PROFESIONAL - FAMILY INTERCTIONS IN DYSCALCULIA TREATMENT

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ABSTRACT

This article discusses the problems of professional - family interactions in the treatment of dyscalculia. Some of the symptoms, teamwork prerequisites, and specific recommendations for effective performance are presented.

"Dyscalculia" is related with difficulties in performing mathematical operations, or "mathematical disabilities", or "a specific learning disability in mathematics". The term "dyscalculia syndrome" is also commonly used. People who have problems with mathematical operations also have other characteristics, other symptoms, related with day-to-day functioning. They can read, comprehend, work on solving problems, but instead of remembering and elaborating materials, problem solving strategies, they mysteriously forget and run into panic situations, sometimes even within an hour. They often exhibit a high degree of anxiety or are frustrated by failure to handle mathematical information, although they have excellent achievements using linguistic information in other fields. They can also perfectly handle graphical stimuli, such as letters and notes, but their inability to build up a socially adequate concept of solving problems often involves them into conflict situations.

Developmental dyscalculia is manifested when there is a disproportion between the developmental level, the general cognitive capabilities, and the specific mathematical capabilities.

Quantitative dyscalculia is a deficit in the skills of counting and calculating. It is the result of difficulties in the comprehension of operational instructions and/or rules.

Undoubtedly, these difficulties are initially noticed in the learning process, but they also affect everyday activities, such as time planning, evaluation, measurement, shopping, etc. In this context, the difficulties in mastering and implementing mathematical operations generate impediments not only in the school and social performance, but also turn out to be both a result of, and a

prerequisite for emotional, interpersonal, and social issues. The social functioning and integration of people with dyscalculia are problematic and uncertain.

There are strict criteria identifying people with such disabilities. At the same time, however, these disabilities do not require special assistance. The most common cases are:

- Poor visual processing – they find it hard to visualize numbers, figures, and mathematical situations. When a person has general disabilities in terms of visualization, most often we have at hand nonverbal learning difficulties. When there exist difficulties in writing and spelling, dysgrafia may be present;
- Sequencing problems – facts and formulae for complete mathematical operations are most difficult to remember. These issues can be related either with dyslexia, or with disgrafia
- Mathematical "phobia" – most often resulting negative experience in the past or due to lack of self-control or motivation, or demonstrated didactic and educative errors made by teachers and parents.

Dyscalculia, impaired learning ability related with mastering mathematical skills, is characterized by:

- difficulties in discriminating, recognizing, and mastering the meaning of numbers and symbols (especially when there are similarities in the graphical notation), positive and negative numbers, symbols and terms (±, ÷),
- orientation difficulties: left-right, before-after, up-down,
- poor time management skills,
- inattentive performance of activities or mathematical problems; when monitoring is applied, mistakes are independently identified and corrected,
- difficulties in writing and copying numbers, specific symbols, depicting shapes and figures, in writing numbers under dictation; misplaced decimal separator,
- wrong or imprecise writing, handwriting is unsteady, with tremor, with pressure that is either too strong, or too light /hardly discernible/,
- difficulties with handling small objects or in small spaces,
- problems with counting in a series, in auditory perception of numeric models or mathematical problem statements, in performing oral activities and solving word problems; difficulties with grasping mathematical laws, facts and rules,
- difficulties with the sequential steps in algorithms; when applying algorithms, certain steps are omitted or ignored,

- failure to understand mathematical problem statements due to language, speech, or dyslexic problems,
- difficulties with comparing volumes, sizes, shapes, amounts,
- problems with the choice, interpretation, structuring, and generalization of strategies,
- difficult or impossible completion of a task that has been started; waste of working space on the page or shortage and deficit of time due to poor concentration, or external distracters,
- difficulties with recognizing notions and inferencing,
- failure to recognize the correct logical structure of definitions and rules,
- misuse of mathematical terms (e.g. ray vs. segment, line vs. segment),
- difficulties with finding equations, greater than, less than, etc.

