Original Article

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Factors related to social communication functionality in children with autism spectrum disorder: a preliminary study

Fatores relacionados à funcionalidade da comunicação social em crianças com transtorno do espectro do autismo: estudo preliminar

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ABSTRACT

Purpose: to analyze the association between social communication functionality in children with Autism spectrum disorder (ASD) according to sociodemographic aspects, communicative acts, severity of ASD and family perception. **Methods:** this is the pilot stage of a cross-sectional analytical observational study. Children with ASD were evaluated and their caregivers were interviewed. The variables analyzed were ASD severity, socioeconomic aspects, communicative acts, communicative difficulties and the classification of functionality of social communication. For association analyses, the Pearson and Kruskal-Wallis chi-square tests were used. **Results:** Sixteen children aged between 3 and 10 years were evaluated. The participants included in the study presented median levels of social communication functionality. The children with the greatest social communication difficulties were the ones caregivers had the impression other people made fun of . There was no association regarding communication functionality and socioeconomic aspects, ASD severity and communicative acts per minute. **Conclusion:** This study triangulates the communication functionality of children with ASD with environmental and social factors. Children with ASD in outpatient care at a specialized service showed intermediate levels of social communication. Difficulties in acceptance and social inclusion are more commonly observed in children with ASD with greater communication deficits.

Keywords: Autism Spectrum Disorder; Child language; International classification of functioning, disability and health; Social communication disorder

RESUMO

Objetivo: analisar a associação entre funcionalidade da comunicação social de crianças com transtorno do espectro do autismo (TEA) segundo aspectos sociodemográficos, atos comunicativos, gravidade do TEA e percepção da família. **Métodos:** trata-se da etapa piloto de um estudo observacional analítico de recorte transversal. Crianças com TEA foram avaliadas e seus cuidadores foram entrevistados. As variáveis analisadas foram: gravidade do TEA, aspectos socioeconômicos, atos comunicativos, dificuldades comunicativas e a classificação de funcionalidade da comunicação social. Para as análises de associação foram utilizados os testes Qui-quadrado de Pearson e Kruskal-Wallis. **Resultados:** foram avaliadas 16 crianças com idade entre 3 e 10 anos. Os participantes incluídos no estudo apresentaram níveis medianos de funcionalidade da comunicação social. As crianças com mais dificuldades na comunicação social foram as que os cuidadores afirmaram ter a impressão de que as pessoas zombavam delas. Não houve associação em relação à funcionalidade da comunicação e aspectos socioeconômicos, gravidade do TEA e atos comunicativos por minuto. **Conclusão:** este estudo faz a triangulação entre a funcionalidade da comunicação de crianças com TEA com fatores ambientais e sociais. Crianças com TEA em atendimento ambulatorial em serviço especializado apresentaram níveis intermediários em comunicação social. As dificuldades na aceitação e inclusão social são mais observadas em crianças com TEA com maiores déficits de comunicação.

Palavras-chave: Transtorno do Espectro Autista; Linguagem infantil; Classificação internacional de funcionalidade, incapacidade e saúde; Transtorno de comunicação social

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INTRODUCTION

Autism spectrum disorder (ASD) is a neurodevelopmental disorder characterized by persistent deficits in reciprocal social communication, verbal and nonverbal communication, social interaction, and limited and repetitive patterns of behavior and interest. These changes manifest at the beginning of development and have a wide severity range[1].

Communication deficits are evident in both comprehension (processing information input) and expression (using verbal and nonverbal language)[2,3]. There is also a great restriction in communicative intention; communication is usually aimed at asking for objects and protesting, whereas they have major difficulties interacting, calling attention to themselves, sharing attention[3], being reciprocal, and beginning and maintaining a conversation[4].

Moreover, pragmatics is pointed out as the most affected subsystem among the functional aspects of language – i.e., they have greater difficulty in using the various language functions coherently with the context[5]. Thus, functioning may be related to the quantity and diversity of communicative acts.

