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# **Development and implementation of a framework for the evaluation of early intervention programs for children with autism spectrum disorder**

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## **Resumo**

A perturbação do espectro do autismo (PEA) é uma perturbação do neurodesenvolvimento, que envolve défices na comunicação e interação social recíproca assim como nos padrões atípicos de comportamento e interesses restritos.

Um estudo realizado em 2005, revelou que em Portugal, a prevalência desta perturbação é de aproximadamente 0,92% no continente e 1,56% nos Açores. A literatura demonstra a importância da intervenção precoce para o desenvolvimento das crianças com PEA. Por este motivo, é importante a avaliação empírica do processo e resultados dos programas de intervenção precoce para estas crianças. O objetivo deste estudo foi desenvolver e implementar um método compreensivo para a avaliação de programas de intervenção precoce para crianças com PEA. Este método inclui a descrição de um programa de intervenção precoce, os modelos teóricos em que este se baseia, os seus objetivos, estratégias e a sua duração e intensidade. Avaliaram-se os efeitos do programa no desenvolvimento e severidade dos sintomas das crianças, através da utilização do PEP-3 em dois momentos diferentes: pré e pós-intervenção. Avaliou-se também a perceção dos pais quanto à viabilidade e aceitabilidade do programa, como também em que medida se sentiram envolvidos na intervenção. A perceção dos pais sobre a qualidade dos serviços foi também avaliada. Finalmente, avaliou-se a satisfação dos profissionais relativamente ao trabalho em equipa e a sua perceção de autoeficácia.

Os resultados sugerem efeitos positivos do programa no nível de desenvolvimento das crianças. Contudo o programa revelou-se menos eficaz na produção de mudanças significativas na sintomatologia. A satisfação global dos pais foi elevada. A satisfação global dos profissionais foi também muito positiva.

*Palavras-chave:* perturbações do espectro do autismo; intervenção precoce; avaliação de programas de intervenção precoce; equipa transdisciplinar; satisfação dos pais; satisfação dos profissionais; autoeficácia dos profissionais

## **Abstract**

Autism Spectrum Disorder (ASD) is a neuro-developmental disorder that involves difficulties in social communication and interaction as well as unusual patterns of behavior and interest.

A study made in 2005, reported that in Portugal, the prevalence is approximately 0.92% in the continent and 1,56% in Azores. The literature underlines the importance of early intervention for the development of children with ASD. Therefore, it is important to empirically evaluate the process and the results of early intervention programs for these children. The objective of this study was to develop and implement a comprehensive method to evaluate early intervention programs for children with ASD. It was described an early intervention program, including the theoretical model on which the program was based, the objectives, strategies, length and intensity of the program. The program effect's on children development and autistic symptom severity, were evaluated using the PEP-3 in two different moments: pre and post-test. Parent's perceived feasibility and acceptability of the program were also evaluated, as well as if they felt involved in the intervention. Parent's perception of the quality of the services provided was also evaluated. Finally, the professional's satisfaction about the team work and their perception of self-efficiency.

The results suggests the program had a positive effect in children development. However, most children did not show significant progress in the autistic symptom severity between pre and post-test. Parent's global satisfaction was high. Professional's global satisfaction was also very positive.

*Keywords:* autism spectrum disorder; early intervention; evaluation of early intervention programs; transdisciplinary team; parent's satisfaction; professional's satisfaction; professional's self-efficiency

## **Resumé**

Le trouble du spectre de l'autisme (TSA) est un trouble neurodéveloppemental qui comprend des déficits dans la communication et interaction sociale bien comme des comportements et intérêts restreints.

Au Portugal, la prévalence c'est environ 0,92% au continent et 1,56% à Açores.

La littérature nous montre l'importance de l'intervention précoce dans le développement des enfants avec TSA. Il est donc important l'évaluation empirique du processus et les résultats des programmes d'intervention précoce pour ces enfants. Cette étude avait pour objet donner et mettre en œuvre une méthode compréhensive pour l'évaluation des programmes d'intervention précoce pour des enfants avec TSA. Il a été décrit un programme d'intervention, y compris les modèles théoriques sur lesquelles celui-ci se fonde, ses objectifs, stratégies et sa durée et intensité. Ils ont été évalués les effets du programme dans le développement et sévérité des symptômes des enfants, à l'aide du PEP-3 à deux moments différents: avant l'intervention et après l'intervention (qui ne correspondent pas au début et à la fin de l'intervention). Il a été aussi évalué l'applicabilité et l'acceptabilité du programme perçues par les parents et s'ils se sont sentis impliqués dans l'intervention. La perception de la qualité par leurs parents a aussi été évaluée. Finalement, il a été évaluée la satisfaction des professionnels du programme par rapport au travail en équipe et sa perception d'auto-efficacité.

Les résultats indiquent des effets positifs du programme dans le développement des enfants. Cependant, la plupart des enfants n'a pas révélé des progrès par rapport aux symptômes de l'autisme pré-test et post-test. La satisfaction globale des parents a été élevée ayant environ 4,05 (DS 0,45). La satisfaction globale des professionnels a aussi été très positive ayant environ 4,56 (DS 0,50).

*Mots- clés:* trouble du spectre de l'autisme; intervention précoce; évaluation des programmes d'intervention précoce; équipe transdisciplinaire; satisfaction des parents; satisfaction des professionnels; auto-efficacité des professionnels

## Index

|                                                                                                   |    |
|---------------------------------------------------------------------------------------------------|----|
| <b>Introduction</b> .....                                                                         | 1  |
| <b>I. Definition of autism spectrum disorder</b> .....                                            | 1  |
| <b>II. Characteristics of autism spectrum disorder</b> .....                                      | 1  |
| i. Essential Characteristics.....                                                                 | 1  |
| ii. Other Characteristics.....                                                                    | 1  |
| <b>III. Early Identification and early intervention</b> .....                                     | 3  |
| <b>IV. Early intervention outcomes</b> .....                                                      | 6  |
| <b>V. Instruments for to diagnose and to evaluate children with autism spectrum disorder</b><br>7 |    |
| <b>VI. Evaluating early intervention programs</b> .....                                           | 8  |
| <b>VII. The present study</b> .....                                                               | 11 |
| <b>Method</b> .....                                                                               | 13 |
| <b>I. IPIP program</b> .....                                                                      | 13 |
| i. Program Objectives.....                                                                        | 13 |
| ii. The conceptual models underlying the Program.....                                             | 14 |
| iii. Theory of Mind, Executive Function Theory and Central Coherence Theory                       | 17 |
| iv. The IPI.....                                                                                  | 18 |
| v. Components of the program.....                                                                 | 19 |
| vii. The individual plan for each child .....                                                     | 19 |
| <b>II. Participants</b> .....                                                                     | 20 |
| <b>III. Measures</b> .....                                                                        | 20 |
| <b>Results</b> .....                                                                              | 23 |
| <b>I. Program effects on children: Pre and post-test comparison</b> .....                         | 23 |
| i. Analysis of the children’s adaptive level .....                                                | 23 |
| ii. Analysis of the children’s developmental age .....                                            | 26 |
| <b>I. Parent’s evaluation of the program</b> .....                                                | 29 |
| <b>II. Professional’s evaluation of the program</b> .....                                         | 31 |
| <b>Discussion</b> .....                                                                           | 35 |
| <b>Conclusion</b> .....                                                                           | 42 |
| <b>References</b> .....                                                                           | 45 |
| <b>Appendixes</b> .....                                                                           | 50 |

## **Introduction**

### **I. Definition of autism spectrum disorder**

Autism Spectrum Disorder is a neuro-developmental disorder which involves difficulties in social communication and interaction as well as unusual patterns of behavior and interest (Jagan & Sathiyaseelan, 2016). In Portugal, the prevalence is approximately 0.92% in the continent and 1,56% in Azores (Oliveira, 2005).

### **II. Characteristics of autism spectrum disorder**

#### **i. Essential Characteristics**

The essential characteristics of Autism Spectrum Disorder are: persistent impairment in reciprocal social communication and social interaction (criterion A), and restricted, repetitive patterns of behavior, interests or activities (criterion B). These symptoms are present from early childhood and limit or impair everyday functioning (criterion C and D). The stage at which functional impairment becomes obvious will vary according to characteristics of the individual and his or her environment. Manifestations of the disorder will also vary greatly depending on the severity of the autistic condition, developmental level, and chronological age; hence, the term spectrum. Autism Spectrum Disorder encompasses disorders previously referred to as early infantile autism, childhood autism, Kanner's autism, high-functioning autism, atypical autism, pervasive developmental disorder not otherwise specified, childhood disintegrative disorder, and Asperger's disorder (APA, 2013).

#### **ii. Other Characteristics**

Volkmar, Rogers, Paul & Pelphrey (2014), in *The Handbook of Autism and Pervasive Developmental Disorders*, present a number of characteristics of children with autism spectrum disorder, such as deficits in eye gaze. Nevertheless, research shows that gaze behavior does not predict severity and frequency of autism symptoms (Young, Merin, Rogers & Ozonoff, 2009). The literature also indicates that children with autism spectrum disorder present impairment in face processing, because of their limited attentional bias for these socially relevant stimuli, their atypical scanning patterns and deficits in recognition. (Chawarska, Volkmar & Klin, 2010).

Another characteristic is the difficulty in joint attention, which is the ability to use and follow eye contact, pointing or other gestures in shared experiences. The literature states a significant association between children joint attention skills and the development

of social competence. Moreover, a study has shown that infants with a typically development who can use joint attention, receive more positive social and behavioral reports from parents (Vaughan Van Hecke et al., 2007).

One of the most reported early signs of autism spectrum disorder in children is language impairment (Howlin, 2003), with echolalia being one of the most common aspect of deviant speech in autism (Volkmar, Rogers, Paul & Pelphrey, 2014).

Imitation skills can also be affected. Smith and Bryson (1994), in their critical review, mention a range of studies which report that autistic children may present deficits across different types of imitation.

Social play in children with autism spectrum disorder is very rare. They spend more time playing alone or in parallel play with other children, than social play (Holmes & Willoughby, 2005). A recent study, where children with autism spectrum disorder were observed in their classrooms, showed they spend most of the time in an unengaged state. These children didn't attend or interact with objects nor other people and showed a great difficulty in initiating engagement with others. This study also showed that children who spent more time unengaged were less likely to display play and joint attention skills (Wong & Kasari, 2012). Compared to typical infants, children with autism spectrum disorder show less frequency and duration of integrated sequences of functional acts. They also produce more simple functional acts compared to typical children and spend more time producing them, than elaborated acts (Williams, Reddy & Costal, 2001). When compared to children with other disabilities, they initiate functional play fewer times in unstructured activities, but display more functional play in structured activities (Wong & Kasari, 2012).

Children with autism spectrum disorder are more competent in functional play, than in symbolic play (Volkmar et al., 2014). Concerning the symbolic play, when compared to typical infants, children with autism spectrum disorder produce less symbolic play acts involving attributions of false properties and do not produce symbolic acts that involve a reference to an absent object (Libby, Powell, Messer & Jordan, 1998).

Individuals and children with autism spectrum disorder may also present attention deficits (Volkmar et al., 2014). However, the literature reports that, when compared to individuals with typical development, attention performance for simple repetitive visual information tasks is generally intact in individuals with autism (Buchsbaum et al., 1992).

Considering memory, individuals and children with autism spectrum disorder may show an extraordinary memory for certain knowledge domains, which allows them to accumulate a lot of information about a particular topic. However, they show great difficulty to remember aspects of their daily life, not being able to share their experience with others. They also demonstrate difficulty in navigating their daily environment, because they cannot remember certain details such as their schedule of classes and activities of morning routine (Volkmar et al., 2014).

The literature also shows that autistic individuals and children present deficits in executive function, such as planning, mental flexibility, inhibition, generativity and self-monitoring (Hill, 2004). Regarding the level of cognitive function, individuals and children with autism spectrum disorder span the entire range, from profound mental retardation to superior intellect (Volkmar et al., 2014). ASD children also may present difficulties in the theory of mind, which is the ability to imagine other people thoughts and feelings (Baron-Cohen, Leslie & Friths, 1985).

It is also known that children with autism spectrum disorder may present motor difficulties, such as deficits in postural control (Travers, Powell, Klinger & Klinger, 2013), deficits in gait (Nayate et al., 2012) and in more specific skills like handwriting (Hellinckx, Roeyers, & Van Waelvelde, 2013). Finally, literature also states that children with autism spectrum disorder may present sensory processing difficulties (Kientz & Dunn, 1997).

### **III. Early Identification and early intervention**

Prospective studies of children at risk of autism spectrum disorder, generally younger siblings of children diagnosed with autism spectrum disorder, indicate that the diagnostic symptoms presented in the DSM- 5 (APA, 2013) are usually expressed by 12-18 months in most children. However, some symptoms such as motor and sensory impairments occur earlier, in the first 12 months (Sacrey, Bennett, & Zwaigenbaum, 2015).

Autism is a spectrum, therefore every child with autism may not show all the symptoms and these symptoms may vary in severity. Parents sometimes cannot recognize early symptoms. In fact, the behavior of children younger than two years old may not certify for a diagnosis and it is very difficult to evaluate their verbal communication. Social interactions are built from the family environment and develop as the child moves

into unfamiliar social environments. Consequently, it may be difficult to notice impairments in social interactions before children are exposed to a different social setup (Jagan & Sathiyaseelan, 2016).

As Chakrabarti (2009) referred there is a delay of 32 months between parents first recognition of a problem in their child development and the formal diagnose of autism. Taking this information into account, it is not surprising that some children begin the intervention very late. However, the literature also states that early diagnosis can be done and can be stable. A study conducted by Eaves and Ho (2004) evaluated forty-nine children, potentially with autism spectrum disorder, at the age of two and a half years and again at four years and a half. At the first moment (two and a half years) thirty-four children were diagnosed with autism, nine had pervasive developmental disorder, not otherwise specified, and six did not have the diagnose of autism spectrum disorder. At the second moment (four years and a half), thirty-six children were diagnosed with autism, four with pervasive developmental disorder and nine with none autistic disorder. This study confirmed that early diagnosis was stable, since seventy-nine per cent of participants maintained the same diagnose and only ten per cent changed the diagnose. Only one child moved out of the spectrum.

The term early intervention refers to a specific intervention designed to improve a young child's development. Early intervention should begin with a comprehensive assessment of the family and child's needs and strengths, so the proper services and support can be provided. It should also involve a close monitoring and reevaluations as the child develops. Early intervention programs can be implemented with children at risk of poor development outcomes (usually conceptualized as preventive interventions) or for children with identified development delays or disabilities (generally conceptualized as treatment programs) (Ramey & Ramey, 1998).

When a child with a disability is involved in an early intervention program, an individualized plan for the child and the family that considers their specific needs must be developed. This plan describes the intervention components and the expected developmental progress or outcomes. This plan is developed collaboratively by the family and professionals and should be updated at least annually. When a child at-risk for a disability is participating in an early intervention program, success is usually defined in terms of a more positive intellectual and social-emotional development relatively to the expected development if the child was not participating in the program. In order to

understand the success or even the failure of early intervention, this comparative framework is very important. (Ramey & Ramey, 1998).

The literature indicates that early intervention programs for children at risk for developmental delay, mental retardation, poor school achievement or all of these, may produce modest to large effects on children's social and cognitive development. It is important to note that early intervention programs that begin in an early stage of development and continue to follow the child for a long time produce better outcomes than those that begin later and follow the child for a short period of time. More intense programs, with more hours of intervention per day and per week in different contexts, also produce more positive effects than the less intensive ones. Additionally, children and their parents tend to show a better developmental progress if they participate regularly and actively in the program. Furthermore, programs which provide direct educational experiences to the child produce better outcomes than those which only rely on intermediary routes, like parent training. Also, a program will produce larger effects if it provides more comprehensive services and uses multiple routes to improve children development (Ramey & Ramey, 1998).

Despite these general guidelines, it is important to have in mind that every child is unique, and so some will benefit more from participating in early intervention than others. Besides, none of the more influential development theories contends that early positive experiences are enough to ensure that the children will perform well throughout their lives. This also means that early effective positive experiences are not enough. Children must continue to develop in multiple domains so that they can succeed in school. Over time, the positive effects of early intervention will disappear if there is no continued adequate environmental support to help the children and to encourage them to continue learning in school. Some contextual conditions negatively influence the children and adult's behavior in all ages, such as poor school environments, dysfunctional home environment, economic depression and poor health. Taking this into account, when early intervention programs inquire about long-term effects, it is important to consider the children's environments and experiences, not only during but after early intervention (Ramey & Ramey, 1998).

