millenium

AVALIAÇÃO DO DESENVOLVIMENTO INFANTIL DE CRIANÇAS COM SUSPEITA DE PERTURBAÇÃO DO ESPECTRO AUTISTA
EVALUATION OF CHILD DEVELOPMENT OF CHILDREN WITH SUSPECTED AUTISTIC SPECTRUM DISORDER
EVALUACIÓN DEL DESARROLLO INFANTIL DE NIÑOS CON SOSPECHA DE TRASTORNOS DEL ESPECTRO AUTISTA

Aline Bernardes de Souza[1] iD *https://orcid.org/0000-0001-8966-3238*
Luzia de Miranda Meurer[1] iD *https://orcid.org/0000-0003-0414-1866*
Raquel Cymrot[2] iD *https://orcid.org/0000-0001-9874-4507*

[1] Brusque University Center - Unifebe, Brusque, Brazil
[2] Mackenzie Presbyterian University, São Paulo, Brazil

Aline Bernardes de Souza - alinebernardessouza@yahoo.com.br | Luzia de Miranda Meurer - luziameurer@gmail.com | Raquel Cymrot - cymrot@uol.com.br

Corresponding Author
Aline Bernardes de Souza
Rua Dorval Luz, 123 - Santa Terezinha
88352-400 Brusque - Brasil
alinebernardessouza@yahoo.com.br

RESUMO

Introdução: O desenvolvimento infantil é um processo contínuo de aquisição e aprimoramento de habilidades globais que tem seus principais marcos nos três primeiros anos de vida do indivíduo. A Perturbação do Espectro Autista (PEA) caracteriza-se como uma alteração no neurodesenvolvimento que envolve déficits persistentes na comunicação e na interação social além de movimentos estereotipados que podem ser percebidos nos anos iniciais da criança antes mesmo do diagnóstico definido.
Objetivo: Analisar o desenvolvimento global de crianças com risco para PEA nos seus 5 domínios: cognição, comunicação (expressiva e receptiva), motricidade (fina e grossa), comportamento adaptativo e socioemocional e, correlacionar com os sinais indicativos de PEA.
Métodos: Foram avaliadas 9 crianças do sexo masculino com idades entre 24 e 41 meses com suspeita do PEA, pelo Protea-R (Bosa &Salles, 2018), utilizando as escalas de desenvolvimento infantil Bayley (Bayley, 2018).
Resultados: De modo geral, houve comprometimento nos 5 comportamentos mensurados com maior intensidade nas crianças com Risco para PEA do que as com Risco Relativo para PEA. As habilidades cognitivas, linguísticas e socioemocionais se demonstraram mais prejudicadas nestes.
Conclusão: Este estudo possibilitou reflexões à cerca do desenvolvimento integral de crianças com suspeita dePEA mesmo não sendo possível determinar um padrão de desenvolvimento global nestes indivíduos.

Palavras-chave: transtorno do espectro autista; autismo; avaliação do desenvolvimento neuropsicológico; desenvolvimento infantil

ABSTRACT

Introduction: Child development is a continuous process of acquisition and improvement of global skills that has its main milestones in the first three years of an individual's life. Autism Spectrum Disorder (ASD) is characterized as an alteration in neurodevelopment that involves persistent deficits in communication and social interaction, in addition to stereotyped movements that can be noticed in the child's early years even before the diagnosis is defined.
Objective: Analyze the overall development of children at risk for ASD in its 5 domains: cognition, communication (expressive and receptive), motor skills (fine and gross), adaptive and socio-emotional behavior, and to correlate with the indicative of ASD signs.
Methods: Nine male children aged between 24 and 41 months with suspected ASD were evaluated by Protea-R (Bosa &Salles, 2018) using the Bayley child development scales (Bayley, 2018).
Results: Overall, there was impairment in the 5 behaviors measured with greater intensity in children at Risk for ASD than those at Relative Risk for ASD. Cognitive, linguistic and social-emotional skills were more impaired in these.
Conclusions: This study allowed reflections on the integral development of children with suspected ASD even though it was not possible to determine a pattern of global development in these individuals.