Two factors that hinder the management of changes in ASD are their complexity and variability[6]. Specifically in communication, they range from the absence of functional verbal language or the presence of minimally verbal language[7] to well-developed morphological and syntactic skills[8] and the capacity to begin and maintain socially-intended conversations[6,9].

ASD diagnosis is above all clinical – hence, social communication changes are determinants[10]. Some studies have highlighted the close relationship between communications changes and ASD severity[11,12], which increases the need to know this aspect more in-depth.

Language development depends on intrinsic and extrinsic factors. Therefore, factors such as the parents' educational attainment and socioeconomic level, the quality of interactions at home, screen use, and social exposure can also positively or negatively influence the language of typically developing children[13,14]. However, little is known about how these and other factors influence language and communication functioning in children with ASD[15]. Understanding these possible relationships may help understand difficulties in ASD and contribute to the intervention process.

Given the above, this study aimed to analyze the functioning of social communication (Autism Classification System of Functioning: Social Communication) of children with ASD according to sociodemographic aspects, communicative acts, ASD severity, and their families' perception.

METHODS

This is the pilot stage of a cross-sectional, observational, analytical study, whose sample comprised 16 children with ASD – four girls (25%) and 12 boys (75%) – aged 3 years to 10 years, 11 months, and 29 days.

The study included children with a medical diagnosis of ASD (reached by a pediatric neurologist, child psychiatrist, or pediatrician), followed up weekly by speech-language-hearing therapists at the Language Outpatient Center of the Clinics Hospital of the Federal University of Minas Gerais. The exclusion criterion was scoring less than 30 points (cutoff) in the Childhood Autism Rating Scale (CARS). Two participants scored less than the cutoff and were excluded from the study.

Throughout the intervention process, other health and education professionals (e.g., occupational therapists, psychologists, psycho-pedagogues, and so forth) also followed up on the study children. However, the treatment duration and intervention frequency varied widely, and some data were imprecise – hence, they were not analyzed.

The study was approved by the Research Ethics Committee of the Federal University of Minas Gerais, under protocol no. 02470618.1.0000.5149. The children's parents were informed about the volunteer participation in the study, its objectives, and consequences, and signed an informed consent form.

Procedures

After selecting and recruiting participants, data were collected by directly assessing the individuals and interviewing their caregivers.

ASD severity was estimated with CARS, in its standardized version validated for Brazilian Portuguese. It helps identify children with ASD and distinguish mild, moderate, and severe cases[16]. It was applied by observing the children's interaction with the therapist and caregiver and interviewing caregivers. The score was analyzed as follows: no autism (15 to 29 points), mild-moderate autism (30 to 36 points), and severe autism (above 36 points).

Economic classifications were assessed with the Brazilian Economic Classification Criteria (CCEB) – a system that stratifies the purchasing power into classes from A to E (class A has a greater purchasing power, and class E, a smaller one). The parameters to delimit economic classes are the householder's purchasing power and educational attainment[17]. The questionnaire is self-applied – hence, it was administered to the caregiver, who was instructed to check the answers that corresponded to their reality.

Communicative acts were assessed with the validated pragmatics test protocol in the ABFW Child Language Test to analyze quantitatively the participants' production of communicative acts and determine their communication profile in terms of the expected for their age[18]. The study used the test to consider nonlinguistic aspects, functions and means of communication (gestural, vocal, and verbal), and communicative space used by the children. Echolalia was also considered when it had a self-regulatory function and/or was accompanied by a communicative intention. The children's interactions with familiar adults were recorded in 10-minute videos, with fun activities of the children's interest. They were later analyzed regarding the children's communicative acts. The quantitative analysis considered the number of communicative acts per minute, and the responses were classified as "expected for the age" or "abnormal".