Over the years, a variety of early intervention programs has been evolving from different models such as behavioral interventions, developmental interventions and cognitive-behavioral interventions. Each program is based on a different model and has

its unique strategies (Corsello, 2005). However, more recent empirical evidence continues to show what Ramey and Ramey (1998) defended in their article, that there are two factors that are common to the diverse approaches: the more intense the program is, the better are the results and children who enter in the programs in early ages achieve the best results. The empirical evidence continues to show that children who enter the programs at younger ages achieve better results than those who initiate the program at older ages (Corsello, 2005). For example, a study conducted by Harris and Handleman (2000) showed the benefits of intensive early intervention for young children with autism. The results showed that for young children with autism: children who entered the program at a younger age were more likely to have an inclusive education placement than those children who began the program after that age.

Early intervention is also important to prevent the side effects caused by early deficits, which otherwise will more negatively interfere with later development, creating a series of problems, in the psychological and neurological development (Ozonoff, Rogers & Hendren, 2003, cited in Aguiar, 2009).

#### **IV. Early intervention outcomes**

In their systematic review on the feasibility and effectiveness of very early intervention programs of infants at-risk of autism spectrum disorder, Bradshaw, Steiner, Gengoux and Koegel (2015) presented the results for developmental outcomes, diagnostic outcomes and social-communication outcomes of several studies. Regarding the developmental outcomes, three studies showed within-group gains in cognitive abilities. One study observed gains in adaptive behavior and cognitive skills compared with the control group (the treatment-as-usual group). However, there was one study that did not show significant between-group differences regarding the developmental outcome. Concerning diagnostic outcome, some studies showed that the autism symptom severity of children older than twelve months appear to reduce with intervention, although these improvements were not significantly different from the control group (the treatment-as-usual group). For the social-communication outcome, the studies demonstrated improvements in positive affect, eye contact, response to name, infant liveliness, emerging communication, joint attention and expressive and receptive language.

A more recent study, conducted by Rollins, Campbell, Hoffman and Self (2016), showed similar results. They evaluated four boys with autism spectrum disorder, younger

than thirty-four months of age at the beginning of the study, who received intervention from a community-based early intervention program. They evaluated improvements in eye contact, social engagement and verbal reciprocity. The results showed the intervention was moderately to highly effective for three of the children for verbal reciprocity and social engagement. For the eye contact there were improvements for two children.

Therefore, in general literature suggests that early intervention programs have a positive effect on children with autism spectrum disorder. Regarding the social-communication outcomes, children show improvements in positive affect, eye contact, infant liveliness, expressive and receptive language and in behavior. Concerning the developmental outcomes, there are also gains in cognitive abilities and in adaptive behavior. However, whereas some studies show significant differences between the experimental and the treatment-as-usual groups (who also receive intervention, but different from the experimental groups), other studies did not find differences. Respecting the diagnostic outcome, the studies show a reduction of autism symptoms severity, although they may not be significantly different from the treatment-as-usual group.

#### **V. Instruments for to diagnose and to evaluate children with autism spectrum disorder**

There are a considerable number of instruments that can be used to diagnose children with autism spectrum disorder. In a systematic review of about the feasibility and effectiveness of very early intervention programs for children at risk for autism spectrum disorder, Bradshaw, Steiner, Gengoux and Koegel (2015) referred the instruments used by the early intervention programs they evaluated: the Autism Observation Schedule – Toddler Module (ADOS-T); the Autism Diagnostic Interview (ADI-R) and the Toddler Autism Diagnostic Interview; the Childhood Autism Rating Scale (CARS); the Infant Social Communication Questionnaire (ISCQ); the Modified Checklist for Autism in Toddlers (MCHAT); the Pervasive Developmental Disorders Screening Test-II; The Systematic Observation of Red Flags of ASD (SORF) and the Screening Tool for Autism in Two-Years Olds (STAT).

Although there are a large number of instruments to diagnose ASD in children, to our knowledge, only the Psychoeducational Profile: TEACH Individualized Psychoeducational Assessment for Children with Autism Spectrum Disorders- Third Edition (PEP-3) allows the creation of a psychoeducational profile of children with ASD,

by evaluating their development and maladaptative behavior in different areas. Therefore, the PEP-3 is very used to evaluate the development and maladaptative behavior of children with ASD.

## **VI. Evaluating early intervention programs**

Bradshaw, Steiner, Gengoux and Koegel (2015), in their systematic review, evaluated five components concerning the intervention approach and five components regarding the intervention outcomes. Concerning the intervention approach, they evaluated: the theories on which the program was designed; the clear statement of intervention goals and strategies that are based in the empirical and theoretical concepts of the program; the parent involvement and the length and intensity of the program, which are components well documented in literature to be important on early intervention. They also evaluated the experimental design, indicating that most studies measured the effects of the intervention by conducting a pre and post-treatment behavioral assessment. The five components regarding the intervention outcomes they evaluated were: parent-perceived feasibility and acceptability; the developmental outcome; the diagnostic outcome; the social- communication outcome. Some studies also evaluated moderators of outcome (such as the existence of previous intervention before the child enter an early intervention program; if the child has low interest in the objects used in the intervention, etc.), which can influence the effects of early intervention. These moderators can be difficult to evaluate, so there are not many studies that evaluated this component. By evaluating these five components regarding the intervention outcomes, it is possible to understand the effects of the intervention, therefore, it is important to have them in mind in an evaluation of an early intervention program.

Caron, Bérubé and Paquet (2017), published a systematic review where they evaluated the implementation of early intensive behavioral intervention programs for children with autism spectrum disorder. They considered important to analyze five components:

- 1) The participant's degree of exposure to the intervention offered. The authors underline that most studies do not offer information on the dosage actually administered to the children participating in the program, only the proposed dosage;
- 2) The adherence that refers to the extent to which the intervention complied with the proposed program;

3) The differentiation – the authors indicate that usually, the studies that compared two different programs, failed to evaluate how much the programs differed from one another and they also failed to indicate to which program component the results could be attributed;

4) The quality of the services provided, notably how well the caseworker masters the program, the characteristics related to the caseworker's know-how, and the relationship between the caseworker and the program recipient;

5) The participant's degree of engagement - their level of attention during tasks.

These systematic reviews complement each other regarding the components that should be evaluated in early intervention programs, since Bradshaw, Steiner, Gengoux and Koegel (2015) evaluated components concerning the intervention approach and the intervention outcome, while Caron, Bérubé and Paquet (2017) evaluated components regarding the implementation evaluation of the programs.

Having a child with autism spectrum disorder has an immense impact in a family, which is evident in both the severity and breadth of parent and family domains that appear to be affected. When compared with parents with typically developing children as well as children with other impairments such as hyperactivity and attention deficit disorder or intellectual disability, parents with a child with autism spectrum disorder often demonstrate decreased belief in their ability to look after their child effectively, increased parenting stress and higher levels of mental health concerns. Furthermore, families usually showed decreased family quality of life, along with an increase in marital and sibling relationship problems. This negative impact of having a child with autism spectrum disorder is likely to have a reciprocal negative effect on the child, creating a negative cycle that could mitigate the positive effects of intervention (Karst & Van Hecke, 2012).

Although research suggests that direct or indirect parent involvement in the intervention with children with autism spectrum disorder has several benefits, the evaluation of program effects is often limited to the assessment of the child and does not consider the impact of treatment on families, regardless of the extent of their involvement (Karst & Van Hecke, 2012). Therefore, Karts and Van Hecke (2012) proposed a model intended to be prescriptive in nature, to encourage the inclusion of parent and family assessment measures in the autism spectrum disorder intervention outcome research. This

model considers the direct impact of intervention in both the family and the child and considers how changes in one of these domains affect one another and the intervention process itself. The proposed model includes two primary domains:

- a) Parents and family outcomes - which should include the assessment of the family's functioning and well-being, the parent-child relationship, parenting efficacy and sense of competency, parenting stress, parent mental health (especially, anxiety and depression), and other issues appropriate for a particular intervention;
- b) Child outcomes - which should include evaluation of core and autism spectrum disorder symptoms, adaptive functioning, cognitive functioning and any treatment-specific goal or targets (e.g., behavioral problems, joint attention, social skills, repetitive behavior, etc.).

It is important to include the two domains in the evaluation of intervention programs for autism spectrum disorder, because if the changes in either sphere are omitted, the context in which children develop and autism spectrum disorder interventions are delivered, applied, and/or maintained is ignored. This model included some subcategories that appear to be important based on an extensive review of current autism spectrum disorder literature, which suggested that these domains can be impacted by having a child with autism spectrum disorder and improvement in these domains appears beneficial to the development and therapeutic success (Karst & Van Hecke, 2012).

Early intervention professionals working in a transdisciplinary team face many challenges. Although they are supposed to identify as an early intervention professional, they identify primarily with their own discipline. Another challenge they face is sharing strategies. Most professionals fear their strategies will be applied inappropriately if not presented by them and they lack confidence to apply strategies from other team member's specialties, when they do not have the required background knowledge to apply them. Taking these challenges into account, in a transdisciplinary team it is very important to have reflective practice sessions, to enable team members to reflect on their work, both as a team and individually and to provide them the opportunity to reflect on what it means in practice to work on a transdisciplinary team. Open and frank discussion and good leadership are crucial in a transdisciplinary team (Cumming & Wong, 2012).

Professionals can believe a certain course of action will produce certain outcomes, but such information won't influence their behavior if they have serious doubts about

whether they can or not perform the necessary activities to achieve those outcomes. Self-efficiency also influences how people cope with different situations. People tend to avoid situations they believe exceed their coping skills, whereas they tend to get involved in situations they believe they can handle. Therefore, when people have a strong self-efficiency, they put more efforts in their activities (Bandura, 1997). Outcome expectancy is a prerequisite of the development of self-efficiency. It is the individual belief that a particular behavior will produce a certain outcome (Jordan & Farley, 2008).

Taking all this information into account, the evaluation of an early intervention program should consider: the empirical and theoretical basis of the program; the program length and intensity; the intervention goals and strategies; the parent involvement; the developmental, diagnostic and social-communication outcomes in children; the participant's degree of exposure to the intervention offered; the adherence of the program; the quality of the services provided; the participant's degree of engagement; and when possible, an accurate differentiation between two different programs and the presence of moderators variables. Since the negative family impact of having a child with autism spectrum disorder can hinder the effects of early intervention programs, it is important to evaluate not only the child outcome, but also the family outcome. In addition, professionals face many challenges when they are working in a transdisciplinary team. Therefore, their satisfaction about the teamwork and the relationship between the team members and the supervision must be evaluated. Finally, it is known that low self-efficacy can have a negative impact in professionals' performance, which is why professional's self-efficiency should be evaluated.

## **VII. The present study**

The literature shows the importance of early intervention in autism spectrum disorder, therefore it is important to empirically evaluate the process and outcomes of early intervention programs for these children. As mentioned above, there are key components to consider, when evaluating this kind of early intervention programs. The objective of this study is to provide and implement a comprehensive method for the evaluation of early an intervention program for children with autism spectrum disorder. Specifically, it was described the intervention program, including the theoretical models on which the program was designed, the intervention goals, strategies and the length and intensity of the program. The program effects on children's development and symptom severity was evaluated, by using the Psychoeducational Profile: TEACH Individualized

Psychoeducational Assessment for Children with Autism Spectrum Disorders- Third Edition (PEP-3) in two different evaluation moments: pre and post-test (these moments did not correspond to the beginning and finalization of the program). There was also an attempt to evaluate the participant's degree of exposure. Parent's perceived feasibility and acceptability of the program and whether they feel involved in their child intervention are also evaluated. The parent's evaluation of the quality of the services provided will also be evaluated. As literature shows the struggles professionals face when working on a transdisciplinary team and how their self-efficiency may affect their work, in this study it will also be evaluated the professional's satisfaction about their team work and their self-efficacy.

## **Method**

### **I. IPIP program**

The IPIP<sup>1</sup> program (Intervenção Psicoeducacional Integrada Precoce) [Early Integrated Psychoeducational Intervention] is an early intervention program for pre-school aged children up until six years old, that present developmental disorders, such as autism spectrum disorder. The program is based on the IPI (Intervenção Psicoeducacional Integrada) [integrated psychoeducational intervention], which is a manualized intervention for children and adolescents with autism spectrum disorder and on the Early Start Denver Model (ESDM).

The IPI is based on the Developmental, Individual-differences and Relationship-based model (DIR) and the Greenspan Floortime approach, the Applied Behavior Analysis model (ABA) and the Treatment and Education of Autistic and Related Communication Handicapped Children model (TEACCH), which is the central model of this approach. It also integrates information from three psychological theories: Theory of Mind, Executive Function Theory and Central Coherence Theory.

#### **i. Program Objectives**

This IPI program has five general objectives:

- Provide a specialized, systematic and intensive intervention, as early as possible;
- Implement an intervention centered not only on the child, but also on the family, so that the professionals can offer strategies to family members to promote their self-efficiency and help them to take the lead in the developmental and educational process of the child, which promote a better quality of life for both the child and the family members;
- Prevent the side effects caused by early deficits, which interfere with the later development, creating a series of problems, in the psychological and neurological development;
- Provide a transdisciplinary evaluation and intervention, by promoting the inclusion of the parents in every session since the initial evaluation and promoting

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<sup>1</sup> It was not possible to use the real name of the program to protect the identity of the participants, so it was used a fictitious name, based on the intervention used in the program.

the articulation between the health and education professionals involved in the intervention of the child and the family;

- Enhance research by evaluating the effectiveness of the program and training relevant for professionals to implement it.

The program also has some specific objectives: conduct a comprehensive evaluation based on a developmental and ecological model, that includes:

- Parent or other caregiver interview as well as with other significant family members in child care;
- Direct observation and consequent administration of the evaluation instruments considered necessary by professionals experienced in developmental disorders in the fields of psychology, speech therapy, and occupational therapy;
- The articulation with other professionals involved in the clinical or educational intervention of the child;
- An observation of the child behavior at home, school and other important contexts;
- Provide a systematic and intensive intervention, based in the assessment mentioned above, implemented by experience professionals of the areas considered necessary;
- Promote and articulated work with other professionals involved in the clinical or educational intervention of the child, throughout the intervention;
- Complement the assessment and the intervention, when needed, with the possible recourse to other specialists, both from the team (such as music therapists) and external professional (such as physiotherapist, animal assisted therapy, balneotherapy, etc.).

## **ii. The conceptual models underlying the Program**

The DIR model was designed to help educators, clinicians and parents develop a comprehensive evaluation and plan an intervention for children with autism spectrum disorder and other developmental disorders, having into account their challenges and strengths. The DIR model and the Grennsplan Floortime approach aim to give children the foundations they need, in order to achieve strong social, emotional and intellectual skills. In the DIR model, the “D” stans for developmental and refers to the fundamental

developmental skills children need to achieve, so that they can be able to have spontaneous and empathic relationships and satisfactory academic skills, such as capacity to remain calm and regulated and to respond to all types of communication. The “I” stands for individual differences, which is the part of the model that considers that every child has its unique biologically-based way to receive, regulate, comprehend and respond to different sensations and has its own way to plan and sequence actions and ideas. Finally, the “R” stands for relationship-based, since this model defends that caregivers, educators, therapists, peers and other important people adapt their interactions according to the child individual differences and developmental skills, which allows the child to master the fundamental developmental skills. The child’s interests and natural emotion are very important to achieve successively higher levels of social, emotional and intellectual skills and they are central to the DIR model. Therefore, while the DIR model allows a comprehensive evaluation and the planification of an intervention based on the child challenges and strengths, the Greenspan Floortime approach is a technique designed to follow the child interests and simultaneously challenges the child to achieve higher social, emotional and intellectual skills (Greenspan & Wieder, n,d).

The first intensive ABA program for children with autism spectrum disorder was created by Ivar Lovaas (Roane, Fisher & James, 2016). In his study, Lovaas (1970) created an intensive intervention (forty hours) for nineteen children. The intervention included a part-time intervention with trained student therapists, who worked with the children in their homes, schools and communities, for an average of forty hours per week, for two years or more. So that they could implement the same strategies at home, in order to submit the children to the same treatment for most of their awake time every day, parents were submitted to an intensive training, working as part of the team. This treatment was based in operant conditioning theory, therefore maladaptive behaviors of each child were targeted and it was designed a different program for each maladaptive behavior, to increase their development rate. For example, aggressive and self-stimulatory behaviors were reduced by being ignored, by using the time-out technique, by developing more adaptive behaviors and as a last resource by using a loud “no” or giving a slap in the thigh.