Keywords: autistic spectrum disorder; autistic disorder; neuropsychological tests; child development

RESUMEN

Introducción: El desarrollo infantil es un proceso continuo de adquisición y mejora de habilidades globales que tiene sus principales hitos en los primeros tres años de la vida de un individuo. El Trastorno del Espectro Autista (TEA) se caracteriza por una alteración del neurodesarrollo que implica déficits persistentes en la comunicación e interacción social, además de movimientos estereotipados que se pueden notar en los primeros años del niño incluso antes de que se defina el diagnóstico.
Objetivos: Este estudio buscó analizar el desarrollo global de niños en riesgo de TEA en sus 5 dominios: cognición, comunicación (expresiva y receptiva), habilidades motoras (fina y gruesa), comportamiento adaptativo y socioemocional, y correlacionar con el indicativo. de los signos de TEA.
Métodos: Nueve niños varones de entre 24 y 41 meses con sospecha de TEA fueron evaluados por Protea-R (Bosa &Salles, 2018) utilizando las escalas de desarrollo infantil de Bayley (Bayley, 2018).
Resultados: En general, hubo deterioro en los 5 comportamientos medidos con mayor intensidad en los niños con riesgo de TEA que en aquellos con riesgo relativo de TEA. Las habilidades cognitivas, lingüísticas y socioemocionales se vieron más afectadas en estos.
Conclusion: Este estudio permitió reflexionar sobre el desarrollo integral de los niños con sospecha de TEA aunque no fue posible determinar un patrón de desarrollo global en estos individuos.

Palabras clave: trastorno del espectro autista; trastorno autista; pruebas neuropsicológicas; desarrollo infantil

m₁₆

INTRODUCTION

Child development is a continuous process of acquisition and improvement of motor, cognitive and social skills that are interrelated to promote the child's overall development. It is from this process that children acquire various human capabilities that help them interact with the environment in which they live, such as improving human communication, in a receptive and expressive way (Amorim et al., 2009; Maria-Mengel & Linhares, 2007) .

The first three years of an individual's life are considered the main periods of learning and improving human skills and behavior. It is during this phase that the main milestones of an individual's global development take place (Maria-Mengel & Linhares, 2007).

Biological, environmental, economic and social factors can compromise this development and trigger neuropsychomotor alterations, delays in the acquisition of skills and/or behaviors, functional deficits and impairments in school learning.

Among the main disorders of child development is the Autistic Spectrum Disorder (ASD), which is characterized by persistent deficits in reciprocal social communication and social interaction. These can be observed in the difficulties of interacting with other people, in the reduction in the sharing of interests, emotions and affection with others. Deficits in non-verbal communicative behavior are noted in the lack of facial expressions, difficulty in repeating and understanding gestures, in establishing a conversation, in maintaining and understanding a relationship, resulting in behavioral maladjustment in certain social contexts. As well as the difficulty of participating in games that require the exercise of imagination and lack of interest in peers. In addition to these commitments, it is also noted the presence of restricted and repetitive patterns of behavior, interests or activities (APA, 2014).

The first signs indicative of ASD, such as deficits in shared attention, can be observed since early childhood (APA,2014), with greater intensity at 12 months of age and more regularly between 18 to 24 months of age (Ozonoff et al., 2010).

Parents are often the main observers of these impairments. Usually, they notice a lack of interest by the child in social interactions, low socio-emotional reciprocity and delays in verbal and non-verbal communication (Bosa &Salles, 2018).

Sensory hyper- or hypo-reactivity is also often present in these children, as well as a high threshold for physical pain and exaggerated fears of stimuli, usually considered non-threatening. Difficulty in sensory processing tends to generate neurofunctional overload and compromise their participation in interactive events (Silva & Mulick, 2009).

Although it is possible to observe its signs in the first years of life, the diagnosis of ASD tends to be generally confirmed after the child is 5 years old. This tends to occur due to the broad spectrum of ASD semiology, which presents different intensities of signs and symptoms and associations with comorbidities, which often makes it difficult to differentiate between an ASD, a developmental delay or, still, of a child's personality picture. And, also, the restriction on access to evaluation methods for this age group, as they have a high financial value, a specific use for certain professions, and the difficulty of having materials translated into the local language (SBP, 2019).