ABFW Child Language Test – pragmatics test was chosen for this study because of the objective analysis parameters, through which direct relationships can be established between what is within normal limits and what is abnormal based on the number of communicative acts.

The caregivers' perceptions of language difficulties of children with ASD were surveyed with the Communicative Difficulties Questionnaire. It was produced in Brazil and validated in 2012 mainly to identify parental difficulties in

communicating with their children with ASD[19]. The caregivers were asked the questionnaire questions in interviews. To which they should answer "totally disagree", "disagree", "agree", or "totally agree" – however, there is no score. In the end, the answers are verified to survey the main difficulties pointed out. Each answer was analyzed separately.

Lastly, the Autism Classification System of Functioning: Social Communication (ACSF:SC) was applied – a standardized scale[9], adapted to be used in Brazil[20]. It is a classification system based on the International Classification of Functioning that aims to furnish a common language to classify social communication in preschoolers with ASD (children aged 3 years to 5 years, 11 months, and 29 days). It has five levels that distinguish social communication skills according to performance (whether they do it habitually) and capacity (whether they do it in a controlled setting), focusing on their strengths and needs for support. Performance was classified based on the families' reports through structured conversations regarding the children's communication in social settings. The evaluator analyzed the information they gave and classified the level of performance. Capacity was classified based on the 10-minute interaction with a familiar adult recorded to assess communicative acts. A single evaluator classified their functioning, encompassing both capacity and performance. The answers were classified from I to V, in which I is the best level of social communication, and V is the greatest need for support.

Data analysis

To reach the study objective, descriptive data analysis was performed through the frequency distribution of the categorical variables and analysis of the measures of central tendency and dispersion of the continuous variables.

The following variables were groups for the bivariate analysis: CCEB answers were grouped into A/B (A, B, B1), C/D-E (C1, C2, D-E); and those of the Communicative Difficulties Questionnaire were grouped into "disagree" (totally disagree/disagree) and "agree" (totally agree/agree).

The association analysis used Pearson's chi-square test and Kruskal-Wallis' test. The latter was chosen because the age did not have a normal distribution, confirmed with Shapiro-Wilk and Kolmogorov-Smirnov tests, whose values were below 0.05. Results with statistical significance were those with p-value ≤ 0.05.

Data were entered, processed, and analyzed in SPSS, version 25.0.

RESULTS

The total sample had 16 participants, with a mean age of 5.94±2.11 years and a median age of 5.50 years, most of them males (75.0%). The caregivers' reported educational attainment was predominantly complete middle school to incomplete high school or complete high school to incomplete higher education (43.7%). As for economic classification, most of them belonged to class B2 in CCEB (31.2%), followed by C2, D-E (both with 25%), and C1 (18%).

Concerning ASD severity assessed with CARS, the study sample was distributed as follows: 62.5% were mild-moderate, and 37.5% were severe. The participants' results in the ABFW Child Language Tests – Pragmatics Test (which considered the number of communicative acts per minute) was 64.3% "abnormal" and 35.7% "as expected for the age".

Their social communication functioning (ACSF:SC) was classified into levels II to IV (level II: began conversations or responded to them to communicate with social objectives regarding their interests and maintained the communication until the other person changed the subject; level III: began communication with people they knew to have their interests met and tried to begin communication with social objectives; level IV: tried to begin communications with the primary caregiver, tried to respond to communication began by people they did not know. In performance, most subjects were in level III (56.2%), followed by level IV (25%) and level II (18.8%). In capacity, most subjects were in level III (57.1%), followed by level II (28.6%) and level IV (14.3%). The descriptive analysis results obtained from the Communicative Difficulties Questionnaire are shown in Figure 1.

The association analysis of ACSF:SC performance and ACSF:SC capacity with Pearson's chi-square test revealed no statistically significant association in any of the variables analyzed (Table 1).

The association between ACSF:SC performance and capacity and age through Kruskal-Wallis' test revealed no statistically significant association in any of the items analyzed (Table 2).

