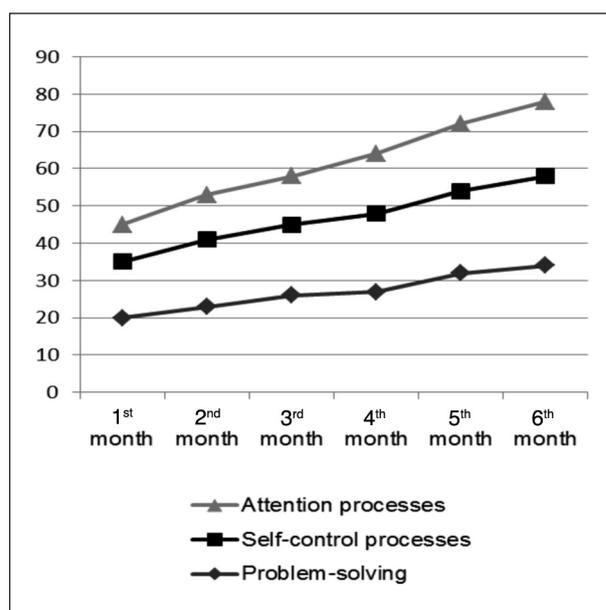


Figure 1. Visual trend of attention and self-control processes.

Table 4. Levels of participation in training sessions.

Subjects	Participation factor	Mean of expected frequencies	Adequacy range		Mean of observed frequencies
			Adequate	Inadequate	
Mothers	Production	165	< 82	≥ 82	110
	Aftermath	165	< 82	≥ 82	125
	Attendance	55	< 55	≥ 55	70
Teachers	Production	30	< 15	≥ 15	20
	Aftermath	30	< 15	≥ 15	25
	Attendance	10	< 5	≥ 5	10
Pediatricians/Neonatologists	Production	60	< 30	≥ 30	40
	Aftermath	60	< 30	≥ 30	50
	Attendance	20	< 10	≥ 10	17

every subject confirmed the lasting and stability of changes.

Conclusion

Considering all data, it appears possible to note good levels of sustainability of the proposed training and suggest always hypothesizing, in cases of ADHD risks at preschool age, the activation of rehabilitative paths that involve every field of reference of preterm children.

A more analytical reflection on transformative outcomes of the training allows us to confirm the plasticity of reference processes of attention and, at the same time, suggests that every involved professional (psychologist, pediatrician, neonatologist, etc.) should consider rehabilitative training a prime element in any support for severely and moderately preterm children. It also shows the importance of contextualizing rehabilitative paths within settings of a child's everyday life.

To be pointed out is the possibility of activating early pre-emptive interventions and considering preterm children's follow-ups and developmental monitoring performed by pediatricians, in terms of connection with rehabilitative paths.

Finally, the methodological framework should be reinforced by means of conclusive meta-experiential and function-based cross-sections to allow children to memorize the experience of

self-regulation and selection to enable them to hypothesize new supporting strategies.

Declaration of interest

No conflicts of interest exist.

References

1. Kinney HC. The near-term (late preterm) human brain and risk for periventricular leukomalacia: a review. *Semin Perinatol.* 2006;30(2):81-8.
2. Krain AL, Castellanos FX. Brain development and ADHD. *Clin Psychol Rev.* 2006;26:433-44.
3. Byrne SM, Bawden HN, Beattie TL, De Wolfe NA. Preschoolers classified as having attention-deficit hyperactivity disorder (ADHD): DSM-IV symptom endorsement patterns. *J Child Neurol.* 2000;15(8):533-8.
4. Lawson KR, Ruff HA. Early focused attention predicts outcome for children born prematurely. *J Dev Behav Pediatr.* 2004;25(6):399-406.
5. McGrath MM, Sullivan M, Devin J, Fontes-Murphy M, Barcelos S, DePalma JL, Faraone S. Early precursors of low attention and hyperactivity in a preterm sample at age four. *Issues Compr Pediatr Nurs.* 2005;28(1):1-15.
6. Theunissen NCM, Veen S, Fekkes M, Koopman HM, Zwiderman KAH, Brugman E, Wit J. Quality of life in preschool children born preterm. *Dev Med Child Neurol.* 2001;43(7):460-5.
7. Aylward GP. Neurodevelopmental outcomes of infants born prematurely. *J Dev Behav Pediatr.* 2005;26(6):427-40.