In view of this, there are, in clinical practice, instruments that check the presence of ASD signs, such as the Assessment System for Suspected Autism Spectrum Disorder - Protea-R (Bosa &Salles, 2018), which checks for the existence of possible autistic behaviors during children's games. These measurements do not demonstrate the possible global changes in the child`s development, which, if evaluated, could help in the therapeutic practice for this as well as serve as a warning sign for the presence of a possible ASD.

Therefore, the aim of this study is to analyze the global development of children at risk for ASD in its 5 domains: cognition, communication (expressive and receptive), motor skills (fine and gross), adaptive and socio-emotional behavior, and correlate with the signs indicative of the TEA.

METHODS

This study is characterized as descriptive and correlational, cross-sectional and included the participation of 9 male children, aged between 24 and 41 months (mean 33 months, SD = 0.334), linked to an institution that serves people with disabilities and who were suspected of having ASD according to the evaluation of the Protea-R (Bosa &Salles, 2018).

The sample was selected at random, and only infants who did not have neurological and orthopedic impairments that could interfere with the evaluation processes of this study were included. Parents and/or guardians of the children also participated in the study by answering the interviews and questionnaires.

Protea-R is an instrument aimed at tracking the presence of behaviors relevant to ASD semiology in children aged between 24 and 60 months, through semi-structured play situations. It is subdivided into 3 axes: 1) Anamnesis interview; 2) Behavioral assessment protocol for children with suspected ASD and 3) Feedback interview (Bosa &Salles, 2018).

The first axis corresponds to a semi-structured interview carried out with those responsible for the child in order to seek information about their development in motor, communicative (verbal and non-verbal), socio-emotional and play aspects, in addition to finding out what were the signs that triggered the indicative of ASD in the child.

The second axis consists of 17 items that investigate the main diagnostic criteria of ASD, divided into 3 areas: 8 items related to socio-communicative behaviors (shared attention initiative and response, imitation, social engagement, smile, search and

response to physical contact -affective, seeking assistance and protest and/or withdrawal from interaction); 6 regarding the quality of play (exploration of toys, form of exploration, visual motor coordination, functional play, symbolic play and its sequence) and; 3 items referring to repetitive and stereotyped movements of the body (repetitive behavior of hands, other parts of the body and self-harm).

Of these 17 items, the instrument uses only 5 behaviors, considered critical items, for the final assessment and coding of scores, which refer to Shared Care Initiative (IAC), Shared Care Response (RAC) and Imitation (IMI), which characterize Socio-Communicative Behaviors; Symbolic Play (BS) that defines Play Quality and Repetitive Movements of Other Parts of the Body (MR).

Each item receives a score ranging from 0 to 3 according to the quality of behavior presented during the assessment. In general, the greater the presence of behavioral changes, the higher the score for each item.Finally, the final coding classifies the individual into: at Risk for ASD, Relative Risk for ASD or No Risk for ASD.

The third axis proposes a feedback to parents about the findings found during the assessment, guidance on the therapeutic referrals to be made and advice on household behaviors to be applied(Bosa &Salles, 2018). The first and third axes will not be presented here.

For the assessment of global development, the Bayley III (Bayley) Baby and Toddler Development Scales (Bayley, 2018) were used, which aim to identify delays in child development and provide information for a possible intervention plan.

It consists of 5 scales that assess cognitive development, receptive and expressive language, global and fine motor skills, socio-emotional behavior and adaptive behavior.

The cognitive scale measures sensorimotor development, object exploration and manipulation, concept formation, memory, among others. The assessment of receptive language includes the verification of pre-verbal behaviors, identification of objects and images, vocabulary, social references and verbal comprehension. The measurement of expressive language involves the assessment of pre-verbal communication, vocabulary development and morphosyntactic.

