

TOWARDS AN ECLECTIC APPROACH IN AUTISM SPECTRUM DISORDER (ASD)-SMARTS (SEQUENTIAL MULTIPLE ASSIGNMENT RANDOMIZED TRIALS-SMARTS)

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Abstract

The need for evidence-based therapy is a reality in contemporary therapeutic approaches. The most studied approach in autism spectrum disorder (ASD) is the ABA therapy (Applied Behavioral Analysis), among other 27 validated programs Hume & al. (2021) and Steinbrenner & al. (2020). Even if ABA is well known and strongly scientifically studied, in almost 30% of the cases it does not lead to developing the desired verbal communication abilities ((National Institute on Deafness and Other Communication Disorders, 2010; Kasari, Sturm, Shih, 2018). In this context, speech and language therapy can be an alternative to this approach, its use being combined with the usage of different other psychological and psycho-pedagogical techniques and programs for enhancing children and families with the target abilities. This mixture of therapies, known as eclectic approach is often compared with ABA approach and criticized due to its lack of scientific proof. In order to ensure the evidence based approach we propose the implementation of SMARTs (Sequential Multiple Assignment Randomized Trials-SMARTs). The SMARTs approach offers the possibility both to collect measurable data based on the established goals and to tailor possible intervention programs adjusting the approach to participants' needs. In our research the SMARTs structure include: a sequence of decisions (it applies if participants do not respond positively to the intervention and it is used at each three months' reevaluation stage), a set of intervention decisions (in this research SLT is combined with kineto-therapy, oral-motor myofunctional therapy, psych-pedagogical programs and programs for sensory integration), elements/factors that indicate change in the established approach (it refers to factors that prove that the intervention program needs to be changed, in our research these are: regression and a plateau in speech and language development acquisition longer than one month) and a sequence of decision rules able to link the other sequences (these decision rules are based on the evaluation and reevaluation results and on reaching or not the established goals in speech and language development area). Participants in the research are 9 children with severe ASD (N=9), with ages between 6-9 years' old. The starting point of our SMARTs approach implementation was a comprehensive general assessment of speech and language development based on ISD (Integrated Scale of Development), MLU (Mean Length of Utterance) and SIR (Scale for Intelligibility Rate). The intervention period was January 2021-december 2021. Results demonstrated relevant gains in speech and language development of 6-9 months (based on ISD) and of 3 points based on SIR (from 2 level-just of words intelligible, till 5 level-all words intelligible). Very poor results were obtained at the MLU level, due to the fact that grammar approach is difficult to implement. In conclusion we can underline the fact that SMARTs can be a reliable way in individualizing and in collecting scientific proof about speech and language development in ASD context, based on eclectic intervention programs. Further research will be developed in order to tailor the morphological and syntactical aspect in speech and language development.

Keywords: Eclectic approach, speech and language therapy (SLT), autism spectrum disorder, SMARTs (sequential multiple assignment randomized trials-SMARTs), evidence based therapy.

1. Introduction

Autism Spectrum disorder (ASD) is a neurodevelopmental disorder diagnosed based on the following criteria according the 5th edition of the Diagnostic and Statistical Manual of Mental Disorders, or DSM-V elaborated by American Psychiatric Association and worldwide used:

- **A. Persistent deficits in social communication and social interaction across multiple contexts** (based on this diagnosis criterion ASD signs are: the child is not interested to be with other children, is most of the time alone, and he likes to be isolated; the child is inattentive or has no interest in others; he does not focus on the others, has no joint attention; has difficulty in sharing and in getting involved in social activities; he is not able to interpret one's wishes, feelings or communication intentions; has difficulty in following a conversation; in having friends; has significant communication disorders).
- **B. Restricted, repetitive patterns of behavior, interests, or activities** (based on this criterion ASD signs are: communication is characterized by stereotypes, echolalia is present; the child with ASD is not able to adapt to different and new environments; he has stereotyped or repetitive motor movements, he often dislikes physical contact; has lots of sensorial difficulties in adapting and he is quickly upset by visual or aural stimulation that is too intense or too numerous: too much noise, too many movements can rapidly bring on unappropriated behaviors; shows anxiety and disruptive behaviors when changes in routine, unexpected events or the non-respect of rules appear; cannot handle transitions in terms of space or time; often has specific repetitive interests that can become obsessive).
- **C. Symptoms must be present in the early developmental period (but may not become fully manifest until social demands exceed limited capacities or may be masked by learned strategies in later life).**
- **D. Symptoms cause clinically significant impairment in social, occupational, or other important areas of current functioning.**
- **E. These disturbances are not better explained by intellectual disability (intellectual developmental disorder) or global developmental delay.**