The TEACCH model has nine values, as described by Schopler (1997). The first one is related to the awareness of the historical misunderstanding of the autism characteristics, because when this disorder was explained by the Freudian theories of

parent rejection and unconscious parental wishes, the consequences were devastating. The second one is parent-professional collaboration, which means parents observe all the diagnose process and the intervention, they receive training in order to be part of the intervention, they are seen as an expert of their child behavior and they receive support throughout all intervention process. The third one refers to the professional's commitment to improve every child capacity to learn new skills and to develop and evaluate every new therapy and strategies used to achieve this objective. The fourth value refers to the importance to differentiate between potential for skill development and deficits that need to be neutralized by changing the child environment. The fifth value refers to the assessment used by this program, which includes formal (the use of specific evaluation instruments) and informal (parent's interview), in order to truly understand the child. The sixth value refers to structured teaching, because literature shows that children with ASD learn better in structured settings than in unstructured settings (Schopler et al., 1997). Schopler, Lansing and Waters (1983) also showed that a large number of children with ASD present similar learning profiles on several characteristics. They present deficits in auditory processing and in memory and organization of things that aren't related to their specific interests. However, they are very good at visual processing, special interests and related memory skills that can be used to neutralize their deficits. Since they are so good at visual processing, it is very useful to use visual structures, such as physical layout of space, schedules of the activities, visual learning systems and visual organization of the materials. The seventh value refers to the integrated use of behavior and cognitive theory. The eighth value refers to the use of different program structures, so that the staff and the trainees can have a holistic orientation. This holistic orientation involves two aspects: every therapist is trained to work with the parents and the child and to conduct the assessment, regardless their professional discipline; in the beginning of the assessment process, the parent's questions are written down and considered along with the problems identified by the therapists. Finally, the ninth value is lifelong community service, which has into account the fact that, although there can be a development, autism doesn't have a cure, therefore these individuals have a need for a long-range plans and services.

As mentioned before, the IPIP also integrates the ESDM model. The ESDM is an adaptation of the Denver model (that can only be used with children between the age of 24 and 60 months), in order to create an early intervention for children over 12 months old. The objective of the ESDM is to reduce the severity of autism symptoms and

accelerate the child's development in all domains, but particularly in the cognitive, social, emotional and linguistic domains. This model used strategies of the Denver model and the ABA model. The ESDM has developed a specific intervention curriculum, in the form of a checklist, which should guide the whole intervention. This curriculum included several areas of development: receptive communication, expressive communication, social skills, imitation, cognition, play, fine motor skills, gross motor skills and personal independence. Each one of these areas is divided in four levels, each correspond to a progressively higher level of development, and included a set of progressively more complex tasks that the child has to learn (Rogers & Dawson, 2014).

### **iii. Theory of Mind, Executive Function Theory and Central Coherence Theory**

Children with ASD do not develop the theory of mind in the appropriate age, which is the ability to imagine other people thoughts and feelings (Baron-Cohen, Leslie & Friths, 1985). By acquiring the theory of mind, a person can find an explanation for another person behavior, can imagine a variety of mental states and can predict what the other person might do next. Because children with ASD develop this capacity late, they find behavior of others to be confusing, unpredictable and even frightening. Most people associate the theory of mind as just the cognitive component of empathy (only the identification of someone else and our own mental states). Missing from this, is the second component of empathy, the response element, which refers to the capacity to have an appropriate emotional response to other people's thoughts and feelings. ASD individuals also present deficits in this second element (Baron-Cohen, 2009).

Executive function refers to a variety of process that helps individuals to maintain an appropriate set of problem-solving skills, that guide their future behaviors (Volkmar et. Al., 2014). The investigation around the executive functions was essential to understand most of the ASD characteristics, such as small flexibility, deficits in working memory the existence of routines, resistance to changes, lack of initiative and difficulties in problem-solving (Hill, 2008; Ozonoff & Griffith, 2000; Ozonoff, Rogers & Hendren, 2003, cited in Aguiar, 2009; Ozonoff, South & Provencal, 2005). Flexibility is considered to be the most affected executive function in ASD children PEA (Hill, 2008; Ozonoff & Griffith, 2000, cited in Aguiar, 2009; Ozonoff et. al., 2005), which is the capacity to change a different thought or action, according to the changes in the situations or in the contexts. Some ASD characteristics, such as the existence of constant and invariable routines, resistance to changes and stereotyped behaviors are often due to the lack of

flexibility, which also appear to be responsible for the deficits in the regulation and modulation of motor acts (Hill,2008, cited in Aguiar, 2009).

Frith (2003, cited in Aguiar, 2009) describes Central Coherence as the cognitive capacity individuals have to integrate and process information in global and contextualized terms, thus extracting a general meaning from perceived stimuli, often at the cost of not processing and retaining details. Children with ASD present deficits in this capacity. They tend to focus on details when processing information, thus presenting a fragmented information processing. However, because of this characteristic, they have a great facility in performing tasks in which the processing of details is advantageous. Children try to understand the meaning behind the words, gestures and objects, since an early age, to understand the world around them. ASD children also do this, but they tend to establish different theories and hypothesis. For example, an experiment conducted by Schuler and Borman (1980, cited in Clerq, 1999) showed that ASD children do not present difficulties in categorization tasks based on visual similarities between objects (e.g. combs of various colors), similar objects (e.g. a red plastic car and a brown metal car) and between broken and whole objects (e.g. broken spring and full spring). However, they present difficulties in tasks where similarity in terms of perception decreases and similarity in meaning increases, such as matching two similar objects (e.g. a comb and a brush).

#### **iv. The IPI**

The IPI is a psychoeducational approach, since it bases its intervention in the individual psychological evaluation, which allows to respond to the enormous variety through which the ASD manifests from individual to individual and in the same individual throughout life. It is also an integrated approach for three reasons. First, it integrates knowledge from professionals of different areas and from the parents of the child (transdisciplinary intervention). Second, integrates in the central model of the intervention (TEACCH), strategies from other two models, who also have strong empirical evidence. (DIR/Greenspan Floortime approach and ABA). Finally, it also integrates information from child developmental in general and tree psychological theories (Theory of Mind, Executive Function Theory and Central Coherence Theory), which emerged from intensive scientific research related to specific aspects of the development of children with ASD, which allowed a better understanding of their behavior and their specific way of thinking and learning. These theories allow us to

identify the deficits and the strengths of ASD children, which should be included in the intervention programs, to promote their global development (Coelho & Aguiar, 2013).

Therefore the IPI is essentially a preventive approach, not only a remedial approach, for two reasons: (1) by integrating the theoretical knowledge mentioned above, it's possible to evaluate and intervene in the socioemotional and cognitive precursors, which underlies the specific deficits of this disorder; (2) it uses strategies from the TEACHH model, which allow to prevent maladaptive behaviors and promote the child development, by manipulating the contexts variables and (Coelho & Aguiar, 2013).

**v. Components of the program**

The components of the IPIP include psychology, speech therapy, occupational therapy and music therapy. The intervention occurs not only in the clinic, but also in children day-care or home, when necessary.

**vi. The intervention team**

The transdisciplinary team that implements this program is formed by professionals from psychology, speech therapy, occupational therapy and music therapy. In most cases, an intern of psychology goes to the child home or day-care, to help implement strategies suggested by the various professionals to the parents and other family members or to the child teacher. The team has weekly meetings, in order to discuss the cases and alternative strategies. Each child has an individual specific team, formed by the professionals directly working with the child, one of them being the case supervisor. The team members are in constant articulation not only with each other, but also with the family and the child's day care settings, so that the objectives and strategies of the intervention (that can develop over time) are continuously monitored and possibly redefined.

**vii. The individual plan for each child**

After the initial assessment, the professionals establish with the parents the objectives for each individual child. Based on these objectives, it is decided which professionals will intervene with the child and the intensity (hours per week) of each program component. Therefore, some children may have intervention in all components, while others do not and intensity of each child intervention may also be different. Some children may be involved in more psychology sessions, others may have more occupational therapy sessions per week. Some may have an intern come to their homes or day-care and others do not. However, since one of the program guidelines is to provide

a systematic and intensive intervention, every child must have at least four hours of intervention per week. Throughout the intervention, the needs of the children can change, as well as the objectives of the intervention. Therefore, the intervention plan can be modified based on the reevaluation of the child.

## **II. Participants**

Currently 25 children participate in the IPIP and only two children entered the program after the study started and could not participate because of that. Another seven children were also not included in this study, because four could not be evaluated in the pre and post-test moment defined, two children were not diagnosed with autism spectrum disorder and the parents of one child did not approve the participation on this study. One child stopped the intervention between the pre and post-test, and therefore was not included in this study.

Of the 15 children that participated in this study, eight had the diagnose of autism spectrum disorder made by experienced professionals and six had compatible characteristics but did not had the formal diagnose. For five of this six children, the first evaluation developed by the team was not conclusive and there was no reevaluation during the time of this study. The other child was very young, and therefore it is difficult to confirm the diagnose of ASD. One child had West Syndrome. Since it presents similar characteristics to autism spectrum disorder and because the intervention was similar to the intervention of the other children, this child was included in the study. There were 12 boys and 3 girls (corresponding to the gender ratio reported in the literature 4:1 (APA, 2013)), with a mean age of 4,07. years. The exposition of these 16 children to intervention in the program ranged from 6 to 47 months.

## **III. Measures**

In order to evaluate the effects of the IPIP program in the children Development and Symptom Severity, participants were evaluated at two different moments with the Psychoeducational Profile: TEACH Individualized Psychoeducational Assessment for Children with Autism Spectrum Disorders- Third Edition (PEP-3). Between the pre and post-test six months passed. The PEP-3 provides important information from two complementary sources: a standardized, norm-referenced scale, that assesses the development of motor and communication skills and the presence of maladaptive behavior; as well as an informal procedure to obtain information from parents or caregivers. Only the first source of information was used in this study. The scale is

composed by ten subtests and three composites. Progress was analyzed based on in the composites and subtest, but not at the item level because of the numerous items that compose this instrument (172).

The children's development is evaluated by the cognitive verbal and preverbal, expressive language, receptive language, fine motor, gross motor and visual-motor imitation subtests and by the communication composite (composed by the cognitive verbal and preverbal, expressive language, receptive language subtests) and the motor composite (composed by the, fine motor, gross motor and visual-motor imitation). The children's autism symptom severity is evaluated by the affective expression, social reciprocity, characteristic motor behaviors and characteristic verbal behaviors subtests and the maladaptive behavior composite (composed by these last subtests).

This instrument provides the percentile rank and adaptive level for each subtest and for each composite. The percentiles were based on a USA sample of children with autisms and other pervasive developmental disorders. The percentile ranks can be used to determine the child's adaptive level in each area. Although the PEP-3 is not an instrument to provide a diagnose, the adaptive level for the maladaptive behavior can be useful to help make accurate diagnose and understand the position of the child within the autism spectrum. Percentile ranks above 89 are within the adequate adaptive level range, between 75 and 89 are within the mild adaptive level range, between 25 and 74 are within the moderate adaptive level range and below 25 are within the severe adaptive level range. The PEP-3 also provides the developmental age for the cognitive verbal and pre-verbal, expressive language, receptive language, fine motor, gross motor and visual-motor imitation subtests and in the communication and motor composites. The developmental age was determined using a sample of normally developing children (Schopler, Lansing, Reichler & Marcus, 2004).

Two additional questionnaires were developed for the purposes of this study, answered in the second moment of the children evaluation. One, answered by the parents and the other answered by the program professionals. The literature emphasizes the challenges transdisciplinary team work, as discussed above, and therefore the questionnaire to the program professionals aimed to evaluate their satisfaction with the team work, with the communication with the supervision and their satisfaction with the program. The literature also suggests how self-efficiency affects work performance, so this questionnaire also aimed to evaluate professionals' sense of self-efficiency. This

questionnaire had 34 items answered in a scale ranging from 1 (completely disagree) to 5 (completely agree). The parents' questionnaire has 57 items, also answered in a scale of one (completely disagree) to five (completely agree). This questionnaire aimed to evaluate the parent's satisfaction about the program in general and about each specific program component. Based on the consequences of having a child with ASD, described in the above literature, this questionnaire also evaluates the extent to which parents feel the program professionals helped them improve their relationship with their child with ASD, their family relationships in general and to deal with associated emotional difficulties.

## Results

### I. Program effects on children: Pre and post-test comparison

#### i. Analysis of the children's adaptive level

Table 1 Children's adaptive level in pre-test

|                                 | Adequate | Mild | Moderate | Severe |
|---------------------------------|----------|------|----------|--------|
| Cognitive verbal and pre-verbal | 5        | 5    | 5        | 0      |
| Expressive language             | 2        | 7    | 6        | 0      |
| Receptive language              | 3        | 7    | 5        | 0      |
| Fine motor                      | 4        | 2    | 9        | 0      |
| Gross motor                     | 0        | 3    | 11       | 0      |
| Visual-motor imitation          | 1        | 2    | 12       | 0      |
| Affective Expression            | 3        | 7    | 5        | 0      |
| Social Reciprocity              | 1        | 2    | 9        | 3      |
| Characteristic motor behaviors  | 1        | 2    | 9        | 3      |
| Characteristic verbal behaviors | 0        | 2    | 6        | 7      |
| Communication composite         | 3        | 6    | 6        | 0      |
| Motor composite                 | 2        | 2    | 11       | 0      |

|                                |   |   |   |   |
|--------------------------------|---|---|---|---|
| Maladaptive behavior composite | 0 | 5 | 8 | 2 |
|--------------------------------|---|---|---|---|

At the pre-test moment, as table 1 shows, in the in the three composites, most children were in the moderate adaptive level. Most children were in the mild adaptive level in the expressive language, receptive language and affective expression subtests. In the fine and gross motor, visual-motor imitation, social reciprocity and characteristic motor behavior subtests, most children were in the moderate adaptive level. Concerning the characteristic verbal behavior subtests, most children were in the severe adaptive level.

Table 2 progress of children’s adaptive level

|                                 | Number of children who improved in the adaptive level | Number of children who decreased in the adaptive level | Number of children who showed no changes in the adaptive level |
|---------------------------------|-------------------------------------------------------|--------------------------------------------------------|----------------------------------------------------------------|
| Cognitive verbal and pre-verbal | 2                                                     | 6                                                      | 7                                                              |
| Expressive language             | 3                                                     | 4                                                      | 8                                                              |
| Receptive language              | 2                                                     | 4                                                      | 9                                                              |
| Fine motor                      | 2                                                     | 3                                                      | 10                                                             |
| Gross motor                     | 3                                                     | 0                                                      | 12                                                             |
| Visual-motor imitation          | 3                                                     | 2                                                      | 10                                                             |
| Affective Expression            | 4                                                     | 3                                                      | 8                                                              |

|                                 |   |   |    |
|---------------------------------|---|---|----|
| Social Reciprocity              | 3 | 2 | 10 |
| Characteristic motor behaviors  | 4 | 3 | 8  |
| Characteristic verbal behaviors | 1 | 3 | 11 |
| Communication composite         | 2 | 1 | 12 |
| Motor composite                 | 4 | 0 | 10 |
| Maladaptive behavior composite  | 2 | 3 | 10 |

As table 2 shows, concerning the adaptive level most children (11) showed no changes. Only one child showed a positive progress and three children showed a decrease in the progress.

Child 8 showed improvements in the maladaptive behavior composite and no changes in the communication and motor composites. This child showed improvements in most subtests (see appendix 8). Child 9 showed no changes in all three composites and in all subtests (see appendix 9). Children 1, 2, 5, 13 and 15 showed no changes in all three composites and most subtests (see appendixes 1, 2, 5, 13 and 15). Children 7 and 12 showed progress in the communication and motor composite, but no changes in the maladaptive behavior composite and in most subtests (see appendixes 7 and 12). Child 3 showed improvements in the motor composite, but no changes in the communication and maladaptive behavior and in most subtests (see appendix 3). Child 14 showed a decrease in the maladaptive behavior composite and no changes in the communication and motor composite and in most subtests (see appendix 4). Child 10 showed an improvement in the maladaptive behavior composite, but no changes in the communication and motor composite and in most subtests (see appendix 10). Child 6 showed no changes in the three composites and a decreased in most subtests (see appendix 6). Child 4 showed an improvement in the motor composite, no changes in the communication composite and a decreased in the maladaptive behavior composite and in most subtests (see appendix 4).