8. Bhutta AT, Cleves MA, Casey PH, Cradock MM, Anand KJ. Cognitive and behavioural outcomes of school-aged children who were born preterm: a meta-analysis. *JAMA*. 2002;288(6):728-37.
9. Biasini A, Fantini F, Neri E, Stella M, Arcangeli T. Communication in the neonatal intensive care unit: a continuous challenge. *J Matern Fetal Neonatal Med*. 2012 May 10. [Epub ahead of print]. doi: 10.3109/14767058.2011.648241.
10. Chyi LJ, Lee HC, Hintz SR, Gould JB, Sutcliffe TL. School outcomes of late preterm infants: special needs and challenges for infants born at 32 to 36 weeks gestation. *J Pediatr*. 2008;153(1):25-31.
11. Huddy CL, Johnson A, Hope PL. Educational and behavioral problems in babies of 32-35 weeks gestation. *Arch Dis Child Fetal Neonatal Ed*. 2001;85(1):F23-8.
12. van Baar AL, Vermaas J, Knots E, de Kleine MJ, Soons P. Functioning at school age of moderately preterm children born at 32 to 36 weeks' gestational age. *Pediatrics*. 2009;124(1):251-7.
13. Heinonen K, Räikkönen K, Pesonen AK, Andersson S, Kajantie E, Eriksson JG, Wolke D, Lano A. Behavioural symptoms of attention deficit/hyperactivity disorder in preterm and term children born small and appropriate for gestational age: a longitudinal study. *BMC Pediatr*. 2010;10:91.
14. Foulder-Hughes LA, Cooke RW. Motor, cognitive, and behavioural disorders in children born very preterm. *Dev Med Child Neurol*. 2003;45(2):97-103.
15. Anderson PJ, Doyle LW; Victorian Infant Collaborative Study Group. Executive functioning in school-aged children who were born very preterm or with extremely low birth weight in the 1990s. *Pediatrics*. 2004;114(1):50-7.
16. Clark CA, Woodward LJ, Horwood LJ, Moor S. Development of emotional and behavioral regulation in children born extremely preterm and very preterm: biological and social influences. *Child Dev*. 2008;79(5):1444-62.
17. Delobel-Ayoub M, Arnaud C, White-Koning M, Casper C, Pierrat V, Garel M, Burguet A, Roze JC, Matis J, Picaud JC, Kaminski M, Larroque B; EPIPAGE Study Group. Behavioural problems and cognitive performance at 5 years of age after very preterm birth: the EPIPAGE Study. *Pediatrics*. 2009;123(6):1485-92.
18. Hack M, Taylor HG, Schluchter M, Andreias L, Drotar D, Klein N. Behavioral outcomes of extremely low birth weight children at age 8 years. *J Dev Behav Pediatr*. 2009;30(2):122-30.
19. Stoelhorst GM, Martens SE, Rijken M, van Zwieten PH, Zwiderman AH, Wit JM, Veen S; Leiden Follow-Up Project on Prematurity. Behaviour at 2 years of age in very preterm infants (gestational age < 32 weeks). *Acta Paediatr*. 2003;92(5):595-601.
20. Strang-Karlsson S, Räikkönen K, Pesonen AK, Kajantie E, Paavonen EJ, Lahti J, Hovi P, Heinonen K, Järvenpää AL, Eriksson JG, Andersson S. Very low birth weight and behavioral symptoms of attention deficit hyperactivity disorder in young adulthood: the Helsinki study of very-low-birth-weight adults. *Am J Psychiatry*. 2008;165(10):1345-53.
21. Perricone G, Morales MR, Polizzi C. Developmental outcomes of preterm birth: cognitive and behavioural problems in moderately preterm children at preschool age. In: Contreiras D, Sampaio J. *Preterm Infants. Development, Prognosis and Potential Complications*. NY, USA: Nova Science Publishers, 2012.