ASD diagnostic criteria underline the fact that communication disorders are an important aspect to be followed within this pathological context (Mattila, Kielinen, Linna, Jussila, Ebeling, Bloigu, Joseph, & Moilanen, 2011). Unfortunately, many researches are centered in proving the impact behavioral based therapies have and less evidence-based practices are to be found in relation with the speech and language therapy in ASD context.

The most studied approach in autism spectrum disorder (ASD) is the ABA therapy (Applied Behavioral Analysis), among other 27 validated programs based on Hume & al. (2021) and Steinbrenner & al. (2020) research. Even if ABA is well known and strongly scientifically studied, in almost 30% of the cases it does not lead to developing the desired verbal communication abilities ((National Institute on Deafness and Other Communication Disorders, 2010; Kasari, Sturm, Shih, 2018).

In this context the need to implement speech and language therapy programs in ASD is of extreme relevance. ASHA (2022) states the following areas a SLT covers in working with ASD in order to reach the final objectives, to improve communication and social interaction skills:

- using appropriate communication behaviors in different social contexts;
- developing pragmatic communication skills (to start, continue, end a conversation; to establish; communication-based relations with people);
- improving speech sounds production in relation with accepting different types of food textures and expanding eating abilities as well as strengthening voice production;
- improving reading and writing skills.

2. Objectives and research methodology

Based on the following data our research was developed based on the following **objective**: to implement SMARTs trials in approach to the SLT services we deliver for children with speech and communication disorders secondary to ASD.

We started from the assumption that SMARTs can be a useful method in order to offer evidence-based data for organizing the SLT sessions in the ASD context.

The SMARTs approach offers the possibility both to collect measurable data based on the established goals and to tailor possible intervention programs adjusting the approach to participants' needs. SMARTs approach is considered a very adequate possibility to conduct an experimental approach in order to build adaptive intervention programs in such a fluid area as SLT in ASD context (Ghosh, Nahum-Shani, Spring, & Chakraborty, 2020; Lavori, & Dawson, 2004; Murphy, 2005; Nahum-Shani, Ertefaie, Lu, Lynch, McKay, Oslin, & Almirall, 2017; Pfammatter et al. 2019).

In our research the SMARTs structure include:

- a sequence of decisions (it applies if participants do not respond positively to the intervention and it is used at each three months' reevaluation stage),

- a set of intervention decisions (in this research SLT is combined with kineto-therapy, oral-motor myofunctional therapy, psych-pedagogical programs and programs for sensory integration),
- elements/factors that indicate change in the established approach (it refers to factors that prove that the intervention program needs to be changed, in our research these are: regression and a plateau in speech and language development acquisition longer than one month),
- a sequence of decision rules able to link the other sequences (these decision rules are based on the evaluation and reevaluation results and on reaching or not the established goals in speech and language development area).

3. Participants and instruments in the research

Participants in the research are 9 children with severe ASD (N=9), with ages between 6-9 years' old. They were assessed at the beginning of the experimental period in January 2021 with the following tools:

- MLU (Mean Length of Utterance) - this assessment was conducted based on an interest topic for communication for every child and the SLT tried to collect as many autonomous speech productions (examples of conversation topics: animals, food, visits etc.) (Hațegan, 2010),
- SIR (Speech Intelligibility Rating Scale) - the SLT appreciated children's speech intelligibility level based during the first assessment session, this scale appreciates speech intelligibility on a Likert scale from 1-5 points, 1 meaning unintelligible spoken production and 5 meaning intelligible in all context spoken production, even for people unfamiliar with child's speech,
- ISD (integrated Scales for Development) - ISD supports the monitoring and tracking of the child's development from birth to 48 months in the areas of; Listening, Receptive Language, Expressive Language, Speech, Cognition and Pragmatics. From the six developmental areas two areas were being assessed in this research: receptive and expressive language (Anca; Bodea Hațegan, 2012).
- a short qualitative description of speech and language production is being made, with focus on the vocabulary level and on the ability to use just words or also utterances and sentences while speaking and communicating.