It is teamwork that can make possible the success of therapeutic activities and developing socially competent behaviour in people with dyscalculia. Building a team, from such therapeutic and integrative aspects, involves both parents and family members, and professionals. A team is in place when an existing group of people has developed a high level of interaction between its members to establish trust and transparency in the performance of a certain activity or task. It is these social relations that constitute a crucial and irrevocable condition for efficiency of the activities. In cases when things are left exclusively to the efforts of the parents or of the professionals, no favourable forecast or socially effective functioning can be expected.

Teams can be made up both within a certain group, e.g. between a parent and a therapist, a parent and a teacher, etc., and between different groups, where the activities are externally dependent, e.g. family members and a couple of professionals. In this context, teams can be intra-institutional and inter-institutional. Two common fundamental elements of teamwork can be outlined for both formats. To these, we can attribute the following:

- network of aims or a specific goal;
- development of interpersonal relations between team members;
- analysis of the clarity of the role of each team member and his or her responsibilities;
- the team building process. This element requires continuous analysis within the context of the SWOT analysis.

Of crucial importance is the right way of building a team, and not an attempt to make up a team based on casual acquaintances. Different teams have their distinguishing elements. For example, a team made up of parents and teachers, and another one made up of parents and psychologists, or a team of parents and social workers, differ in terms of style of work, performance

standards, vision and mission, mechanism of operation of the team. Hence, the specific elements and issues of teamwork. For instance, such specific elements are the development of the team, as confrontation may occur and the team can disintegrate or continue to exist only formally. For example, when there is no progress toward success, teamwork involves joint implementation.

The process of functioning of a family-parent team involves:

- setting specific goals, deadlines, and responsibilities;
- identifying the obstacles, the inhibitors to reach these goals;
- selecting activities that require a network of certain skills and which are needed for the treatment and the building of social skills;
- inputting resources /information, processes, people's potential/ to facilitate the achievement of the goal, while seeking and identifying all aspects of use of an attractive and diverse pool of activities that are appealing to people with dyscalculia;
- using building processes /health status, leadership, performance leadership, feedback/ in the correct order, planning and implementing activities which are binding, while the original parallels with work are relevant to the set goal;
- using independent facilitators as school advisors or school managers to monitor the quality of implemented activities;
- redefining the processes in place in order to establish a connection with self-regulated learning and acquisition of certain cognitive and social models by the people with dyscalculia;
- using mechanisms for transfer of knowledge from therapist practice to day-to-day operation, in the home and social context.

As for dyscalculia, training and socio-behavioural strategies can be fine-tuned for experts and parents in the treatment and integration processes. These are strategies that both parents and professionals have to know, apply and monitor. These strategies can include:

- work towards visualizing the mathematical problem, even if it is necessary to draw diagrams or charts;
- provide sufficient time for observation of illustrated materials, such as diagrams, charts, etc.;
- develop listening skills and perception skills for mathematical information;
- require examples to illustrate rules or formulas;
- require examples with real-life situations involving the mathematical problem under study;
- present an algorithm or rule in a diagram or table;

- require smoother work and provision of a lot of visual information for support;
- allocate enough time to memorize mathematical facts;
- use the rhythm of musical or rhymed texts to reinforce retention;
- set higher academic requirements;
- in case of problems of different types, do not strictly adhere to the syllabus, but make the therapeutic models comply mainly with students' capacity and achievements. Mathematical concepts and operations are hierarchical and in this regard, require initial knowledge of the facts, understanding of the rule, and then acquisition of the operation under study;
- use individual and group work instructions;
- introduce a network of instructional goals in mathematics;
- encourage students to voice their understanding of a certain mathematical definition, notion, or rule;
- give feedback through practical activities;
- give enhanced specific instructions for each mathematical problem. For example, the problem 4 + 2 = … should be stated, "Add two plus two and write down the result". Each task should follow the same instructional model;
- follow a two-stage model: ad exemplum and ad exemplum with a verbal description of the steps in the algorithm;
- if necessary, use key words to focus the attention (e.g. listen, see, look);
- keep track of students' progress (in terms of both their strong points, and weak points), instead of emphasizing only the failed models and poor knowledge; the error correction scheme should also involve the good, and, if any, the exceptional achievements in the field of abstract and applied mathematical knowledge and skills;
- when possible, offer students a choice of materials, types of mathematical problems, etc.;
- provoke students' fantasy and imagination;
- create conditions for behaviour related with taking decisions;
- encourage students to ask questions and ask for help;
- use materials for self-assessment and assessment of students' knowledge and skills;
- identify the history of the problem in terms of type and aetiology;
- in case of several problems of the same type, correct in sequence;