The assessment of fine motor skills involves the assessment of gripping skills, perceptual-motor integration, motor planning and motor speed, in addition to functional skills and activities related to visual tracking. The subtest related to gross motor skills assesses static and dynamic body movement, locomotion, coordination, balance and motor planning.

The socio-emotional questionnaire assesses the child's functional emotional skills such as self-regulation and interest in the world, communication of needs, interaction, among other skills. And, the adaptive behavior inventory assesses the skills in the child's activities of daily living through items related to communication, community life, health and safety, leisure, self-care, self-direction, pre-academic function, domestic, social and motor life.

The results of developmental levels can be provided in several ways such as percentile classifications, determination of developmental age, performance categorization, among others (Bayley, 2018).For this study, the descriptive classification of each domain of development will be used, in relation to the mean values of a neurotypic population, for a better understanding of the global development of children at risk for ASD.

Statistical analysis of data will be done descriptively and with the aid of a Minitab statistical program. If the sample is classified into two groups by Protea-R (Bosa &Salles, 2018), with risk for ASD and relative risk for ASD, the existence of a possible distinction of the group by the degree of global development assessed by Bayley (Bayley, 2018) will be verified, as well as the possible comparison and correlation between the measured variables.

The Consent Forms authorizing the research were signed by the parents and/or guardians of the participating infants and by the collaborating entity in the study, which was approved by the Research Ethics Committee under CAAE nº 11842519.0.0000.5636. This study followed all the guidelines of the Declaration of Helsinki.

RESULTS

Of the 9 children evaluated by Protea-R, 6 presented as a result Risk for ASD and 3 Relative Risk. Your scores on critical items can be checked in Chart 1 in order of commitment.

m16

Graph 1 - Score of critical items for ASD being a child 1 to 6 with Risk for ASD, 7 to 9 with Relative Risk for ASD
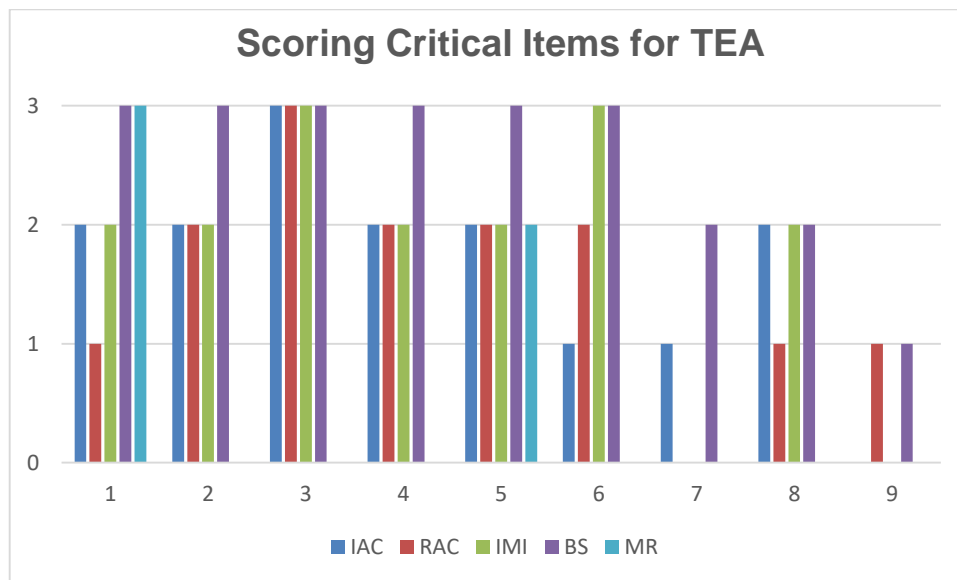
The descriptive classification of cognitive development, language, motor skills and sensory processing capacity determined by the social-emotional scale and adaptive behavior of infants assessed by the Bayley Scales can be seen in Table 1.

Table 1 – Descriptive classification of the performance level of children assessed in the five areas of development.