Child 11 showed no changes in the motor composite and a decreased in the communication and maladaptive composite and in most subtests (see appendix 11).

**ii. Analysis of the children´s developmental age**

Table 3 Children´s chronologic and developmental age (in months) in the composites at pre-test

|    | Chronologic age |  | Developmental age       |                 |
|----|-----------------|--|-------------------------|-----------------|
|    |                 |  | Communication composite | Motor composite |
| 1  | 49              |  | 23                      | 30              |
| 2  | 51              |  | 23                      | 25              |
| 3  | 54              |  | 36                      | 31              |
| 4  | 54              |  | 42                      | 36              |
| 5  | 46              |  | 20                      | 28              |
| 6  | 41              |  | 40                      | 36              |
| 7  | 37              |  | 29                      | 29              |
| 8  | 36              |  | 32                      | 29              |
| 9  | 38              |  | 19                      | 27              |
| 10 | 53              |  | 45                      | 41              |
| 11 | 35              |  | 27                      | 24              |
| 12 | 44              |  | 34                      | 33              |
| 13 | 34              |  | 38                      | 30              |
| 14 | 42              |  | 25                      | 41              |
| 15 | 32              |  | 20                      | 28              |

At the pre-test moment, all children presented a lower developmental age than their chronological age in the two composites, as table 3 shows.

Table 4 Children’s chronologic and developmental age (in months) in the subtestes at pre-test

| Chronological age |    | Developmental age               |                     |                    |            |             |                        |
|-------------------|----|---------------------------------|---------------------|--------------------|------------|-------------|------------------------|
|                   |    | Cognitive verbal and pre-verbal | Expressive language | Receptive language | Fine motor | Gross motor | Visual-motor imitation |
| 1                 | 49 | 28                              | 22                  | 20                 | 29         | 32          | 29                     |
| 2                 | 51 | 27                              | 21                  | 22                 | 24         | 24          | 24                     |
| 3                 | 54 | 50                              | 24                  | 33                 | 32         | 31          | 29                     |
| 4                 | 54 | 56                              | 27                  | 44                 | 46         | 32          | 30                     |
| 5                 | 46 | 29                              | <12                 | 19                 | 28         | 30          | 27                     |
| 6                 | 41 | 53                              | 33                  | 33                 | 42         | 31          | 37                     |
| 7                 | 37 | 38                              | 24                  | 25                 | 29         | 28          | 29                     |
| 8                 | 36 | 36                              | 28                  | 31                 | 32         | 29          | 27                     |
| 9                 | 38 | 25                              | 20                  | 12                 | 26         | 27          | 27                     |
| 10                | 53 | 49                              | 37                  | 48                 | 46         | 36          | 42                     |
| 11                | 35 | 33                              | 27                  | 22                 | 23         | 22          | 26                     |
| 12                | 44 | 45                              | 26                  | 31                 | 39         | 33          | 31                     |
| 13                | 34 | 42                              | 35                  | 38                 | 33         | 33          | 25                     |
| 14                | 42 | 27                              | 24                  | 23                 | 28         | 31          | 22                     |
| 15                | 32 | 29                              | <12                 | 19                 | 31         | 25          | 28                     |

Table 4 shows that all children showed a lower developmental age compared to their chronological age in the expressive language, receptive language, gross motor and visual motor imitation subtestes. Most children also showed a lower developmental age as opposed to their chronological age in the cognitive verbal and pre-verbal (9) and fine motor (14) subtestes.

Table 5 Progress of children's developmental age

|                                    | Number of children<br>who improved in the<br>developmental age | Number of children<br>who decreased in the<br>developmental age | Number of children<br>who showed no<br>changes in the<br>developmental age |
|------------------------------------|----------------------------------------------------------------|-----------------------------------------------------------------|----------------------------------------------------------------------------|
| Cognitive verbal and<br>pre-verbal | 10                                                             | 5                                                               | 0                                                                          |
| Expressive language                | 11                                                             | 3                                                               | 1                                                                          |
| Receptive language                 | 12                                                             | 2                                                               | 1                                                                          |
| Fine motor                         | 11                                                             | 3                                                               | 1                                                                          |
| Gross motor                        | 13                                                             | 1                                                               | 1                                                                          |
| Visual-motor imitation             | 12                                                             | 2                                                               | 1                                                                          |
| Communication<br>composite         | 11                                                             | 3                                                               | 1                                                                          |
| Motor composite                    | 13                                                             | 2                                                               | 0                                                                          |

As table 5 shows, concerning children's developmental age, most children (13) showed improvements from pre to post-test.

Children 7, 8, 9, 12 and 14 showed improvements in all three composites and in all subtests (see appendixes 7, 8, 9, 12 and 14). Children 1, 3, 6, 10 and 15 showed improvements in all three composites and in most subtests (see appendixes 1, 3, 6, 10 and 15). Child 2 showed no changes in the communication composite and improvements in the motor composite and most subtests (see appendix 2). Child 4 showed a decreased in the communication composite, but improvements in the motor composite and in most subtests (see appendix 4). Child 5 showed a decreased in the motor composite, but improvements in the communication composite and most subtests (see appendix 5). Child

13 showed improvements in the motor composite, but a decreased in the communication composite and in most subtests (see appendix 13). Child 11 showed a decreased in the two composites and in most subtests (see appendix 11).

### I. Parent’s evaluation of the program

Of the thirty-six parents, sixteen answered the questionnaire (44,4%). Eight were men and eight were woman, with a mean age of 35,80. The number of children per parent ranged from one to four. Most parents (56,3%) were from an urban area.

The participants in this study did not receive intervention at home or music therapy, and therefore these components were not analyzed. The reliability was calculated using Cronbach’s alpha for all components together and for each program component separately, in order to analyze if it was possible to calculate a mean for global satisfaction and each program component. As seen in table 6, the alpha value was very high for global satisfaction (0.97), and high for psychology (0.87), for speech therapy (0.80), for occupational therapy (0.83) and for pair intervention (0.83) However, for the intervention in kindergarten the alpha was relatively lower (0.63).

Table 6 Parent’s satisfaction

|                    | Global Satisfaction | Psychology Satisfaction | Speech Therapy Satisfaction | Occupational Therapy Satisfaction | Kindergarten Intervention Satisfaction | Pair Intervention Satisfaction |
|--------------------|---------------------|-------------------------|-----------------------------|-----------------------------------|----------------------------------------|--------------------------------|
| Alpha              | 0,97                | 0,87                    | 0,80                        | 0,83                              | 0,63                                   | 0,83                           |
| Mean               | 4,05                | 4,46                    | 4,18                        | 4,09                              | 3,90                                   | 4,31                           |
| Standard Deviation | 0,45                | 0,49                    | 0,57                        | 0,74                              | 0,68                                   | 0,42                           |

As table 6 shows, the global satisfaction about the program shows that most parents are satisfied with the program. Parents showed more satisfaction with the psychology component, and pair intervention. They showed less satisfaction with the kindergarten intervention component. Although lower than the other scores, this mean score shows parents are also satisfied with the kindergarten intervention.

Table 7- Parent's questionnaire items

|                                                                               | 1    | 2    | 3    | 4     | 5     |
|-------------------------------------------------------------------------------|------|------|------|-------|-------|
| Satisfaction with the child progress                                          | 0/16 | 0/16 | 3/16 | 11/16 | 2/16  |
| Program corresponds to expectations                                           | 0/16 | 0/16 | 3/16 | 11/16 | 2/16  |
| Program responds to needs                                                     | 0/16 | 1/16 | 3/16 | 9/16  | 3/16  |
| Program responds to child needs                                               | 0/16 | 2/16 | 1/16 | 9/16  | 4/16  |
| Satisfied with the variety of specialties the program offers                  | 0/16 | 2/16 | 1/16 | 8/16  | 6/16  |
| Therapists consider my opinion                                                | 0/16 | 0/16 | 0/16 | 8/16  | 8/16  |
| Therapists involve me in my child intervention                                | 0/16 | 0/16 | 0/16 | 8/16  | 8/16  |
| Collaboration between parent and therapists                                   | 0/16 | 0/16 | 0/16 | 5/16  | 11/16 |
| Privacy is respected                                                          | 0/16 | 0/16 | 0/16 | 3/16  | 13/16 |
| Therapists help me have a better control of child behavior                    | 0/16 | 0/16 | 0/16 | 8/16  | 8/16  |
| Therapists help respond better to child needs                                 | 0/16 | 0/16 | 0/16 | 9/16  | 7/16  |
| Therapists help feel less stressed                                            | 0/16 | 1/16 | 3/16 | 9/16  | 3/16  |
| Therapists offer emotional support                                            | 0/16 | 1/16 | 4/16 | 8/16  | 3/16  |
| With the therapists help, I'm less tired                                      | 0/16 | 2/16 | 6/16 | 5/16  | 3/16  |
| The therapists help me have a better relationship with my child               | 0/14 | 0/14 | 0/14 | 10/14 | 4/14  |
| The therapists help me have a better relationship with my spouse              | 0/8  | 2/8  | 3/8  | 2/8   | 1/8   |
| The therapists help my family to have a better relationship                   | 0/8  | 1/8  | 3/8  | 3/8   | 1/8   |
| The therapists help my child and his bother/sister have a better relationship | 0/3  | 1/3  | 1/3  | 1/3   | 0/3   |
| The therapists help my child's bother/sister when they need                   | 0/3  | 1/3  | 0/3  | 2/3   | 0/3   |
| The therapists help my family to have good moments with each other            | 0/10 | 0/10 | 4/10 | 4/10  | 2/10  |
| The therapists help me manage my time better                                  | 0/10 | 1/10 | 6/10 | 2/10  | 1/10  |

|                                       |      |      |      |      |      |
|---------------------------------------|------|------|------|------|------|
| I'm satisfied with this program costs | 0/16 | 2/16 | 8/16 | 5/16 | 1/16 |
|---------------------------------------|------|------|------|------|------|

Despite the high general satisfaction, some parents were not satisfied with certain aspects of the program. As table 7 shows, one parent does not feel this program responds to his/her personal needs and two parents disagree this program responds to their children needs. One parent disagrees that the therapists help with regards to felling less stressed, one disagrees the therapists offers emotional support and two disagree the therapists help them feel less tired. Two parents are not satisfied with the variety of specialties the program presents and two parents are not satisfied with the costs of the program. Of the eight parents who responded to these questions, two did not feel the therapists helped them have a better relationship with their spouse and one does not feel the therapists help his/her family to have a better relationship. Of the three parents who responded to these questions, one does not agree that the therapists help his/her child to have a better relationship with his/her brother or sister and one does not feel the therapists help their child's brother or sister when they need. Finally, of the ten parents who responded to this question, one does not agree that the therapists help with time management.

One parent would like that the program to offer an additional specialty, animal assisted therapy with dogs (see appendix 20). Three parents wished their child had more intervention in occupational therapy, three in speech therapy, two in intervention in the kindergarten and one wished their child had music therapy sessions (see appendix 21).

**II. Professional's evaluation of the program**

Table 8 Professional's satisfaction

| Coefficient | Mean | Standard  |
|-------------|------|-----------|
| alpha       |      | Deviation |
| 0,93        | 4,56 | 0,50      |

Of the 16 professionals, 10 responded to the questionnaire (62,5%). Seven were therapists and three were interns. The reliability was calculated using Cronbach's alpha, in order to analyze if it was possible to calculate a mean for the therapist's global satisfaction. Table 8 shows that the alpha for the scale was high (0,93), therefore a global satisfaction score was calculated. The professional's global satisfaction about the program showed that team members are generally satisfied with the program.

Table 9 Professional's questionnaire items

|                                                                                                      | 1    | 2    | 3    | 4    | 5    |
|------------------------------------------------------------------------------------------------------|------|------|------|------|------|
| I'm capable of working as a team                                                                     | 0/10 | 0/10 | 0/10 | 6/10 | 4/10 |
| This team is able to do a good job together                                                          | 0/10 | 0/10 | 3/10 | 5/10 | 2/10 |
| There is a good work environment in this team.                                                       | 0/10 | 2/10 | 2/10 | 4/10 | 2/10 |
| There is a good relationship between the team and supervision.                                       | 0/10 | 1/10 | 1/10 | 5/10 | 3/10 |
| My opinions and suggestions about the cases are considered.                                          | 0/10 | 0/10 | 1/10 | 5/10 | 4/10 |
| I'm able to give my opinions and suggestions about the cases.                                        | 0/10 | 0/10 | 1/10 | 3/10 | 6/10 |
| I can help my colleagues improve their work.                                                         | 0/10 | 0/10 | 3/10 | 3/10 | 4/10 |
| I can help to improve the team work.                                                                 | 0/10 | 0/10 | 0/10 | 5/10 | 5/10 |
| I feel able to assist in collaboration between team members and supervision.                         | 0/10 | 0/10 | 4/10 | 2/10 | 4/10 |
| I can overcome most problems related to team work.                                                   | 0/10 | 0/10 | 3/10 | 5/10 | 2/10 |
| I can ask my colleagues and supervision for help, when I'm having difficulties working with a child. | 0/10 | 0/10 | 0/10 | 4/10 | 6/10 |
| I can ask my colleagues and supervision for help, when I'm having a problem with a parent.           | 0/10 | 0/10 | 0/10 | 4/10 | 6/10 |
| I'm able to pass strategies to my colleges.                                                          | 0/10 | 0/10 | 2/10 | 1/10 | 7/10 |

|                                                                                                 |      |      |      |      |      |
|-------------------------------------------------------------------------------------------------|------|------|------|------|------|
| I'm able to use the strategies my colleges pass to me.                                          | 0/10 | 0/10 | 1/10 | 3/10 | 6/10 |
| I have access to all the materials and equipment I need to do my job.                           | 1/10 | 1/10 | 5/10 | 3/10 | 0/10 |
| I'm able to do a good job and achieve the objectives defined.                                   | 0/10 | 0/10 | 0/10 | 4/10 | 6/10 |
| The methodologies of this program are effective.                                                | 0/10 | 1/10 | 2/10 | 4/10 | 3/10 |
| This program has good objectives.                                                               | 0/10 | 0/10 | 1/10 | 4/10 | 5/10 |
| I'm satisfied with this program.                                                                | 0/10 | 1/10 | 1/10 | 4/10 | 4/10 |
| I feel the parents consider my opinion and suggestions.                                         | 0/10 | 0/10 | 2/10 | 4/10 | 4/10 |
| I'm able to express my opinion and suggestions to the parents.                                  | 0/10 | 0/10 | 1/10 | 2/10 | 7/10 |
| I'm able to create a good relationship with the parents.                                        | 0/10 | 0/10 | 0/10 | 4/10 | 6/10 |
| I'm able to involve the parents in their child intervention.                                    | 0/10 | 0/10 | 1/10 | 3/10 | 6/10 |
| I'm able to help the parents deal with their child in a better way.                             | 0/10 | 0/10 | 1/10 | 3/10 | 6/10 |
| I'm able to make the parents comfortable in my sessions.                                        | 0/10 | 0/10 | 1/10 | 3/10 | 6/10 |
| I'm able to overcome most of the problems related to the relationships with the parents.        | 0/10 | 0/10 | 3/10 | 3/10 | 4/10 |
| I'm able to develop a good relationship with the children I work, even the most difficult ones. | 0/9  | 0/9  | 1/9  | 1/9  | 7/9  |

|                                                                                                           |      |      |      |      |      |
|-----------------------------------------------------------------------------------------------------------|------|------|------|------|------|
| I can help a child even when she does not have good support at home.                                      | 0/10 | 0/10 | 0/10 | 7/10 | 3/10 |
| I'm able to motive the children I work with during the sessions.                                          | 0/10 | 0/10 | 0/10 | 5/10 | 5/10 |
| I'm able to control the disruptive behaviors of the children I work with.                                 | 0/9  | 0/9  | 0/9  | 7/9  | 2/9  |
| I'm able to prevent disruptive behaviors of the children I work with.                                     | 0/10 | 0/10 | 1/10 | 7/10 | 2/10 |
| I feel able to make children enjoy working with me.                                                       | 0/10 | 0/10 | 0/10 | 3/10 | 7/10 |
| When a child does not respond to the intervention as it was expected, I can find alternatives strategies. | 0/10 | 0/10 | 0/10 | 6/10 | 4/10 |
| I have good academic training to work with these children.                                                | 0/10 | 0/10 | 1/10 | 4/10 | 5/10 |

Table 9 shows that most team members were satisfied with the various aspects of the program. However, two members of staff feel there is not a good work environment and one does not feel there is a good relationship between the team and the supervision. There is also one person who does not agree with the methodologies of this program. One person affirmed not to be satisfied with the program. Two members were also unsatisfied with the materials and equipment they have access to, one being completely unsatisfied.