The association analysis with Pearson's chi-square test between ACSF:SC performance and ASD severity (CARS), ACSF:SC performance and the pragmatics test, ACSF:SC capacity and ASD severity (CARS), ACSF:SC capacity and the pragmatics test revealed no statistically significant result in any of the items analyzed (Table 3).

The analysis between ACSF:SC performance and capacity and the Communicative Difficulties Questionnaire with Pearson's chi-square test revealed a significant association between question 9 ($p = 0.009$) – "I feel people make fun of my child when trying to communicate something" –, as all those in level IV agreed with the question (Table 4).

DISCUSSION

This study investigated the relationship between environmental and social factors and social communication functioning in children with ASD. Hence, it assessed 16 children undergoing outpatient speech-language-hearing care. Brazilian, European, Asian, and North American studies also had an approximate sample size[21-23], reflecting difficulties in recruiting participants and involving the population in research.

Children in this study whose caregivers felt others made fun of them had the greatest social communication difficulties. This confirms data in the literature, as prejudice and low acceptance in society are still great challenges to the social integration of people with ASD[24,25]. Prejudice at school at different moments of the students' adaptation is also pointed out as one of the greatest difficulties in the inclusion process[26]. Thus, this aspect must be addressed when guiding the parents of children with ASD during the process of speech-language-hearing assessment, diagnosis, and rehabilitation.

According to the economic classification, most caregivers' educational attainment was between complete middle school and complete high school, and their purchasing power was low.

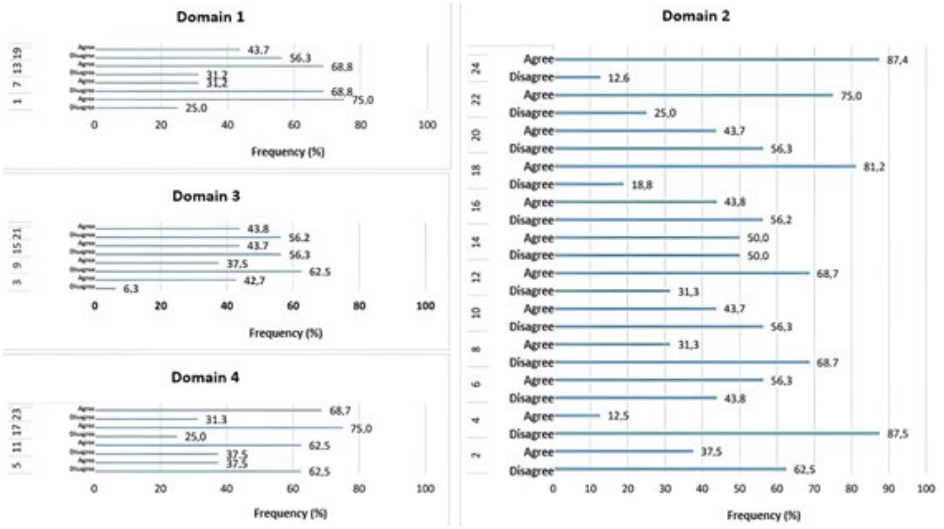

Figure 1. Descriptive analysis of the answers to the Communicative Difficulties Questionnaire per domains (**Source:** Developed by the authors)
Subtitle: % = percentage. (**Note:** Numbers on the left side of the figure indicate the questionnaire items)

Table 1. Association between the Autism Classification System of Functioning: Social Communication and sociodemographic data