Children	Cognitive	Language	Motor	Socioemotional	Adaptive Behavior
With Risk for ASD					
1	Low average	Low average	Low average	Borderline	Extremely low
2	Low average	Extremely low	Low average	Borderline	Average high
3	Average	Extremely low	Average	Low average	Higher
4	Average	Average	Higher	Borderline	Higher
5	Low average	Extremely low	Borderline	Borderline	Extremely low
6	Extremely low	Extremely low	Borderline	Extremely low	Average
Relative Risk ASD					
7	Average	Borderline	Borderline	Borderline	Extremely low
8	Average	Average	Average high	Borderline	Average
9	Average	Average	Low average	Average high	Average high

Descriptive data were numerically classified to perform the statistical analysis as: 0 – extremely low; 1 – borderline; 2 – low average; 3 – average; 4 – high average; 5 – higher and; 6 – veryhigh.

At the 10% significance level, it was not possible to observe a statistical difference between the groups, with Risk for ASD and Relative Risk for ASD, by the Mann-Whitney test in the five areas of development: cognitive=error/equal values; language, p=0.131; motor, p=1.00; socioemotional, p=0.599 and; adaptive behavior, p=0.599.

Spearman's paired correlation between the five Bayley areas and the final Protea-R criteria for the total sample, at a 10% statistical significance level, occurred between the variables: adaptive behavior x RAC, p= 0.663 and p= 0.052; cognitive x BS, p= -0.601 and p= 0.087; language x BS, p= -0.604 and p= 0.085; adaptive behavior x MR, p= -0.592 and p= 0.093; language x cognitive, p=0.615 and p=0.078; socioemotional x cognitive, p= 0.664 and p= 0.051 e; adaptive behavior x motor, p= 0.658 and p= 0.054.

To perform Fischer's exact test, between groups, data were grouped into two sets: 0 to 2 – below average and 3 to 6 – average and above average. At the level of statistical significance of 10%, there was independence between the results only for the cognitive variable (p = 0.167).

When comparing the values of the sample used with the standardized data of the typical population, using the Wilcoxon test, it was found that, at a significance level of 10%, the cognitive, language and socio-emotional variables had mean results lower than those of typical children (p=0.050; p=0.018 and p=0.008).

m₁₆

DISCUSSION

According to the results presented, it can be noted that cognitive impairment occurred only in the group with higher intensity of autistic signs, that is, in the group of children at Risk for ASD.

Although cognitive impairment is not considered a diagnostic criterion for ASD, it has been observed in many infants. Macedo et al. (2013) when evaluating the fluid intelligence of 18children with ASD, aged between 4 and 7 years, found that 55.6% of these infants had an intelligence quotient below the population average for this age group, in addition to impaired skills related to concrete and abstract reasoning and fine motor skills.

Overall, cognitive skills help children's interactive process and control their thoughts and emotions. Deficits in this domain can impair the development of higher psychological processes such as organization, planning and problem solving, in addition to their broader socio-emotional relationships (Diamond, 2013).

Language impairment was seen in 5 of the 6 children at Risk for ASD and in 1 infant at Relative Risk for ASD. Language, according to the Cultural Historical Theory (Vygotsky, 1989), is the mediating agent of human learning and development, which is associated with both the physical body and the central nervous system, culminating in a peculiar adaptive capacity of the species.

ASD is marked by inability in social interaction and communication associated with restrictive and repetitive behavior. In this sense, the role of language in the face of the social interaction process and in the face of difficulties in expressing oneself is evident, which may lead to manifestations of restrictive and repetitive behaviors as an internal resource for psychological organization.

The internalization of language is an indicator of cognitive development. Therefore, mastery of the linguistic code enables abstraction, cognitive activity and the organization of verbal thought. Therefore, the processes of analysis and generalization that constitute the foundation of the intellectual act depend on the logical structure of speech. The meaning of words is the fundamental arrangement of thought, the basis of ideas, which develops in childhood and allows for qualitatively new and superior forms of intellectual and behavioral functions.

Even though there is no statistical correlation between language and shared attention (IAC and RAC) in the assessed children, it is known that it is described as a fundamental skill for language development (Tomasello, 2003). Thus, understanding themselves and others as intentional agents allows children to participate in episodes related to the coordination of care between a social partner and a referent, in order to share interest. In other words, language exerts a strong influence both on external, interpersonal, social communication and on the construction of knowledge, as well as on internal communication, which is responsible for cognitive processes.