## **Discussion**

The primary objective of this study was to develop and implement a comprehensive method for the evaluation of early intervention programs for children with autism spectrum disorder. Based on an updated literature review, this study identified and followed some of the main recommendations for the evaluation of early intervention programs, (Bradshaw, Steiner, Gengoux & Koegel, 20015), including (a) the description of the empirical evidence and theoretical concepts underlying the models on which the program is based, the clear statement of intervention goals and strategies that are based on the empirical evidence and theoretical concepts, (b) evaluation of parent involvement, (c) length and intensity of the program, (d) parents' perceived feasibility and acceptability of the program, and (e) the assessment of developmental, diagnostic and social-communication outcomes of the children. However, it was not possible to evaluate certain components that the literature also shows to be important, which is a limitation of this study. This components included moderators of outcome, the participant's degree of exposure, the participant's degree of engagement, the adherence (the extent to which the intervention complied with the program) and the quality of services provided, notably how well the caseworker masters the program, the characteristics related to the caseworker's know-how and the relationship between the caseworker and the program recipient (Bradshaw, Steiner, Gengoux & Koegel, 20015; Caron, Bérubé and Paquet, 2017).

The first objective was to describe the intervention program, including the theoretical models on which the program was based, the intervention goals, strategies and the length and intensity of the program. The IPIP program integrates knowledge from different professional areas and from the parents of the children who participate in the program. It also integrates in its central model, the TEACCH model, strategies from four other models with strong empirical evidence (DIR/ Greenspan Floortime approach, ABA and ESDM). Finally, it also includes information from child developmental in general and three psychological theories (Theory of Mind, Executive Function and Central Coherence Theory), which emerged from intensive scientific research related to the specific aspects of the developmental of children with ASD (Coelho & Aguiar, 2013). Therefore, this program appears to be based in models and psychological theories with strong empirical evidence. In a small semi-structured interview, the authors of this approach explained they considered that these four models and three psychological

theories complement each other. The TEACCH models promotes a structured intervention, so the child understands clearly what is going to happen in each session. One of the activities, generally the last one, can be a board game or a play, that meets the child's interests, using the strategies the DIR model and the Greenspan floortime approach. The ABA model is based on the operant conditioning the positive reinforcement, the applied behavior analysis, among other aspects, consequently the strategies this model uses complement the other models. The ESDM model is the only one of these four models that is specific for early intervention. This model complements the others, in the sense that it enriches the establishment of general and specific objectives, outlined for the early stage of development. The three psychological theories mentioned before, explain most of the difficulties of ASD children, so they must always be included in the objectives of the intervention and must be overcome with the strategies of these four models.

This approach allowed the clear statement of intervention strategies and the definition of five general and seven specific clear objectives of the program. The program is designed for children for pre-school aged children up until six years old. The participants in this study entered the program at different moments, so some children did have more intensive intervention than others when this study began. The intensity of the program varies according to each child's individual plan. Sometimes, the child and family needs changes and the child individual plan is modified in order to meet the family's needs, consequently changing factors like intensity of intervention. The individual plan and intensity of the program of some participants changes during this study, so it was not possible to estimate the correct intensity of each child intervention.

The second objective was to evaluate the program effects on children's development and autism symptom severity, by evaluating them at two different moments, pre and post-test six months apart, that did not correspond to the beginning and the finalization of the intervention, with PEP-3. The comparison between the two moments in the communication and motor composites (and the subtests that contribute to each one) allowed to evaluate progress in the children's development, while the comparison in the maladaptive behavior composite (and the subtests that contribute to this composite) allowed to evaluate the progress in the autism symptom severity. At the pre-test moment, concerning the developmental age, all children presented a developmental age lower than what it would be expected for typically developing children with the same age, in the

communication and motor composite and in the expressive language, receptive language, gross motor and visual-motor imitation subtests. In the cognitive verbal and pre-verbal and fine motor subtests, most children presented a developmental age lower than what it would be expected for typically developing children with the same age. Regarding the adaptive level, most children were in the moderate adaptive level in the three composites, which means most children had mild difficulties in communication and motor skills for what it would be expected for ASD children and presented moderate autistic symptoms. Most children had mild difficulties in comparison to what would be expected for ASD children regarding their cognitive abilities, their ability to express them and their ability to understand spoken language. Most children presented moderate difficulties for what it would be expected for ASD children in their fine and gross motor skills, in their ability to social interact and presented moderated motor behaviors characteristics of this disorder. Most children presented severe verbal behaviors characteristic of this disorder.

Concerning the developmental age between the pre and post-test the results show a general pattern of improvement. Most children showed improvements in the communication (11) and motor composite (13), which means that most children improved their communication and motor skills. Regarding the subtests, most children also showed an improvement in the cognitive verbal and pre-verbal (10), expressive language (11), receptive language (12), fine motor (11), gross motor (13) and visual-motor imitation (12) subtests. Most children (13) showed a positive progress and only two children showed a negative progress. Child 13 showed progress in the motor composite and a decreased in the communication composite. This child showed a decrease in most subtests, which means the child had a general negative progress. It is important to notice that the therapists who work with this child explained that the intervention was irregular, because the child would miss a lot of sessions, which could explain these results. Child 11 showed a decreased in two composites and in most subtests, which means this child also had a negative progress. It is important to notice that during this study, there was a suspicion that this child had epilepsy with absence seizures, which could explain this child results.

By analyzing the progress in the developmental age, the results showed that 13 children had a positive progress in their development. These results show that this program seems to have a positive effect in children's development, which supports the literature, that illustrates that early intervention programs tend to show improvements in the children's development, in some areas such as expressive and receptive language and

cognitive abilities. The literature also shows gains in eye contact and joint attention, however, it was not evaluated the progress in specific skills with the PEP-3, only in the composites and subtests in general, so it was not possible to evaluate the progress in specific aspects like these two (Bradshaw, Steiner, Gengoux & Koegel, 2015; Rollins, Campbell, Hoffman & Self, 2016; Baú, 2018).

However, concerning the adaptive level, most children showed no changes in the communication composite (12) and in the motor composite (10), which shows that there was no changes in the adaptive level. In the maladaptive behavior composite most children (10) also did not show any changes, therefore, this program also had no significant effects in children autistic symptom severity. This means that most children did not change their position within the autism spectrum. Only one child, child 8, showed a positive progress, since this child showed progress in the maladaptive behavior composite, meaning this child reduced the autistic symptom severity and although there weren't any changes in the communication and motor composite, there were improvements in most subtests (6). Three children showed a negative progress. Child 6 did not show any changes in the three composites, but a decrease in most subtests. Child 4 showed improvements in the motor composite, meaning the child improved her motor skills, no changes in the communication composite, but a decrease in the maladaptive behavior, meaning this child improved her maladaptive behaviors, and a decreased in most subtests. Child 11 showed no changes in the motor composite, but a decrease in most subtests and in the communication and maladaptive behavior composite, meaning this child decreased the communication skills and improved the maladaptive behaviors. However, it is important to not forget that during this study there was a suspicion that this child had epilepsy with absence seizures, which could explain this child results

Concerning the subtests, most children also did not show any changes in the cognitive verbal and pre-verbal (7), expressive language (8), receptive language subtest (9), fine motor (10), gross motor (12), visual-motor imitation (10), affective expression (8), social reciprocity (10) characteristic motor behaviors (11) and characteristic verbal behaviors subtests (11). These results are not totally consistent with the literature, since early intervention programs tend to show improvements in the children's adaptive level, in areas such as in expressive and receptive language and cognitive abilities. Early intervention programs also tend to decrease of autism symptoms severity (Bradshaw, Steiner, Gengoux & Koegel, 2015; Rollins, Campbell, Hoffman & Self, 2016).

Having these results into account, this program shows positive effects in children's development, especially in the gross motor subtest and the motor composite, where 13 children showed improvements. However, there were no significant effects in the autism symptom severity, which is an aspect that the program must improve in the future. However, it is important to notice that the autism symptom severity can be relevant for the intervention of some children that display severe behavior problems that interfere negatively in their daily life, for example, but not for other children. All depends on the intervention objective developed by the child's parents and professionals in the child's individual plan. In addition, autism spectrum disorder shows a variety of symptoms and some children present all the symptoms, while others may not. The severity of this symptoms may also vary during the children's development. Also, it is important to remember that the adaptive level is calculated using the percentile ranks and even if there is an improvement or a decrease in the percentile ranks, it may not be sufficient to produce changes in the adaptive level. This means that the children must present a large improvement in the percentile ranks to improve their adaptive level, which does not happen in the developmental age, so it is not surprising that it is more difficult to find changes in the adaptive level than in the developmental age.

In interpreting results of this study, it should be noticed that the pre-test does not correspond to the beginning of intervention and the post-test does not correspond to the end of the intervention, which in most cases was already in progress and continued after the study. This may have contributed to smaller positive changes in children's outcomes from pre to post-test. Future studies should control if children had received some kind of intervention before they entered the program, which also could affect their progress. It would also be interesting to evaluate the progress in each item, to evaluate progress in specific aspects, such eye contact and joint attention. Future studies should take this into account.

The third objective was to evaluate the parent's perceived program feasibility and acceptability, parent's evaluation of the quality of the services provided and whether they feel involved in their child intervention. Results showed a high global satisfaction, which is consistent with the literature, that reports that most of the few studies which evaluate parent's satisfaction tend to show high levels of satisfaction (Bradshaw, Steiner, Gengoux & Koegel, 2015). This global satisfaction is highly beneficial, since the negative impact of having a child with autism spectrum disorder is likely to have a reciprocal negative

effect on the child, creating a negative cycle that could mitigate the positive effects of intervention (Karst & Van Hecke, 2012).

The last objective was to evaluate the professional's satisfaction about teamwork and their self-efficacy. The results show a high global professional's satisfaction. To our knowledge the studies found in the literature that evaluate early intervention programs do not evaluate professional's satisfaction, so it was not possible to compare the results with other studies. Most team members are satisfied with the teamwork and show high levels of self-efficiency. Early intervention professionals working in a transdisciplinary team face many challenges (Cumming & Wong, 2012), so it is very beneficial that this team members show a high level of satisfaction. Besides, when people have a strong self-efficiency, they put more efforts in their activities (Bandura, 1997), these results are very promising.

This study had some limitations. It was not possible to evaluate the length of the program, because the participants entered in the program at different moments, so some children have had more intervention than others when this study began, which could influence the results. The intensity of the program varies accordingly which child's plan. In some cases, the child and the family needs changed and so the individual plan was modified, which changed the intensity of the intervention. Therefore, it was not possible to evaluate the accurate intensity of the program for each participant. The intensity could also affect the results. Future studies should try to have an accurate length and intensity of the program, considering all the changes that can occurred in these components during the study. It was also not considered if the differences in the children's development age and adaptive level at pre-test could be related to the results, such as if the children with better and worst results were the ones who showed less progress. Future studies should consider this aspect as well. Future studies should also evaluate the progress in the different items. It was also not possible to evaluate the existence of moderators variables, such as the existence of some kind of intervention before the child entered the program that could influence the results. Future studies should also try to consider this component. Another limitation is the fact that it was not possible to evaluate the actual dosage of intervention that the participants had, due to time constraints. Future studies should try to register not only the number of sessions the program proposes to each child, but also the actual number of sessions the child had, in order to understand if the results could be influence by this component. It was also not possible to evaluate the adherence (extent to

which the intervention complied with the proposed program), because it was not possible to observe every session of each child. For the same reason, it was also no possible to evaluate the children degree of engagement. These two components could also influence the results, so future studies could try to record the sessions to evaluate them. The quality of the services provided (how well the therapists master the program, the therapist know-how and the relationship between them and the children, etc.) was only evaluated accordingly with the parents and therapist's perspective through the questionnaires. Recognizing the difficulties involved in using a comparison group, this would be important to better understand whether the effects of the program. Finally, there was not a long-term outcome evaluation (at least one year post-intervention) and long-term outcomes are considered one important outcome in the evaluation of early intervention programs (Martin et al., 2018).

The evaluation of early intervention for autism spectrum disorder is very complex. There are a lot of components to evaluate regarding not only the children and parent's outcome, but also the components that consider how the intervention in implemented. Sometimes there are some variables (moderator variables) that could affect the children's progress that may be difficult to evaluate, such as sudden changes in the families routines. Future studies should try to avoid the limitations mentioned above, in order to better understand the effects of early intervention programs for children with ASD, but should always have in mind that this population presents a variety of different characteristics and is very sensible to even the smallest change in their routine, so the results must always be interpreted with caution.

## Conclusion

Autism Spectrum Disorder is a neuro-developmental disorder that involves difficulties in social communication and interaction and unusual patterns of behavior and interest. (Jagan & Sathiyaseelan, 2016). In Portugal, the prevalence is approximately 0.92% in the continent and 1,56% in Azores (Oliveira, 2005).

Literature suggests that early intervention programs have a positive effect on children with autism spectrum disorder. Regarding the social-communication outcomes, there are improvements in positive affect, eye contact, infant liveliness, expressive and receptive language and in behavior. Concerning the developmental outcomes, there are also gains in cognitive abilities and in adaptive behavior. However, some studies show significant differences between the experimental and the treatment-as-usual groups (who also receive intervention, but different from the experimental groups), while others do not. Respecting the diagnostic outcome, the studies show a reduction of autism symptoms severity, although they may not be significantly different from the treatment-as-usual group (Bradshaw, Steiner, Gengoux & Koegel, 2015; Rollins, Campbell, Hoffman & Self, 2016).

The comprehensive evaluation of an early intervention program should consider components such as: the empirical and theoretical basis of the program; the program length and intensity; the intervention goals and strategies; the parent involvement; the developmental, diagnostic and social-communication outcome of the children; the participant's degree of exposure to the intervention offered; the adherence of the program; the quality of the services provided; the participant's degree of engagement; and when possible, an accurate differentiation between two different programs and the presence of moderators variables (Bradshaw, Steiner, Gengoux & Koegel, 2015; Caron, Paquet & Bérubé, 2017). Since the negative family impact of having a child with autism spectrum disorder can hinder the effects of early intervention programs, it is important to evaluate not only the child outcome, but also the family outcome (Karst & Van Hecke, 2012). The team members satisfaction about teamwork and relationship between the team members and the supervision must also be evaluated, because professionals face many challenges when they are working in a transdisciplinary team (Cumming & Wong, 2012). Finally, it is known that low self-efficacy can have a negative impact in professionals' performance, which is why professional's self-efficiency should be evaluated (Bandura, 1997).

The IPIP program follows the IPI approach, which is based on three models with strong empirical evidence (DIR/ Greenspan Floortime approach, DIR and ABA). It also integrates information about the child development in general and three psychological theories (Theory of Mind, Executive Function and Central Coherence Theory), which emerged from intensive scientific research related to the specific aspects of the developmental of children with ASD (Coelho & Aguiar, 2013). This program also integrates the ESDM model, which also has strong empirical evidence. These four models and three psychological theories complement each other. By having strong theoretical models, this program has clear objectives and strategies to achieve them. The length of this program is the usual length for an early intervention program (children under six years) and its intensity varies according to each child plan.

Children were evaluated at two different moments, pre and post-test, that do not correspond to the beginning and finalization of the intervention, with the PEP-3. When the participants are set against the ASD continuum (by comparison with an autistic sample) by analyzing the progress on the adaptive level, most children (13) remain in the same category in the maladaptive behavior composite and in most subtests that compose this composite. That is, even if there were positive changes, these were not clinically significant, to the point of classifying children in a better adaptive level. However, literature indicates that early intervention programs tend to show a decrease of autism symptoms severity (Bradshaw, Steiner, Gengoux & Koegel, 2015; Rollins, Campbell, Hoffman & Self, 2016). In this study, few improvements in autistic symptoms were found. Only one child showed improvements, focused on the progress of cognitive verbal and pre-verbal, expressive language, receptive language, gross motor, visual-motor imitation and characteristic motor behaviors subtests and in the maladaptive behavior composite. Concerning the progress in their developmental age (by compared with a normative sample), most children showed positive gains, supporting previous studies that report that early intervention programs tend to show positive gains in children's development, such as in receptive and expressive language, cognitive abilities and more specific aspects such as eye contact and joint attention (Bradshaw, Steiner, Gengoux & Koegel, 2015; Rollins, Campbell, Hoffman & Self, 2016).