Variables	ACSF:SC Performance				ACSF:SC Capacity			
	Level II N (%)	Level III N (%)	Level IV N (%)	p-value	Level II N (%)	Level III N (%)	Level IV N (%)	p-value
Sex								
Females	1 (33.3)	3 (33.3)	0 (0.0)	0.411	2 (50.0)	1 (12.5)	0 (0.0)	0.239
Males	2 (66.7)	6 (66.7)	4 (100.0)		2 (50.0)	7 (87.5)	2 (100.0)	
Total	3 (100.0)	9 (100.0)	4 (100.0)		4 (100.0)	8 (100.0)	2 (100.0)	
Caregiver's educational attainment								
Elementary school complete/ middle school incomplete	0 (0.0)	1 (11.1)	0 (0.0)	0.123	0 (0.0)	0 (0.0)	0 (0.0)	0.497
Middle school complete/high school incomplete	2 (66.7)	2 (22.2)	3 (75.0)		2 (50.0)	3 (37.5)	1 (50.0)	
High school complete/higher education incomplete	0 (0.0)	6 (66.7)	1 (25.0)		1 (25.0)	5 (62.5)	1 (50.0)	
Higher education complete	1 (33.3)	0 (0.0)	0 (0.0)		1 (25.0)	0 (0.0)	0 (0.0)	
Total	3 (100.0)	9 (100.0)	4 (100.0)		4 (100.0)	8 (100.0)	2 (100.0)	
CCEB								
A/B	1 (33.3)	3 (33.3)	1 (25.0)	0.953	2 (50.0)	2 (25.0)	1 (50.0)	0.627
C/D-E	2 (66.7)	6 (66.7)	3 (75.0)		2 (50.0)	6 (75.0)	1 (50.0)	
Total	3 (100.0)	9 (100.0)	4 (100.0)		4 (100.0)	8 (100.0)	2 (100.0)	

Pearson's chi-square test
Subtitle: N = number of individuals (varies due to missing data); % = percentage; ACSF:SC = Autism Classification System of Functioning: Social Communication; CCEB: Brazilian Economic Classification Criteria; A/B C/D-E = economic classes

Table 2. Association between age and the Autism Classification System of Functioning: Social Communication

Variables	ACSF:SC Performance				ACSF:SC Capacity			
	Level II	Level III	Level IV	p-value	Level II	Level III	Level IV	p-value
Age (years)								
Mean	5.67	5.89	6.25		5.50	6.38	4.00	
Standard deviation	2.08	2.09	2.75	0.932	1.73	2.45	1.41	0.350
Median	5.00	6.00	6.50		5.00	6.00	4.00	

Kruskal-Wallis' test
Subtitle: ACSF:SC = Autism Classification System of Functioning: Social Communication

Table 3. Association between the Autism Classification System of Functioning: Social Communication, Childhood Autism Rating Scale, and BFW Child Language Test – Pragmatics Test

Variables	ACSF:SC Performance				ACSF:SC Capacity			
	Level II N (%)	Level III N (%)	Level IV N (%)	p-value	Level II N (%)	Level III N (%)	Level IV N (%)	p-value
CARS								
Mild-moderate ASD	3 (100.0)	6 (66.7)	1 (25.0)		4 (100.0)	5 (62.5)	1 (50.0)	
Severe ASD	0 (0.0)	3 (33.3)	3 (75.0)	0.118	0 (0.0)	3 (37.5)	1 (50.0)	0.307
Total	3 (100.0)	9 (100.0)	4 (100.0)		4 (100.0)	8 (100.0)	2 (100.0)	
Pragmatics test								
Expected for the age	2 (66.7)	3 (37.5)	0 (0.0)		3 (75.0)	2 (25.0)	0 (0.0)	
Changed	1 (33.3)	5 (62.5)	3 (100.0)	0.231	1 (25.0)	6 (75.0)	2 (100.0)	0.122
Total	3 (100.0)	8 (100.0)	3 (100.0)		4 (100.0)	8 (100.0)	2 (100.0)	

Pearson's chi-square test

Subtitle: N = number of individuals (varies due to missing data); % = percentage; ACSF:SC = Autism Classification System of Functioning: Social Communication; CARS = Childhood Autism Rating Scale; ASD = autism spectrum disorder