The data referring to motor skills showed that 4 of the 6 children with Risk for ASD and 2 of the 3 infants with Relative Risk for ASD present impairments in these behaviors. Although motor components are not described as diagnostic criteria for ASD, several studies have reported the presence of these (Busto & Braccialli, 2018; Catelli, D`Antino & Blascovi-Assis, 2016; Soares & Calvacante Neto, 2015).

Aspects of motor skills in childhood have serious repercussions on learning processes and human development. It is necessary to recognize that the affective, motor and cognitive aspects are inseparable, with motricity at the origin of thought (as the symbolic function advances, the representation enables the internalization of the motor act). Thus, evidencing the inseparability between motricity and cognitive processes.

When considering the human being as organically social, it is also evident that the dimensions of affectivity and motor activities have a decisive importance in the child's development to that with respect, it is enlightening to remember that motricity is intended beyond the execution of intentional tasks of the motor act to solve problems. Motor actions assume, from an early age, to be an action directed at a social partner, both by solicitude and by manifest responsive action. Loaded with emotion, they express affectivity in the search for the regulation of emotional states. In other words, motor expressiveness is inextricably related to the child's language, thought and perception development (Wallon, 2007).

With the maturation of the central nervous system and the development of oral language, from the age of two, memory emerges for facts and biographical data. Socio-emotional skills help the child to deal with the demands of everyday life. This includes solving challenges with creativity and responsibility, thinking about solutions to conflicts, showing empathy, having good communication and making coherent and assertive decisions. It is through these skills that children begin to solve demands from the simplest, to the most complex of everyday life, for the full exercise of citizenship.

The 6 children with Risk for ASD and 2 of the 3 infants with Relative Risk for ASD had impairments in socio-emotional skills. This result demonstrates that when they are inserted in the social spheres, in addition to the family, they tend to gradually manifest inappropriate attitudes and behaviors to social interaction among their peers in different social contexts. Difficulties in socio-emotional skills indicate risks for the performance of activities of everyday life, as these depend on interpersonal relationships.

The expression of adaptive behaviors contributes to the child's interaction process with its environment. Adaptive behavior requires the body's capacity for self-regulation, which consists of managing emotions towards achieving goals. Self-regulation then becomes a multidimensional construct, with emphasis on cognitive and emotional aspects (Dias & Seabra, 2018).

The results of the adaptive behavior assessment indicated that 2 out of 6 children at Risk for ASD and, 1 out of 3 infants at Relative Risk for ASD suggesting a deficit in this area. Commitment in these behaviors point to difficulties in the interactional processes of these children with their environment.

Despite the evaluations carried out, the data presented show the perception of parents and other professionals regarding the semiology of the ASD and the presence of the ASD phenotype in their children. This fact can be noticed during the anamnesis performed with the children's caregivers when they mention the presence of sleep disorders, aggressive behaviors and tantrums, speech difficulties and confusion between pronouns, walking on tiptoe, anxiety in the presence of strangers, difficulties in school adaptation and changes in routine, preference for individual play, difficulty in symbolic play, preference for wheeled toys, food selectivity and body rocking movements.

According to the results presented in table 1, there is a greater presence of delays in cognitive, language and motor development in individuals at Risk for ASD than in others, in addition to a difference in the age of development between these skills, demonstrating, once again, the variability in the compromises of the ASD semiology.

CONCLUSION

This study allowed reflections on the integral development of children aged two to three years and six months from the theoretical framework of typical development in early childhood to then try to understand the development of children with suspected ASD.

The ASD is characterized by the presence of socio-communicative deficits and repetitive and restricted behavior patterns in varying degrees of impairment. It was not possible, in this study, to determine a pattern of global development in these individuals, but the results found suggest a deficit in development in the five domains assessed by Bayley.

Although cognitive ability is not a diagnostic criterion, it seems to be closely related to ASD during the period of linguistic and social-emotional skills development.