Parents showed a mean score of 4,65 (SD 0,45) for global satisfaction, which is consistent with the few studies found in the literature that evaluate parent's satisfaction. Having a child with ASD can have a great negative impact on the family, which can have

a reciprocal negative effect on the child, which creates a negative cycle that may reduce the effects of the intervention (Karst & Van Hecke, 2012). Therefore, it is highly positive that the parents showed such a high level of satisfaction about the program.

Given the limitations of this study, these results must be interpreted carefully. For future investigations, it would be beneficial to have a larger sample, a control/comparison group and a long-term (at least one year post-intervention) outcome. It should also be beneficial to consider the components that could not be evaluated in this study: the participants actual exposure to the program, their degree of engagement, the evaluation of the adherence (the extent to which the intervention complied with the proposed program), the evaluation of the quality of services provided, notably how well the caseworker masters the program, the characteristics related to the caseworker's know-how and the relationship between the caseworker and the program recipient and some moderators outcome, such as the differences in the intensity of the program according to each child plan, if the children had some kind of intervention before they entered the program, the existence of medical conditions that could intervene with the intervention and also the progress found in specific aspects, such as eye contact and joint attention.

In conclusion, this program is based on well-established theoretical models, clear objectives and strategies to achieve them. The results regarding the children were for the most part positive in the evaluation of the developmental age, since most children showed progress in the program. However, when the adaptive level was evaluated, most participants showed no significant progress. As there were no significant progress in the maladaptive behavior composite and the subtests that compose it, there were no significant effects of the program in the autism symptom severity. This is an aspect that the program should consider improving, although it is more difficult to find changes in the adaptive level than in the developmental age and the intervention in the autism symptom severity may not always be an objective of the children intervention. The results regarding the parent's satisfaction are highly promising, since they show that parents feel involved in their child's intervention and feel they have emotional support, which can improve the children outcome. Finally, the results regarding the team member's satisfaction are also highly promising, because most members showed to be satisfied with the team work and to have high self-efficiency, which can also improve the children outcome.

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## **Appendix**

**Appendix 1:** Pre and post-test results comparison of child 1

|                                  | Developmental age |           | Percentile Rank |           | Adaptative Level |           |
|----------------------------------|-------------------|-----------|-----------------|-----------|------------------|-----------|
|                                  | Pre-test          | Post-test | Pre-test        | Post-test | Pre-test         | Post-test |
| Cognitive verbal and pre-verbal  | 28 months         | 36 months | 52              | 69        | Moderate         | Moderate  |
| Expressive language              | 22 months         | 21 months | 43              | 43        | Moderate         | Moderate  |
| Receptive language               | 20 months         | 24 months | 48              | 63        | Moderate         | Moderate  |
| Fine motor                       | 29 months         | 39 months | 57              | 81        | Moderate         | Mild      |
| Gross motor                      | 32 months         | 30 months | 65              | 59        | Moderate         | Moderate  |
| Visual-motor imitation           | 29 months         | 31 months | 59              | 69        | Moderate         | Moderate  |
| Affective Expression             |                   |           | 81              | 81        | Mild             | Mild      |
| Social Reciprocity               |                   |           | 86              | 86        | Mild             | Mild      |
| Characteristic motor behaviors   |                   |           | 58              | 33        | Moderate         | Moderate  |
| Characteristic verbal behaviors  |                   |           | 15              | 23        | Severe           | Severe    |
| Communication composite          | 23 months         | 27 months | 36              | 55        | Moderate         | Moderate  |
| Motor composite                  | 30 months         | 33 months | 31              | 69        | Moderate         | Moderate  |
| Maladaptative behavior composite |                   |           | 46              | 41        | Moderate         | Moderate  |

**Appendix 2:** Pre and post-test results comparison of child 2

|                                  | Developmental age |           | Percentile Rank |           | Adaptative Level |           |
|----------------------------------|-------------------|-----------|-----------------|-----------|------------------|-----------|
|                                  | Pre-test          | Post-test | Pre-test        | Post-test | Pre-test         | Post-test |
| Cognitive verbal and pre-verbal  | 27 months         | 24 months | 52              | 36        | Moderate         | Moderate  |
| Expressive language              | 21 months         | 22 months | 43              | 52        | Moderate         | Moderate  |
| Receptive language               | 22 months         | 24 months | 54              | 72        | Moderate         | Moderate  |
| Fine motor                       | 24 months         | 22 months | 35              | 25        | Moderate         | Moderate  |
| Gross motor                      | 24 months         | 25 months | 33              | 29        | Moderate         | Moderate  |
| Visual-motor imitation           | 28 months         | 30 months | 50              | 65        | Moderate         | Moderate  |
| Affective Expression             |                   |           | 45              | 58        | Moderate         | Moderate  |
| Social Reciprocity               |                   |           | 59              | 59        | Moderate         | Moderate  |
| Characteristic motor behaviors   |                   |           | 8               | 12        | Severe           | Severe    |
| Characteristic verbal behaviors  |                   |           | 35              | 15        | Moderate         | Severe    |
| Communication composite          | 23 months         | 23 months | 40              | 36        | Moderate         | Moderate  |
| Motor composite                  | 25 months         | 26 months | 29              | 27        | Moderate         | Moderate  |
| Maladaptative behavior composite |                   |           | 19              | 19        | Severe           | Severe    |

**Appendix 3:** Pre and post-test results comparison of child 3

|                                  | Developmental age |           | Percentile Rank |           | Adaptative Level |           |
|----------------------------------|-------------------|-----------|-----------------|-----------|------------------|-----------|
|                                  | Pre-test          | Post-test | Pre-test        | Post-test | Pre-test         | Post-test |
| Cognitive verbal and pre-verbal  | 50 months         | 49 months | 86              | 64        | Mild             | Moderate  |
| Expressive language              | 24 months         | 34 months | 63              | 68        | Moderate         | Moderate  |
| Receptive language               | 33 months         | 40 months | 82              | 88        | Mild             | Mild      |
| Fine motor                       | 32 months         | 51 months | 55              | 86        | Moderate         | Mild      |
| Gross motor                      | 31 months         | 34 months | 47              | 48        | Moderate         | Moderate  |
| Visual-motor imitation           | 29 months         | 34 months | 50              | 50        | Moderate         | Moderate  |
| Affective Expression             |                   |           | 81              | 90        | Mild             | Adequate  |
| Social Reciprocity               |                   |           | 50              | 73        | Moderate         | Moderate  |
| Characteristic motor behaviors   |                   |           | 60              | 77        | Moderate         | Mild      |
| Characteristic verbal behaviors  |                   |           | 8               | 18        | Severe           | Severe    |
| Communication composite          | 36 months         | 41 months | 75              | 82        | Mild             | Mild      |
| Motor composite                  | 31 months         | 40 months | 46              | 75        | Moderate         | Mild      |
| Maladaptative behavior composite |                   |           | 31              | 63        | Moderate         | Moderate  |

**Appendix 4:** Pre and post-test results comparison of child 4

|                                  | Developmental age |           | Percentile Rank |           | Adaptative Level |           |
|----------------------------------|-------------------|-----------|-----------------|-----------|------------------|-----------|
|                                  | Pre-test          | Post-test | Pre-test        | Post-test | Pre-test         | Post-test |
| Cognitive verbal and pre-verbal  | 56 months         | 49 months | 93              | 64        | Adequate         | Moderate  |
| Expressive language              | 27 months         | 28 months | 75              | 45        | Mild             | Moderate  |
| Receptive language               | 44 months         | 44 months | 90              | 67        | Adequate         | Moderate  |
| Fine motor                       | 46 months         | 51 months | 90              | 86        | Adequate         | Mild      |
| Gross motor                      | 32 months         | 38 months | 47              | 77        | Mild             | Mild      |
| Visual-motor imitation           | 30 months         | 34 months | 65              | 50        | Moderate         | Moderate  |
| Affective Expression             |                   |           | 91              | 74        | Adequate         | Moderate  |
| Social Reciprocity               |                   |           | 93              | 73        | Adequate         | Moderate  |
| Characteristic motor behaviors   |                   |           | 83              | 61        | Mild             | Moderate  |
| Characteristic verbal behaviors  |                   |           | 15              | 41        | Severe           | Moderate  |
| Communication composite          | 42 months         | 40 months | 85              | 75        | Mild             | Mild      |
| Motor composite                  | 36 months         | 41 months | 64              | 81        | Moderate         | Mild      |
| Maladaptative behavior composite |                   |           | 75              | 57        | Mild             | Moderate  |

**Appendix 5:** Pre and post-test results comparison of child 5

|                                  | Developmental age |           | Percentile Rank |           | Adaptative Level |           |
|----------------------------------|-------------------|-----------|-----------------|-----------|------------------|-----------|
|                                  | Pre-test          | Post-test | Pre-test        | Post-test | Pre-test         | Post-test |
| Cognitive verbal and pre-verbal  | 29 months         | 34 months | 67              | 69        | Moderate         | Moderate  |
| Expressive language              | <12 months        | 21 months | 31              | 43        | Moderate         | Moderate  |
| Receptive language               | 19 months         | 21 months | 59              | 52        | Moderate         | Moderate  |
| Fine motor                       | 28 months         | 29 months | 52              | 57        | Moderate         | Moderate  |
| Gross motor                      | 30 months         | 30 months | 60              | 59        | Moderate         | Moderate  |
| Visual-motor imitation           | 27 months         | 22 months | 50              | 39        | Moderate         | Moderate  |
| Affective Expression             |                   |           | 58              | 81        | Moderate         | Mild      |
| Social Reciprocity               |                   |           | 73              | 86        | Moderate         | Mild      |
| Characteristic motor behaviors   |                   |           | 58              | 42        | Moderate         | Moderate  |
| Characteristic verbal behaviors  |                   |           | <4              | 15        | Severe           | Severe    |
| Communication composite          | 20 months         | 25 months | 36              | 46        | Moderate         | Moderate  |
| Motor composite                  | 28 months         | 27 months | 46              | 37        | Moderate         | Moderate  |
| Maladaptative behavior composite |                   |           | 27              | 31        | Moderate         | Moderate  |

**Appendix 6:** Pre and post-test results comparison of child 6

|                                  | Developmental age |           | Percentile Rank |           | Adaptative Level |           |
|----------------------------------|-------------------|-----------|-----------------|-----------|------------------|-----------|
|                                  | Pre-test          | Post-test | Pre-test        | Post-test | Pre-test         | Post-test |
| Cognitive verbal and pre-verbal  | 53 months         | 69 months | 97              | >99       | Adequate         | Adequate  |
| Expressive language              | 33 months         | 35 months | 90              | 85        | Adequate         | Mild      |
| Receptive language               | 33 months         | 52 months | 95              | 88        | Adequate         | Mild      |
| Fine motor                       | 42 months         | 42 months | 94              | 81        | Adequate         | Mild      |
| Gross motor                      | 31 months         | 36 months | 72              | 80        | Moderate         | Mild      |
| Visual-motor imitation           | 37 months         | 40 months | 98              | 89        | Adequate         | Mild      |
| Affective Expression             |                   |           | 91              | 91        | Adequate         | Adequate  |
| Social Reciprocity               |                   |           | 86              | 86        | Mild             | Mild      |
| Characteristic motor behaviors   |                   |           | 85              | 67        | Mild             | Moderate  |
| Characteristic verbal behaviors  |                   |           | 50              | 38        | Moderate         | Moderate  |
| Communication composite          | 40 months         | 52 months | >99             | 98        | Adequate         | Adequate  |
| Motor composite                  | 36 months         | 39 months | >99             | 92        | Adequate         | Adequate  |
| Maladaptative behavior composite |                   |           | 87              | 75        | Mild             | Mild      |

**Appendix 7:** Pre and post-test results comparison of child 7

|                                 | Developmental age |           | Percentile Rank |           | Adaptative Level |           |
|---------------------------------|-------------------|-----------|-----------------|-----------|------------------|-----------|
|                                 | Pre-test          | Post-test | Pre-test        | Post-test | Pre-test         | Post-test |
| Cognitive verbal and pre-verbal | 38 months         | 49 months | 87              | 96        | Mild             | Adequate  |
| Expressive language             | 24 months         | 29 months | 78              | 93        | Mild             | Adequate  |
| Receptive language              | 25 months         | 28 months | 80              | 89        | Mild             | Mild      |
| Fine motor                      | 29 months         | 33 months | 68              | 69        | Moderate         | Moderate  |
| Gross motor                     | 28 months         | 35 months | 59              | 60        | Moderate         | Moderate  |
| Visual-motor imitation          | 29 months         | 37 months | 59              | 92        | Moderate         | Adequate  |
| Affective Expression            |                   |           | 81              | 81        | Mild             | Mild      |
| Social Reciprocity              |                   |           | 73              | 59        | Moderate         | Moderate  |
| Characteristic motor behaviors  |                   |           | 39              | 44        | Moderate         | Moderate  |
| Characteristic verbal behaviors |                   |           | 25              | 15        | Moderate         | Severe    |
| Communication composite         | 29 months         | 35 months | 85              | 91        | Mild             | Adequate  |
| Motor composite                 | 29 months         | 33 months | 69              | 75        | Moderate         | Mild      |
| Maladaptive behavior composite  |                   |           | 52              | 46        | Moderate         | Moderate  |

**Appendix 8:** Pre and post-test results comparison of child 8

|                                  | Developmental age |           | Percentile Rank |           | Adaptative Level |           |
|----------------------------------|-------------------|-----------|-----------------|-----------|------------------|-----------|
|                                  | Pre-test          | Post-test | Pre-test        | Post-test | Pre-test         | Post-test |
| Cognitive verbal and pre-verbal  | 36 months         | 51 months | 87              | 98        | Mild             | Adequate  |
| Expressive language              | 28 months         | 37 months | 84              | 98        | Mild             | Adequate  |
| Receptive language               | 31 months         | 48 months | 89              | 98        | Mild             | Adequate  |
| Fine motor                       | 32 months         | 36 months | 79              | 85        | Mild             | Mild      |
| Gross motor                      | 29 months         | 33 months | 59              | 82        | Moderate         | Mild      |
| Visual-motor imitation           | 27 months         | 37 months | 47              | 92        | Moderate         | Adequate  |
| Affective Expression             |                   |           | 94              | 91        | Adequate         | Adequate  |
| Social Reciprocity               |                   |           | 86              | 86        | Mild             | Mild      |
| Characteristic motor behaviors   |                   |           | 53              | 98        | Moderate         | Adequate  |
| Characteristic verbal behaviors  |                   |           | 89              | 88        | Mild             | Mild      |
| Communication composite          | 32 months         | 45 months | 94              | 99        | Adequate         | Adequate  |
| Motor composite                  | 29 months         | 35 months | 69              | 92        | Moderate         | Adequate  |
| Maladaptative behavior composite |                   |           | 84              | 91        | Mild             | Adequate  |

**Appendix 9:** Pre and post-test results comparison of child 9

|                                  | Developmental age |           | Percentile Rank |           | Adaptative Level |           |
|----------------------------------|-------------------|-----------|-----------------|-----------|------------------|-----------|
|                                  | Pre-test          | Post-test | Pre-test        | Post-test | Pre-test         | Post-test |
| Cognitive verbal and pre-verbal  | 25 months         | 49 months | 55              | 56        | Moderate         | Moderate  |
| Expressive language              | 20 months         | 37 months | 48              | 62        | Moderate         | Moderate  |
| Receptive language               | 12 months         | 48 months | 36              | 35        | Moderate         | Moderate  |
| Fine motor                       | 26 months         | 46 months | 55              | 44        | Moderate         | Moderate  |
| Gross motor                      | 27 months         | 36 months | 47              | 60        | Moderate         | Moderate  |
| Visual-motor imitation           | 27 months         | 42 months | 47              | 40        | Moderate         | Moderate  |
| Affective Expression             |                   |           | 35              | 45        | Moderate         | Moderate  |
| Social Reciprocity               |                   |           | 59              | 59        | Moderate         | Moderate  |
| Characteristic motor behaviors   |                   |           | 19              | 12        | Severe           | Severe    |
| Characteristic verbal behaviors  |                   |           | 7               | <4        | Severe           | Severe    |
| Communication composite          | 19 months         | 45 months | 40              | 38        | Moderate         | Moderate  |
| Motor composite                  | 27 months         | 41 months | 51              | 40        | Moderate         | Moderate  |
| Maladaptative behavior composite |                   |           | 11              | 10        | Severe           | Severe    |