Table 4. Association between the Autism Classification System of Functioning: Social Communication and the Communicative Difficulties Questionnaire

	Variables	ACSF:SC Performance				ACSF:SC Capacity			
		Level II N (%)	Level III N (%)	Level IV N (%)	p-value	Level II N (%)	Level III N (%)	Level IV N (%)	p-value
Domain 1: Parents' Attitudes to their children	**1. I don't know how to react to some of my child's behaviors.**								
	Disagree	1 (33.3)	1 (11.1)	2 (50.0)	0.306	1 (25.0)	2 (25.0)	1 (50.0)	0.769
	Agree	2 (66.7)	8 (88.9)	2 (50.0)		3 (75.0)	6 (75.0)	1 (50.0)	
	Total	3 (100.0)	9 (100.0)	4 (100.0)		4 (100.0)	8 (100.0)	2 (100.0)	
	7. I get all objects my child points to.								
	Disagree	2 (66.7)	6 (66.7)	3 (75.0)	0.953	3 (75.0)	6 (75.0)	1 (50.0)	0.769
	Agree	1 (33.3)	3 (33.3)	1 (25.0)		1 (25.0)	2 (25.0)	1 (50.0)	
	Total	3 (100.0)	9 (100.0)	4 (100.0)		4 (100.0)	8 (100.0)	2 (100.0)	
	13. I always talk to my child, even if he/she doesn't talk to me.								
	Disagree	1 (33.3)	3 (33.3)	1 (25.0)	0.953	2 (50.0)	2 (25.0)	1 (50.0)	0.627
	Agree	2 (66.7)	6 (66.7)	3 (75.0)		2 (50.0)	6 (75.0)	1 (50.0)	
	Total	3 (100.0)	9 (100.0)	4 (100.0)		4 (100.0)	8 (100.0)	2 (100.0)	
	19. I can't teach new things to my child.								
	Disagree	2 (66.7)	4 (44.4)	3 (75.0)	0.545	3 (75.0)	4 (50.0)	2 (100.0)	0.364
	Agree	1 (33.3)	5 (55.6)	1 (25.0)		1 (25.0)	4 (50.0)	0 (0.0)	
	Total	3 (100.0)	9 (100.0)	4 (100.0)		4 (100.0)	8 (100.0)	2 (100.0)	
Domain 2: Parents' self-perception regarding their children	**2. I have difficulties communicating with my child.**								
	Disagree	1 (33.3)	7 (77.8)	2 (50.0)	0.324	2 (50.0)	6 (75.0)	1 (50.0)	0.627
	Agree	2 (66.7)	2 (22.2)	2 (50.0)		2 (50.0)	2 (25.0)	1 (50.0)	
	Total	3 (100.0)	9 (100.0)	4 (100.0)		4 (100.0)	8 (100.0)	2 (100.0)	
	4. I have difficulties communicating with my child when we're just the two of us.								
	Disagree	3 (100.0)	8 (88.9)	3 (75.0)	0.602	4 (100.0)	7 (87.5)	2 (100.0)	0.668
	Agree	0 (0.0)	1 (11.1)	1 (25.0)		0 (0.0)	1 (12.5)	0 (0.0)	
	Total	3 (100.0)	9 (100.0)	4 (100.0)		4 (100.0)	8 (100.0)	2 (100.0)	
	6. I have difficulties communicating with my child when there are other people in the same place.								
	Disagree	1 (33.3)	4 (44.4)	2 (50.0)	0.906	1 (25.0)	5 (62.5)	1 (50.0)	0.472
	Agree	2 (66.7)	5 (55.6)	2 (50.0)		3 (75.0)	3 (37.5)	1 (50.0)	
	Total	3 (100.0)	9 (100.0)	4 (100.0)		4 (100.0)	8 (100.0)	2 (100.0)	
	8. I have difficulties playing with my child.								
	Disagree	3 (100.0)	6 (66.7)	2 (50.0)	0.361	3 (75.0)	7 (87.5)	1 (50.0)	0.502
	Agree	0 (0.0)	3 (33.3)	2 (50.0)		1 (25.0)	1 (12.5)	1 (50.0)	
	Total	3 (100.0)	9 (100.0)	4 (100.0)		4 (100.0)	8 (100.0)	2 (100.0)	
	10. I have difficulties understanding what my child wants.								
	Disagree	2 (66.7)	5 (55.6)	2 (50.0)	0.906	3 (75.0)	4 (50.0)	1 (50.0)	0.694
	Agree	1 (33.3)	4 (44.4)	2 (50.0)		1 (25.0)	4 (50.0)	1 (50.0)	
	Total	3 (100.0)	9 (100.0)	4 (100.0)		4 (100.0)	8 (100.0)	2 (100.0)	
	12. I have difficulties understanding what my child feels.								
	Disagree	1 (33.3)	3 (33.3)	1 (25.0)	0.953	1 (25.0)	3 (37.5)	1 (50.0)	0.823
	Agree	2 (66.7)	6 (66.7)	3 (75.0)		3 (75.0)	5 (62.5)	1 (50.0)	
	Total	3 (100.0)	9 (100.0)	4 (100.0)		4 (100.0)	8 (100.0)	2 (100.0)	