Table 1. Initial assessment results.

Diagnosis	Age	MLU	A short qualitative description of their speech and communication abilities	SIR	ISD receptive language	ISD expressive language
M.A.	6 years old	1	has less than 30 words produced just by imitation	3	30 months	18 months
E. G.	8 years old	2.4	is able to express two words sentences	2	48 months	30 months
E.C.	6 years old	1.8	is able to produce independently approximately 50 words, sentence is emergent	2	37 months	24 months
M.P.	8 years old	1.5	he is able to produce around 30 words independently, he has just 2-3 contexts in which he is able to produce a two words utterance	3	24 months	18 months
D.B.	7 years old	2	he has 50 independent words but has no longer utterances than two words combinations	2	40 months	24 months
A.P.	6.5 years old	2	she started to combine words in small sentences, has more than 50 independent words	3	34 months	27 months
E.P.	7 years old	1.5	she is able to reproduce words by imitation and has few two words utterances	3	30 months	24 months
I.P.	8 years old	1	he is able to imitate just a few words, less than 30 words	2	28 months	18 months
P.A.	8 years old	3.4	he is able to speak in sentences but without using the grammatical connectors, has more than 250 independent words	4	48 months	37 months

The experimental trials were adjusted at a three months' period of time, based on the results children obtained. The SLT intervention program we implemented in these 12 months of experimental therapy was organized on the following areas:

1. Basic concepts (with focus on respiration ab phonological awareness)
2. T⁵⁰ Technique (this is a new technique elaborated by Bodea Hațegan, 2016, focused on developing articulation strategies based on imitation. Therapists articulate words and children repeat them. This technique is applied daily even with parents' help. The list of words is changed weekly based on the semantic development of the children.)
3. Orofacial myofunctional mobilization (orofacial massage, Castillo Morales massage and Z- Vibe tools were used)
4. Program for voice training
5. Program for building the utterance (two words combination)
6. Program for building the sentence
7. Program for developing communication skills

Final results demonstrated relevant gains in speech and language development of 6-9 months (based on ISD) and of 3 points based on SIR (from 2 level-just of words intelligible, till 5 level-all words intelligible). Very poor results were obtained at the MLU level, due to the fact that the grammar approach is difficult to implement.

Table 2. Final assessment results.

Diagnosis	Age	MLU	A short qualitative description of their speech and communication abilities	SIR	ISD receptive language	ISD expressive language
M.A.	7 years old	2	has more than 50 independent words, uses two words utterances, can imitate even long and unfamiliar words	4	38 months	24 months
E. G.	9 years old	3.4	is able to express two words sentences on a regular basis and stereotypic sentences are also present	5	48 months (his understanding abilities improved a lot but this scale does not cunt them more than 48 months level)	48 months
E.C.	7 years old	3	is able to produce independently approximately 100 words, sentence is easily used	3	42 months	30 months
M.P.	9 years old	2	he is able to produce around 50 words independently, he is able to produce stereotypic two words utterance	3	30 months	24 months
D.B.	8 years old	3	he has around 100 independent words, uses independently two words utterances on a regular basis, long sentences are emergent (with three and more than three words)	3	48 months	30 months
A.P.	7.5 years old	3	she uses independently sentences with more than three words combinations, has more than 100 independent words	3.4	42 months	37 months
E.P.	8 years old	2.5	she is able to reproduce words by imitation and has two words utterances independently used	3	40 months	27 months
I.P.	9 years old	1	he is able to imitate just a few words, less than 50 words, two words utterances are used just in 5 contexts	2	30 months	24 months
P.A.	9 years old	3.4	he is able to speak in sentence using some grammatical connectors on a regular basis, has is also able to sustain a small conversation	5	48 months (his understanding abilities improved a lot but this scale does not cunt them more than 48 months level)	48 months

4. Conclusions

Speech therapy in the context of ASD and in all the context must follow evidence-based practice. The SLT's decisions based on SMARTs approach, during intervention phase had a positive impact on the children's progress recorded in this study.

In conclusion we can underline the fact that SMARTs can be a reliable way in individualizing and in collecting scientific proof about speech and language development in ASD context, based on eclectic intervention programs. Further research will be developed in order to tailor the morphological and syntactical aspect in speech and language development.

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