Careful monitoring by parents and health professionals about changes in child development is extremely important to minimize developmental deficits through early therapies and to investigate the existence of possible neurodevelopmental disorders.

Appropriate health care, including parental guidance on playing, conducting activities of daily living, inclusion in quality educational, sports and leisure practices, proper nutrition and health care, cultivating the habit of reading from an early age, affective, safe and stimulating family environment, stable and encouraging relationships, are childhood development strategies that provide the foundation for each child to live well in the present and reach their full potential in the future.

ACKNOWLEDGMENT

REFERENCES

American Psychiatry Association (APA). (2014). *Diagnostic and statistical manual of mental disorders-DSM-V.* Porto Alegre: Artmed.

Amorim, R. C. A., Laurentino, G. E. C., Barros, K. M. F. T., Ferreira, A. L. P. R., Filho, A. G. M.&Raposo, M. C. F. (2009). Family health program: proposal to identify risk factors for neuropsychomotor development. *Rev bras physiotherapist,* 13, 6, 506-13.

Bayley, N. (2018). *Baby and Toddler Developmental Scales*. 3rd ed. São Paulo: Pearson.

Bosa, C. A. & Salles, J. F. (2018). *PROTEA-R Sistema de Avaliação de Suspeita do Transtorno do Espectro Autista*. 1. ed. São Paulo: Vector.

Busto, A. L. M., & Braccialli, L. M. P. (2018). Perfil psicomotor de crianças com transtorno do espectro autista. *Revista Diálogos e Perspectivas em Educação Especial*, 5, 2, 59-70.

Catelli, C.L. R Q.; D`Antino, M. H. F.& Blascovi - Assis, S. M. (2016). Aspectos Motores em Indivíduos com Transtorno do Espectro Autista: Revisão de Literatura. *Cadernos de Pós-Graduação em Distúrbios do Desenvolvimento*, São Paulo, 16, 1, 56-65. Doi: 10.22310/18094139/cpdd.v16n1p56-65.

Diamond, A. (2013). Executive functions. *Annual Review of Psychology*, 64, 135-68.

Dias, N. M. & Seabra, A. G. (2018). Neuropsicologia com pré-escolares: Avaliação e intervenção. São Paulo: Pearson.

Macedo, E. C., Mecca, T. P., Valentini, F., Laros, J. A., Lima, R. M. F. & Schwartzman J. S.(2013). Utilizando o teste não verbal de inteligência SON-r 2 ½ - 7[a] para avaliar crianças com Transtornos do Espectro do Autismo. *Revista Educação Especial*, 26, 47, 603-618, set/dez.

Maria-Mengel, M. R. S. & Linhares, M. B. M. (2007). Risk factors for infant developmental problems. *Rev Latino-Am. Nursing,* 15, 837-42.

m₁₆

Ozonoff, S., Iosif, A. M., Baguio, F., Cook, I. C., Hill, M. M., Hutman, T.& Young, G. S. (2010). A prospective study of the emergence of early behavioral signs of autism. *Journal of the American Academy of Child and Adolescent Psychiatry*, 49, 3, 256-66.

Silva, M.&Mulick, J. A. (2009). Diagnosing autistic disorder: fundamental aspects and practical considerations. Psychology: Science and profession, 29, 1, 116-31. DOI: https://doi.org/10.1590/S1414-98932009000100010.

Soares, A. M., & Calvacante Neto, J. L. (2015). Avaliação do Comportamento Motor em Crianças com Transtorno do Espectro do Autismo: uma Revisão Sistemática. *Rev. bras. educ. espec.* [online], 21, 3, 445-458.

Sociedade Brasileira de Pediatria (SBP). (2019). Transtorno do Espectro Autista. *Manual de Orientação.* Departamento Científico de Pediatria do Desenvolvimento e Comportamento, 5, 1-24.

Tomasello, M. (2003). *Cultural origins of human knowledge acquisition*. São Paulo: Martins Fontes.

Vygotsky, L. S. (1989). *The social formation of the mind*.7. ed. São Paulo: Martins Fontes.

Wallon, H. (2007). The child's psychological evolution. São Paulo: Martins Fontes.