**Appendix 10:** Pre and post-test results comparison of child 10

|                                  | Developmental age |           | Percentile Rank |           | Adaptative Level |           |
|----------------------------------|-------------------|-----------|-----------------|-----------|------------------|-----------|
|                                  | Pre-test          | Post-test | Pre-test        | Post-test | Pre-test         | Post-test |
| Cognitive verbal and pre-verbal  | 49 months         | 65 months | 89              | 99        | Adequate         | Adequate  |
| Expressive language              | 37 months         | 61 months | 85              | 99        | Mild             | Adequate  |
| Receptive language               | 48 months         | 64 months | 88              | 96        | Mild             | Adequate  |
| Fine motor                       | 46 months         | 51 months | 93              | 93        | Adequate         | Adequate  |
| Gross motor                      | 36 months         | 34 months | 80              | 80        | Mild             | Mild      |
| Visual-motor imitation           | 42 months         | 42 months | 89              | 89        | Mild             | Mild      |
| Affective Expression             |                   |           | 81              | 91        | Mild             | Adequate  |
| Social Reciprocity               |                   |           | 93              | 98        | Adequate         | Adequate  |
| Characteristic motor behaviors   |                   |           | 58              | 88        | Moderate         | Mild      |
| Characteristic verbal behaviors  |                   |           | 46              | 73        | Moderate         | Moderate  |
| Communication composite          | 45 months         | 63 months | 94              | >99       | Adequate         | Adequate  |
| Motor composite                  | 41 months         | 42 months | 96              | 96        | Adequate         | Adequate  |
| Maladaptative behavior composite |                   |           | 75              | 94        | Mild             | Adequate  |

**Appendix 11:** Pre and post-test results comparison of child 11

|                                  | Developmental age |            | Percentile Rank |           | Adaptative Level |           |
|----------------------------------|-------------------|------------|-----------------|-----------|------------------|-----------|
|                                  | Pre-test          | Post-test  | Pre-test        | Post-test | Pre-test         | Post-test |
| Cognitive verbal and pre-verbal  | 33 months         | 15 months  | 97              | 16        | Adequate         | Severe    |
| Expressive language              | 27 months         | <12 months | 97              | 41        | Adequate         | Moderate  |
| Receptive language               | 22 months         | <12 months | 88              | 25        | Mild             | Moderate  |
| Fine motor                       | 23 months         | 22 months  | 38              | 24        | Moderate         | Severe    |
| Gross motor                      | 22 months         | 29 months  | 26              | 59        | Moderate         | Moderate  |
| Visual-motor imitation           | 26 months         | 18 months  | 57              | 13        | Moderate         | Severe    |
| Affective Expression             |                   |            | 58              | 58        | Moderate         | Moderate  |
| Social Reciprocity               |                   |            | 62              | 41        | Moderate         | Moderate  |
| Characteristic motor behaviors   |                   |            | 74              | 39        | Moderate         | Moderate  |
| Characteristic verbal behaviors  |                   |            | 79              | 7         | Mild             | Severe    |
| Communication composite          | 27 months         | 20 months  | 88              | 36        | Mild             | Moderate  |
| Motor composite                  | 24 months         | 23 months  | 43              | 31        | Moderate         | Moderate  |
| Maladaptative behavior composite |                   |            | 52              | 21        | Moderate         | Severe    |

**Appendix 12:** Pre and post-test results comparison of child 12

|                                  | Developmental age |           | Percentile Rank |           | Adaptative Level |           |
|----------------------------------|-------------------|-----------|-----------------|-----------|------------------|-----------|
|                                  | Pre-test          | Post-test | Pre-test        | Post-test | Pre-test         | Post-test |
| Cognitive verbal and pre-verbal  | 45 months         | 54 months | 92              | 89        | Adequate         | Mild      |
| Expressive language              | 26 months         | 35 months | 86              | 85        | Mild             | Mild      |
| Receptive language               | 31 months         | 56 months | 93              | 88        | Adequate         | Mild      |
| Fine motor                       | 39 months         | 46 months | 96              | 93        | Adequate         | Adequate  |
| Gross motor                      | 33 months         | 36 months | 82              | 80        | Mild             | Mild      |
| Visual-motor imitation           | 31 months         | 40 months | 71              | 89        | Moderate         | Mild      |
| Affective Expression             |                   |           | 81              | 97        | Mild             | Adequate  |
| Social Reciprocity               |                   |           | 86              | 98        | Mild             | Adequate  |
| Characteristic motor behaviors   |                   |           | 92              | 88        | Adequate         | Mild      |
| Characteristic verbal behaviors  |                   |           | 62              | 31        | Moderate         | Moderate  |
| Communication composite          | 34 months         | 73 months | 88              | 96        | Mild             | Adequate  |
| Motor composite                  | 33 months         | 41 months | 88              | 96        | Mild             | Adequate  |
| Maladaptative behavior composite |                   |           | 83              | 84        | Mild             | Mild      |

**Appendix 13:** Pre and post-test results comparison of child 13

|                                  | Developmental age |           | Percentile Rank |           | Adaptative Level |           |
|----------------------------------|-------------------|-----------|-----------------|-----------|------------------|-----------|
|                                  | Pre-test          | Post-test | Pre-test        | Post-test | Pre-test         | Post-test |
| Cognitive verbal and pre-verbal  | 42 months         | 36 months | 83              | 71        | Mild             | Moderate  |
| Expressive language              | 35 months         | 31 months | 85              | 81        | Mild             | Mild      |
| Receptive language               | 38 months         | 33 months | 81              | 82        | Mild             | Mild      |
| Fine motor                       | 33 months         | 30 months | 69              | 40        | Moderate         | Moderate  |
| Gross motor                      | 33 months         | 34 months | 65              | 69        | Moderate         | Moderate  |
| Visual-motor imitation           | 25 months         | 31 months | 46              | 65        | Moderate         | Moderate  |
| Affective Expression             |                   |           | 81              | 68        | Mild             | Moderate  |
| Social Reciprocity               |                   |           | 93              | 86        | Adequate         | Mild      |
| Characteristic motor behaviors   |                   |           | 58              | 47        | Moderate         | Moderate  |
| Characteristic verbal behaviors  |                   |           | 35              | 31        | Moderate         | Moderate  |
| Communication composite          | 38 months         | 33 months | 88              | 75        | Mild             | Mild      |
| Motor composite                  | 30 months         | 32 months | 51              | 51        | Moderate         | Moderate  |
| Maladaptative behavior composite |                   |           | 63              | 50        | Moderate         | Moderate  |

**Appendix 14:** Pre and post-test results comparison of child 14

|                                  | Developmental age |           | Percentile Rank |           | Adaptative Level |           |
|----------------------------------|-------------------|-----------|-----------------|-----------|------------------|-----------|
|                                  | Pre-test          | Post-test | Pre-test        | Post-test | Pre-test         | Post-test |
| Cognitive verbal and pre-verbal  | 27 months         | 32 months | 56              | 59        | Moderate         | Moderate  |
| Expressive language              | 24 months         | 26 months | 79              | 68        | Mild             | Moderate  |
| Receptive language               | 23 months         | 31 months | 76              | 81        | Mild             | Mild      |
| Fine motor                       | 28 months         | 30 months | 52              | 59        | Moderate         | Moderate  |
| Gross motor                      | 31 months         | 34 months | 70              | 80        | Moderate         | Mild      |
| Visual-motor imitation           | 22 months         | 30 months | 27              | 59        | Moderate         | Moderate  |
| Affective Expression             |                   |           | 45              | 35        | Moderate         | Moderate  |
| Social Reciprocity               |                   |           | 50              | 86        | Moderate         | Mild      |
| Characteristic motor behaviors   |                   |           | 14              | 42        | Severe           | Moderate  |
| Characteristic verbal behaviors  |                   |           | 15              | 15        | Severe           | Severe    |
| Communication composite          | 25 months         | 30 months | 59              | 71        | Moderate         | Moderate  |
| Motor composite                  | 41 months         | 31 months | 46              | 64        | Moderate         | Moderate  |
| Maladaptative behavior composite |                   |           | 68              | 21        | Moderate         | Severe    |

**Appendix 15:** Pre and post-test results comparison of child 15

|                                  | Developmental age |            | Percentile Rank |           | Adaptative Level |           |
|----------------------------------|-------------------|------------|-----------------|-----------|------------------|-----------|
|                                  | Pre-test          | Post-test  | Pre-test        | Post-test | Pre-test         | Post-test |
| Cognitive verbal and pre-verbal  | 29 months         | 32 months  | 88              | 68        | Mild             | Moderate  |
| Expressive language              | <12 months        | <12 months | 31              | 41        | Moderate         | Moderate  |
| Receptive language               | 19 months         | 23 months  | 68              | 72        | Moderate         | Moderate  |
| Fine motor                       | 31 months         | 33 months  | 85              | 79        | Mild             | Mild      |
| Gross motor                      | 25 months         | 28 months  | 50              | 59        | Moderate         | Moderate  |
| Visual-motor imitation           | 28 months         | 31 months  | 81              | 83        | Mild             | Mild      |
| Affective Expression             |                   |            | 85              | 68        | Mild             | Moderate  |
| Social Reciprocity               |                   |            | 83              | 86        | Mild             | Mild      |
| Characteristic motor behaviors   |                   |            | 48              | 53        | Moderate         | Moderate  |
| Characteristic verbal behaviors  |                   |            | 7               | 4         | Severe           | Severe    |
| Communication composite          | 20 months         | 22 months  | 50              | 59        | Moderate         | Moderate  |
| Motor composite                  | 28 months         | 31 months  | 75              | 81        | Mild             | Mild      |
| Maladaptative behavior composite |                   |            | 46              | 50        | Moderate         | Moderate  |

## Appendix 16: Informed consented form for the parents

### Declaração de consentimento informado

No âmbito do Mestrado Integrado em Psicologia, da Faculdade de Psicologia e de Ciências da Educação, está a ser desenvolvido um estudo científico pela investigadora Maria Constança Brandão Nascimento Pinto, sob orientação da Doutora Marina Serra Lemos.

O estudo pretende compreender os efeitos dos programas de intervenção precoce no desenvolvimento das crianças. Para isso, venho solicitar a sua autorização para ter acesso aos resultados das avaliações que o seu filho já realizou ou venha a realizar no próximo ano letivo no âmbito do programa em que está inserido, de modo a poder observar a evolução do seu desenvolvimento. Por fim, peço também que responda a um questionário sobre a sua opinião e satisfação relativamente a este programa cuja duração será de aproximadamente 10 minutos.

A participação no estudo é voluntária, pode ser interrompida a qualquer momento e todas as informações fornecidas serão estritamente confidenciais e para uso exclusivo desta investigação.

Caso tenha alguma dúvida, poderá contactar-me através do email: [constanca.brandao.9@gmail.com](mailto:constanca.brandao.9@gmail.com).

No caso de estar interessado(a) em participar nesta investigação, por favor preencha os espaços em baixo:

Data \_\_\_\_\_

Nome da Criança \_\_\_\_\_

Assinatura da mãe/pai \_\_\_\_\_

## **Appendix 17: Informed consented form for the team members**

### **Declaração de consentimento informado**

No âmbito do Mestrado Integrado em Psicologia, da Faculdade de Psicologia e de Ciências da Educação, está a ser desenvolvido um estudo científico pela investigadora Maria Constança Brandão Nascimento Pinto, sob orientação da Doutora Marina Serra Lemos.

O estudo pretende compreender os efeitos dos programas de intervenção precoce no desenvolvimento das crianças. Venho solicitar a sua resposta a um questionário sobre o funcionamento da equipa transdisciplinar responsável por este programa, na qual está inserido/a, cuja duração será de aproximadamente 10 minutos.

A participação no estudo é voluntária, pode ser interrompida a qualquer momento e todas as informações fornecidas serão estritamente confidenciais e para uso exclusivo desta investigação.

Caso tenha alguma dúvida, poderá contactar-me através do email: [constanca.brandao.9@gmail.com](mailto:constanca.brandao.9@gmail.com).

No caso de estar interessado(a) em participar nesta investigação, por favor preencha os espaços em baixo:

Data \_\_\_\_\_

Assinatura \_\_\_\_\_

**Appendix 18:** Parent's questionnaire

**Género:** Feminino\_\_\_ Masculino\_\_\_

**Idade:**

**Área de residência:** Urbana\_\_\_ Rural\_\_\_ Suburbana\_\_\_

**N<sup>a</sup> de filhos:**\_\_\_\_\_

**Tendo em conta a intervenção que o seu filho recebeu nos últimos seis meses no programa de intervenção precoce em que está inserido, indique o seu grau de satisfação, numa escala de 1 (nada satisfeito) a 5 (totalmente satisfeito), relativamente a cada um dos seguintes aspetos.**

|                                                                                                       | <b>1</b> | <b>2</b> | <b>3</b> | <b>4</b> | <b>5</b> |  | <b>Não se aplica</b> |
|-------------------------------------------------------------------------------------------------------|----------|----------|----------|----------|----------|--|----------------------|
| Estou satisfeito com o progresso que o meu filho/a tem tido com este programa de intervenção precoce. |          |          |          |          |          |  |                      |
| Este programa vai ao encontro das minhas expectativas iniciais.                                       |          |          |          |          |          |  |                      |
| Este programa vai ao encontro das minhas necessidades.                                                |          |          |          |          |          |  |                      |
| Este programa vai o encontro das necessidades do meu filho/a.                                         |          |          |          |          |          |  |                      |
| Estou satisfeito com a variedade de especialidades que este programa apresenta.                       |          |          |          |          |          |  |                      |

|                                                                                                              | 1 | 2 | 3 | 4 | 5 |  | Não se aplica |
|--------------------------------------------------------------------------------------------------------------|---|---|---|---|---|--|---------------|
| Sinto que os terapeutas têm em conta a minha opinião relativamente à intervenção do meu filho/a.             |   |   |   |   |   |  |               |
| Sinto que os terapeutas me envolvem na intervenção que o meu filho/a recebe.                                 |   |   |   |   |   |  |               |
| Sinto que há uma boa colaboração entre mim e os terapeutas que acompanham o meu filho/a.                     |   |   |   |   |   |  |               |
| Sinto que a minha privacidade é respeitada.                                                                  |   |   |   |   |   |  |               |
| Sinto que os terapeutas me ajudam a melhorar a minha capacidade de controlar o comportamento do meu filho/a. |   |   |   |   |   |  |               |
| Sinto que os terapeutas me ajudam a ser mais capaz de responder às necessidades do meu filho/a.              |   |   |   |   |   |  |               |
| Sinto que os terapeutas me ajudam a reduzir o stress que sinto.                                              |   |   |   |   |   |  |               |
| Sinto que os terapeutas me dão apoio emocional.                                                              |   |   |   |   |   |  |               |

|                                                                                                                                      | 1 | 2 | 3 | 4 | 5 |  | Não se aplica |
|--------------------------------------------------------------------------------------------------------------------------------------|---|---|---|---|---|--|---------------|
| Sinto que com a ajuda dos terapeutas, estou menos cansado/a.                                                                         |   |   |   |   |   |  |               |
| Sinto que os terapeutas me ajudam a ter uma melhor relação com o meu filho/a.                                                        |   |   |   |   |   |  |               |
| Sinto que com a ajuda dos terapeutas a minha relação conjugal está a melhorar.                                                       |   |   |   |   |   |  |               |
| Sinto que com a ajuda dos terapeutas a minha família está a relacionar-se melhor.                                                    |   |   |   |   |   |  |               |
| Sinto que os terapeutas ajudam a que os meus filhos tenham uma melhor relação entre si.                                              |   |   |   |   |   |  |               |
| Sinto que os terapeutas, para além de apoiarem o/a filho, apoiam o seu irmão/ã quando este necessita.                                |   |   |   |   |   |  |               |
| Sinto que com a ajuda dos terapeutas, tenho vindo a ter bons momentos com a minha família.                                           |   |   |   |   |   |  |               |
| Sinto que com a ajuda dos terapeutas, consigo gerir melhor o meu tempo, pelo que consigo participar em atividades que me dão prazer. |   |   |   |   |   |  |               |
| Estou satisfeito com os custos deste programa de intervenção precoce.                                                                |   |   |   |   |   |  |               |

Gostaria que o programa incorporasse mais alguma especialidade?;

Se sim, qual?;

Gostaria que o seu filho/a tivesse mais horas de alguma especialidade?