22. Perricone Briulotta G. *Psicologia Pediatrica. Dalla teoria alla pratica evolutivo-clinica*. Milano: McGraw-Hill, 2012.
23. Perricone G, Morales MR, Anzalone G. School readiness of moderately preterm children at preschool age. *Eur J Psychol Educat*. 2012, in press.
24. Perricone G, Morales MR. Prerequisiti e indicatori di difficoltà di apprendimento in bambini moderatamente pretermine di età prescolare. *Ricerche di psicologia*. 2011;1:23-38.
25. Perricone G, Morales MR. The temperament of preterm children. *Ital J Pediatr*. 2011;37:4.
26. Perricone G. Pensare la psicologia pediatrica. In: Polizzi C. *Pensarsi psicologo pediatrico. Modelli, percorsi e strategie di una formazione*. Milano: Franco Angeli, 2011.
27. Perricone G, Polizzi C, Morales MR, Lorito M, Gumina MG, Arena E. [School in hospital: an opportunity for the hospitalized child to overcome the illness risk]. [Article in Italian]. *Minerva Pediatr*. 2004;56(4):431-44.
28. Perricone G, Morales MR, Polizzi C, Fontana V. [Narrative inquiries representations and self-esteem in the child affected by tumor: a pre-test pilot study]. [Article in Italian]. *Minerva Pediatr*. 2010;62(1):43-50.
29. Perricone G, Polizzi C, Morales MR, Marino S, Favara Scacco C. Functioning of family system in pediatric oncology during treatment phase. *Pediatr Hematol Oncol*. 2012 Jun 25. [Epub ahead of print]. doi: 10.3109/08880018.2012.695439.
30. Ministero della Pubblica Istruzione. Indicazioni per il curricolo per la scuola dell'infanzia e il primo ciclo d'istruzione (D.M. 31/07/2007). Retrieved from: www.pubblica.istruzione.it.
31. Kirby E, Grimley L. *Understanding and treating attention deficit disorder*. USA: Pergamon Books, 1986.
32. Horn WF, Ialongo NS, Pascoe JM, Greenberg G, Packard T, Lopez M, Wagner A, Puttler L. Additive effects of psychostimulants, parent training and self-control therapy with ADHD children. *J Am Acad Child Adolesc Psychiatry*. 1991;30(2):233-40.
33. Kendall PC, Braswell L. *Cognitive-Behavioral Therapy for Impulsive Children*. New York: Guilford Press, 1985.
34. Braswell L, Bloomquist ML. *Cognitive Behavioral Therapy with ADHD Children*. New York: Guilford Press, 1991.
35. Cornoldi C, De Beni R; Gruppo MT. *Imparare a studiare - 2*. Trento: Erickson, 2002.
36. Polizzi C, Morales MR. I costrutti di rappresentazione dei genitori nell'ospedalizzazione pediatrica. In: Perricone G, Di Maio MT, Nuccio FR. *Raccontando Aladino... Vincoli*

e possibilità del lavoro psico-socio-educativo in pediatria. Milano: Franco Angeli, 2008.

37. Marcotto E, Paltenghi B, Cornoldi C. La scala IPDDAI: contributo per la costruzione di uno strumento per l'identificazione precoce del disturbo da deficit di attenzione e/o iperattività. *Difficoltà di apprendimento*. 2002;8(2):153-72.
38. Riello M, Re AM, Cornoldi C. Costruzione di uno strumento rivolto alla famiglia per l'identificazione precoce del DDAI. *Disturbi di attenzione e iperattività*. 2005;1(1):9-26.
39. Perricone Briulotta G. *Agire l'osservazione. Modelli e percorsi*. Milano: McGraw Hill, 2003.