* = p-value ≤ 0.05; Pearson's chi-square test

Subtitle: N = number of individuals (varies due to missing data); ACSF:SC = Autism Classification System of Functioning: Social Communication

Table 4. Continued...

	Variables	ACSF:SC Performance			p-value	ACSF:SC Capacity			p-value
		Level II	Level III	Level IV		Level II	Level III	Level IV	
		N (%)	N (%)	N (%)		N (%)	N (%)	N (%)	
Domain 2: Parents' self-perception regarding their children	**14. I don't know what to do when my child doesn't understand me or when I don't understand him/her.**								
	Disagree	2 (66.7)	3 (33.3)	3 (75.0)	0.311	3 (75.0)	3 (37.5)	2 (100.0)	0.194
	Agree	1 (33.3)	6 (66.7)	1 (25.0)		1 (25.0)	5 (62.5)	0 (0.0)	
	Total	3 (100.0)	9 (100.0)	4 (100.0)		4 (100.0)	8 (100.0)	2 (100.0)	
	16. I don't feel comfortable in public places with my child.								
	Disagree	3 (100.0)	5 (55.6)	1 (25.0)	0.141	4 (100.0)	5 (62.5)	0 (0.0)	0.056
	Agree	0 (0.0)	4 (44.4)	3 (75.0)		0 (0.0)	3 (37.5)	2 (100.0)	
	Total	3 (100.0)	9 (100.0)	4 (100.0)		4 (100.0)	8 (100.0)	2 (100.0)	
	18. I worry about my child's future.								
	Disagree	0 (0.0)	2 (22.2)	1 (25.0)	0.649	0 (0.0)	2 (25.0)	1 (50.0)	0.346
	Agree	3 (100.0)	7 (77.8)	3 (75.0)		4 (100.0)	6 (75.0)	1 (50.0)	
	Total	3 (100.0)	9 (100.0)	4 (100.0)		4 (100.0)	8 (100.0)	2 (100.0)	
	20. I get frustrated when I realize my child will not begin communication.								
	Disagree	2 (66.7)	6 (66.7)	1 (25.0)	0.347	3 (75.0)	4 (50.0)	1 (50.0)	0.694
	Agree	1 (33.3)	3 (33.3)	3 (75.0)		1 (25.0)	4 (50.0)	1 (50.0)	
	Total	3 (100.0)	9 (100.0)	4 (100.0)		4 (100.0)	8 (100.0)	2 (100.0)	
	22. I'm bothered by my child's apathy/restlessness.								
	Disagree	1 (33.3)	3 (33.3)	0 (0.0)	0.411	1 (25.0)	3 (37.5)	0 (0.0)	0.566
	Agree	2 (66.7)	6 (66.7)	4 (100.0)		3 (75.0)	5 (62.5)	2 (100.0)	
	Total	3 (100.0)	9 (100.0)	4 (100.0)		4 (100.0)	8 (100.0)	2 (100.0)	
	24. I'd like to have further information on how to communicate with my child.								
	Disagree	0 (0.0)	2 (22.2)	0 (0.0)	0.412	0 (0.0)	2 (25.0)	0 (0.0)	0.417