Within the teamwork for subduing or overcoming the dyscalculia, it is of a crucial importance that the family of the person with dyscalculia be actively

and continually involved in the therapeutic and integrative processes. In this context, specific recommendations for the family members can be put forward:

- it is important to show consideration and establish trust with regard to the emotions and feelings of a person with dyscalculia, as well as to his or her responses. Speak about the disability with people in whose company you feel well. There should not be an impression that you are concealing something or you feel embarrassed.
- raise your awareness of your emotions and try to make sure that they do not affect your judgment of the needs of the person with dyscalculia.
- encourage the development of skills in areas in which there are no disabilities (e.g. sport, artistic and creative activities).
- arrange the space layout in such a way that it facilitates the learning or household activities at home. Observe a certain routine (time slots for study, play, etc.)
- find the balance between supporting the person with dyscalculia and coping with the disability on the one hand, and with overprotecting, on the other hand, as the latter can create a dependency and oversized needs.
- during the treatment, the person with dyscalculia becomes more competent in some skill. If, prior to the treatment, a model of strong dependency existed, then there may be anxiety that there will not be the same affection and trust as there would be if there was no disability.
- identify behaviour of the "smoke-screen" type, which provokes or exaggerates in order to "shirk" mathematical problems which the person with dyscalculia believes that he or she cannot solve.
- do not apply lowered demands in all areas. Require more in areas in which there is no disability.
- be patient. If you are anxious, upset, or impatient, this will reinforce the feeling of insecurity and will worsen the symptoms.
- give the child the opportunity to discover things on his/her own. Encourage his or her responsibility and independence. Leave him or her to set the pace and lead, not just to take on a passive role.
- facilitate a relaxing environment. It is possible that when the person with dyscalculia comes back from school, he or she is exhausted. The frustration that he or she was unable to express at school or in a working environment sometimes suddenly explodes as soon as he or she steps in.

- seek activities and social network that are not intimidating to him or her and do not require good performance in the fields in which the person with dyscalculia feels insecure.
- Be aware that the child with dyscalculia, like all other children, changes as he or she grows up. At certain age stages, there are some break-even points when the child changes too fast. Do not insist on the child's doing something that used to delight him or her in the past, when it is clear that he or she is undergoing a process of change. Help yourself, as you:
  - Let your anxiety go (barriers);
  - Eliminate the bewilderment – mental, emotional and physical. Try to maintain an arranged environment at all levels; help the child do the same.
  - Establish a feeling of security. If the child feels secure about something, he or she can relax;
  - Facilitate imagery thinking. Should the circumstances change, /i.e. the clear pictures in the child's conscience about what he or she is being told and he or she expects to happen /, there is a discrepancy between his or her mental picture and reality.
  - Be a security paradise. Children with disabilities need unconditional love and acceptance by the parents and the family;
  - Do not allow the school to invade your home. Parents are often convinced that they have to present before their child the same viewpoint as the school, so that the expectations and requirements at home and school are consistent. For the mainstream kids there is no problem at all, but for children with disabilities, such a situation would worsen the problems. Each requirement should be presented in the context of unconditional acceptance and love.

The disabilities in the learning ability, although in a special type of manifestation, are not situative or short-lived. They, however, are favourably influenced by special training and impact, both by experts – professionals in the area of special education, and by the parents and the family. With people with dyscalculia, the professional – family interactions are neither just meetings and talks, nor consulting - they are teamwork. As such, they need to be related not only with willingness, but also with taking certain responsibilities.

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