Se sim, qual?;

**Tendo em conta cada a especialidade que o seu filho/a frequenta, indique o seu grau de satisfação, numa escala de 1 (nada satisfeito) a 5 (totalmente satisfeito), relativamente a cada um dos seguintes aspetos:**

| <b><u>Psicologia</u></b>                                                                                  | <b>1</b> | <b>2</b> | <b>3</b> | <b>4</b> | <b>5</b> |  | <b>Não se aplica</b> |
|-----------------------------------------------------------------------------------------------------------|----------|----------|----------|----------|----------|--|----------------------|
| Estou satisfeito com o número de sessões semanais de psicologia que o meu filho/a tem.                    |          |          |          |          |          |  |                      |
| Estou satisfeito com o empenho, entusiasmo e responsabilidade que o psicólogo/a do meu filho/a demonstra. |          |          |          |          |          |  |                      |
| Estou satisfeito com o conhecimento que o psicólogo/a demonstra sobre a condição do meu filho/a.          |          |          |          |          |          |  |                      |
| Sinto que o psicólogo/a compreende as dificuldades do meu filho/a.                                        |          |          |          |          |          |  |                      |

|                                                                                                           | 1 | 2 | 3 | 4 | 5 |  | Não se aplica |
|-----------------------------------------------------------------------------------------------------------|---|---|---|---|---|--|---------------|
| Sinto que o psicólogo/a é capaz de lidar com o comportamento do meu filho/a e modificá-lo quando preciso. |   |   |   |   |   |  |               |

| <b><u>Terapia da Fala</u></b>                                                                                   | 1 | 2 | 3 | 4 | 5 |  | Não se aplica |
|-----------------------------------------------------------------------------------------------------------------|---|---|---|---|---|--|---------------|
| Estou satisfeito com o número de sessões semanais de terapia da fala que o meu filho/a tem.                     |   |   |   |   |   |  |               |
| Estou satisfeito com o empenho, entusiasmo e responsabilidade que o terapeuta da fala do meu filho/a demonstra. |   |   |   |   |   |  |               |
| Estou satisfeito com o conhecimento que o terapeuta da fala demonstra sobre a condição do meu filho/a.          |   |   |   |   |   |  |               |

|                                                                                                                 | <b>1</b> | <b>2</b> | <b>3</b> | <b>4</b> | <b>5</b> |  | <b>Não se aplica</b> |
|-----------------------------------------------------------------------------------------------------------------|----------|----------|----------|----------|----------|--|----------------------|
| Sinto que o terapeuta da fala compreende as dificuldades do meu filho/a.                                        |          |          |          |          |          |  |                      |
| Sinto que o terapeuta da fala é capaz de lidar com o comportamento do meu filho/a e modificá-lo quando preciso. |          |          |          |          |          |  |                      |

| <b><u>Terapia da Ocupacional</u></b>                                                                                | <b>1</b> | <b>2</b> | <b>3</b> | <b>4</b> | <b>5</b> |  | <b>Não se aplica</b> |
|---------------------------------------------------------------------------------------------------------------------|----------|----------|----------|----------|----------|--|----------------------|
| Estou satisfeito com o número de sessões semanais de terapia ocupacional que o meu filho/a tem.                     |          |          |          |          |          |  |                      |
| Estou satisfeito com o empenho, entusiasmo e responsabilidade que o terapeuta ocupacional do meu filho/a demonstra. |          |          |          |          |          |  |                      |
| Estou satisfeito com o conhecimento que o terapeuta ocupacional demonstra sobre a condição do meu filho/a.          |          |          |          |          |          |  |                      |
| Sinto que o terapeuta ocupacional compreende as dificuldades do meu filho/a.                                        |          |          |          |          |          |  |                      |
| Sinto que o terapeuta ocupacional é capaz de lidar com o comportamento do meu filho/a e modificá-lo quando preciso. |          |          |          |          |          |  |                      |

| <b><u>Musicoterapia</u></b>                                                                                   | <b>1</b> | <b>2</b> | <b>3</b> | <b>4</b> | <b>5</b> |  | <b>Não se aplica</b> |
|---------------------------------------------------------------------------------------------------------------|----------|----------|----------|----------|----------|--|----------------------|
| Estou satisfeito com o número de sessões semanais de musicoterapia que o meu filho/a tem.                     |          |          |          |          |          |  |                      |
| Estou satisfeito com o empenho, entusiasmo e responsabilidade que o musicoterapeuta do meu filho/a demonstra. |          |          |          |          |          |  |                      |
| Estou satisfeito com o conhecimento que o musicoterapeuta demonstra sobre a condição do meu filho/a.          |          |          |          |          |          |  |                      |
| Sinto que o musicoterapeuta compreende as dificuldades do meu filho/a.                                        |          |          |          |          |          |  |                      |
| Sinto que o musicoterapeuta é capaz de lidar com o comportamento do meu filho/a e modificá-lo quando preciso. |          |          |          |          |          |  |                      |

| <b><u>Contexto no infantário e/ou em casa</u></b>                                                                                                                           | <b>1</b> | <b>2</b> | <b>3</b> | <b>4</b> | <b>5</b> |  | <b>Não se aplica</b> |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|----------|----------|----------|----------|--|----------------------|
| Estou satisfeito com o número de horas de intervenção que o meu filho/a de contexto no infantário.                                                                          |          |          |          |          |          |  |                      |
| Estou satisfeito com o número de horas de intervenção que o meu filho/a de contexto em casa.                                                                                |          |          |          |          |          |  |                      |
| Estou satisfeito com o empenho, entusiasmo e responsabilidade demonstrada pelo estagiário de psicologia que acompanha o meu filho nos contextos no infantário e/ou em casa. |          |          |          |          |          |  |                      |
| Estou satisfeito com o conhecimento que o estagiário/a de psicologia que realiza os contextos no infantário e/ou em casa tem sobre a condição do meu filho/a.               |          |          |          |          |          |  |                      |

| <b><u>Contexto no infantário e/ou em casa</u></b>                                                                                                                            | <b>1</b> | <b>2</b> | <b>3</b> | <b>4</b> | <b>5</b> |  | <b>Não se aplica</b> |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|----------|----------|----------|----------|--|----------------------|
| Sinto que o estagiário/a de psicologia que realiza os contextos no infantário e/ou em casa compreende as dificuldades do meu filho/a.                                        |          |          |          |          |          |  |                      |
| Sinto que o estagiário/a de psicologia que realiza os contextos no infantário e/ou em casa é capaz de lidar com o comportamento do meu filho/a e modificá-lo quando preciso. |          |          |          |          |          |  |                      |

| <b><u>Terapia em Par</u></b>                                                                                                                 | <b>1</b> | <b>2</b> | <b>3</b> | <b>4</b> | <b>5</b> |  | <b>Não se aplica</b> |
|----------------------------------------------------------------------------------------------------------------------------------------------|----------|----------|----------|----------|----------|--|----------------------|
| Estou satisfeito com o número de sessões semanais de terapia em par que o meu filho/a tem.                                                   |          |          |          |          |          |  |                      |
| Estou satisfeito com o empenho, entusiasmo e responsabilidade que os terapeutas que realizam as sessões de par do meu filho/a demonstram.    |          |          |          |          |          |  |                      |
| Estou satisfeito com o conhecimento que os terapeutas que realizam as sessões de par demonstram sobre a condição do meu filho/a.             |          |          |          |          |          |  |                      |
| Sinto que os terapeutas que realizam as sessões de par compreendem as dificuldades do meu filho/a.                                           |          |          |          |          |          |  |                      |
| Sinto que os terapeutas que realizam as sessões de par são capazes de lidar com o comportamento do meu filho/a e modificá-lo quando preciso. |          |          |          |          |          |  |                      |

## Appendix 19: Professional's questionnaire

**Terapeuta:** \_\_\_\_\_

**Estagiário/a:** \_\_\_\_\_

**Tendo em conta os últimos seis meses e o trabalho em equipa realizado no âmbito do programa de intervenção precoce em que trabalha, por favor indique o seu grau de concordância, numa escala de 1 (nada de acordo) a 5 (totalmente de acordo), relativamente às seguintes afirmações:**

|                                                                              | 1 | 2 | 3 | 4 | 5 |
|------------------------------------------------------------------------------|---|---|---|---|---|
| 1. Sinto-me capaz de trabalhar em equipa.                                    |   |   |   |   |   |
| 2. Sinto que esta equipa é capaz de fazer um bom trabalho em conjunto.       |   |   |   |   |   |
| 3. Sinto que existe um bom ambiente entre a equipa.                          |   |   |   |   |   |
| 4. Sinto que existe uma boa relação entre a equipa e a supervisão.           |   |   |   |   |   |
| 5. Sinto que as minhas opiniões e sugestões sobre os casos são consideradas. |   |   |   |   |   |
| 6. Sinto-me capaz de dar opiniões e sugestões sobre os casos.                |   |   |   |   |   |
| 7. Sinto-me capaz de ajudar os meus colegas a melhorarem o seu trabalho.     |   |   |   |   |   |

|                                                              |  |  |  |  |  |
|--------------------------------------------------------------|--|--|--|--|--|
| 8. Sinto-me capaz de ajudar a melhorar o trabalho em equipa. |  |  |  |  |  |
|--------------------------------------------------------------|--|--|--|--|--|

|                                                                                                                                               | 1 | 2 | 3 | 4 | 5 |
|-----------------------------------------------------------------------------------------------------------------------------------------------|---|---|---|---|---|
| 9. Sinto-me capaz de ajudar na colaboração entre os membros da equipa e a supervisão.                                                         |   |   |   |   |   |
| 10. Quando existem problemas relativamente ao trabalho em equipa, sinto-me capaz de os ultrapassar a maior parte das vezes.                   |   |   |   |   |   |
| 11. Quando surge um problema relativamente ao meu trabalho com uma criança, sinto que posso pedir ajuda aos membros da equipa e à supervisão. |   |   |   |   |   |
| 12. Quando surge um problema com os pais de uma criança, sinto que posso pedir ajuda aos membros da equipa e à supervisão.                    |   |   |   |   |   |
| 13. Sinto-me capaz de transmitir aos colegas estratégias para trabalhar com as crianças.                                                      |   |   |   |   |   |

|                                                                                                                    |  |  |  |  |  |
|--------------------------------------------------------------------------------------------------------------------|--|--|--|--|--|
| 14. Sinto-me capaz de por em prática as estratégias que os meus colegas me sugerem para trabalhar com as crianças. |  |  |  |  |  |
|--------------------------------------------------------------------------------------------------------------------|--|--|--|--|--|

|                                                                                                        | 1 | 2 | 3 | 4 | 5 |
|--------------------------------------------------------------------------------------------------------|---|---|---|---|---|
| 15. Sinto que tenho acesso a todos os materiais e equipamentos que necessito para uma boa intervenção. |   |   |   |   |   |
| 16. Sinto que sou capaz de realizar um bom trabalho e cumprir os objetivos propostos.                  |   |   |   |   |   |
| 17. Penso que os métodos que este programa utiliza são eficazes no desenvolvimento da criança.         |   |   |   |   |   |
| 18. Penso que este programa tem objetivos de intervenção pertinentes.                                  |   |   |   |   |   |
| 19. Sinto-me satisfeito/a com este programa de intervenção precoce.                                    |   |   |   |   |   |
| 20. Sinto que os pais têm em conta a minha opinião e sugestões.                                        |   |   |   |   |   |
| 21. Sinto-me capaz de expor a minha opinião e de dar sugestões aos pais.                               |   |   |   |   |   |

|                                                          |  |  |  |  |  |
|----------------------------------------------------------|--|--|--|--|--|
| 22. Sinto-me capaz de criar uma boa relação com os pais. |  |  |  |  |  |
|----------------------------------------------------------|--|--|--|--|--|

|                                                                                                                      | 1 | 2 | 3 | 4 | 5 |
|----------------------------------------------------------------------------------------------------------------------|---|---|---|---|---|
| 23. Sinto-me capaz de envolver os pais na intervenção dos filhos.                                                    |   |   |   |   |   |
| 24. Sinto-me capaz de ajudar os pais a lidar melhor com os filhos.                                                   |   |   |   |   |   |
| 25. Sinto-me capaz de por os pais confortáveis em assistir às sessões.                                               |   |   |   |   |   |
| 26. Quando surge algum problema no relacionamento com os pais, sinto-me capaz de o resolver a maior parte das vezes. |   |   |   |   |   |
| 27. Sinto-me capaz de criar uma boa relação com as crianças, mesmo com as mais difíceis.                             |   |   |   |   |   |
| 28. Sinto-me capaz de ajudar uma criança, mesmo quando esta não tem um bom apoio em casa.                            |   |   |   |   |   |
| 29. Sinto-me capaz de motivar as crianças que acompanho ao longo das atividades.                                     |   |   |   |   |   |

|                                                                                                                                | <b>1</b> | <b>2</b> | <b>3</b> | <b>4</b> | <b>5</b> |
|--------------------------------------------------------------------------------------------------------------------------------|----------|----------|----------|----------|----------|
| 30. Sinto-me capaz de controlar os comportamentos disruptivos das crianças que acompanho.                                      |          |          |          |          |          |
| 31. Sinto-me capaz de prevenir problemas de comportamentos das crianças que acompanho.                                         |          |          |          |          |          |
| 32. Sinto-me capaz de fazer com que as crianças gostem de trabalhar comigo.                                                    |          |          |          |          |          |
| 33. Quando é notório que a criança não está a responder à intervenção como esperado, sinto-me capaz de encontrar alternativas. |          |          |          |          |          |
| 34. Sinto que tenho uma boa formação para trabalhar com as crianças que acompanho.                                             |          |          |          |          |          |

**Appendix 20:** Parent's satisfaction with the variety of the program components

**Gostaria que o programa incorporasse mais alguma especialidade**

|        |       | Frequência | Porcentagem | Porcentagem válida | Porcentagem acumulativa |
|--------|-------|------------|-------------|--------------------|-------------------------|
| Válido | não   | 15         | 93,8        | 93,8               | 93,8                    |
|        | sim   | 1          | 6,3         | 6,3                | 100,0                   |
|        | Total | 16         | 100,0       | 100,0              |                         |

**Se\_sim\_qual**

|        |                                   | Frequência | Porcentagem | Porcentagem válida | Porcentagem acumulativa |
|--------|-----------------------------------|------------|-------------|--------------------|-------------------------|
| Válido | Intervenção Assistida por Animais | 1          | 6,3         | 100,0              | 100,0                   |
| Omisso | 9                                 | 15         | 93,8        |                    |                         |
| Total  |                                   | 16         | 100,0       |                    |                         |

**Appendix 21:** Parent's satisfaction with the number of hours in program components

**Gostaria que o seu filho tivesse mais horas de alguma especialidade**

|        |       | Frequência | Porcentagem | Porcentagem válida | Porcentagem acumulativa |
|--------|-------|------------|-------------|--------------------|-------------------------|
| Válido | não   | 6          | 37,5        | 37,5               | 37,5                    |
|        | sim   | 10         | 62,5        | 62,5               | 100,0                   |
|        | Total | 16         | 100,0       | 100,0              |                         |

**Se\_sim\_qual\_2**

|        |                     | Frequência | Porcentagem | Porcentagem válida | Porcentagem acumulativa |
|--------|---------------------|------------|-------------|--------------------|-------------------------|
| Válido | terapia ocupacional | 3          | 18,8        | 33,3               | 33,3                    |
|        | terapia da fala     | 3          | 18,8        | 33,3               | 66,7                    |
|        | musicoterapia       | 1          | 6,3         | 11,1               | 77,8                    |
|        | contexto            | 2          | 12,5        | 22,2               | 100,0                   |
|        | Total               | 9          | 56,3        | 100,0              |                         |
| Omisso | 9                   | 7          | 43,8        |                    |                         |
| Total  |                     | 16         | 100,0       |                    |                         |