	Agree	3 (100.0)	7 (77.8)	4 (100.0)		4 (100.0)	6 (75.0)	2 (100.0)	
	Total	3 (100.0)	9 (100.0)	4 (100.0)		4 (100.0)	8 (100.0)	2 (100.0)	
Domain 3: Parents' perception of people's acceptance of their children	**3. I feel that other people don't understand what my child wants to communicate.**								
	Disagree	0 (0.0)	1 (11.1)	0 (0.0)	0.660	1 (25.0)	0 (0.0)	0 (0.0)	0.260
	Agree	3 (100.0)	8 (88.9)	4 (100.0)		3 (75.0)	8 (100.0)	2 (100.0)	
	Total	3 (100.0)	9 (100.0)	4 (100.0)		4 (100.0)	8 (100.0)	2 (100.0)	
	9. I feel that other people make fun of my child when he/she wants to communicate something.								
	Disagree	3 (100.0)	7 (77.8)	0 (0.0)	0.009*	3 (75.0)	6 (75.0)	0 (0.0)	0.122
	Agree	0 (0.0)	2 (22.2)	4 (100.0)		1 (25.0)	2 (25.0)	2 (100.0)	
	Total	3 (100.0)	9 (100.0)	4 (100.0)		4 (100.0)	8 (100.0)	2 (100.0)	
	15. I feel that other people avoid my child.								
	Disagree	2 (66.7)	6 (66.7)	1 (25.0)	0.347	3 (75.0)	4 (50.0)	1 (50.0)	0.694
	Agree	1 (33.3)	3 (33.3)	3 (75.0)		1 (25.0)	4 (50.0)	1 (50.0)	
	Total	3 (100.0)	9 (100.0)	4 (100.0)		4 (100.0)	8 (100.0)	2 (100.0)	
	21. I feel that other people find my child strange.								
	Disagree	3 (100.0)	5 (55.6)	1 (25.0)	0.141	4 (100.0)	3 (37.5)	1 (50.0)	0.116
	Agree	0 (0.0)	4 (44.4)	3 (75.0)		0 (0.0)	5 (62.5)	1 (50.0)	
	Total	3 (100.0)	9 (100.0)	4 (100.0)		4 (100.0)	8 (100.0)	2 (100.0)	
Domain 4: Parents' perceptions regarding their children	**5. I feel that my child doesn't understand what I say.**								
	Disagree	2 (66.7)	6 (66.7)	2 (50.0)	0.837	2 (50.0)	6 (75.0)	1 (50.0)	0.627
	Agree	1 (33.3)	3 (33.3)	2 (50.0)		2 (50.0)	2 (25.0)	1 (50.0)	
	Total	3 (100.0)	9 (100.0)	4 (100.0)		4 (100.0)	8 (100.0)	2 (100.0)	
	11. I feel that my child doesn't understand what other people say.								
	Disagree	1 (33.3)	5 (55.6)	0 (0.0)	0.159	1 (25.0)	4 (50.0)	0 (0.0)	0.364
	Agree	2 (66.7)	4 (44.4)	4 (100.0)		3 (75.0)	4 (50.0)	2 (100.0)	
	Total	3 (100.0)	9 (100.0)	4 (100.0)		4 (100.0)	8 (100.0)	2 (100.0)	
	17. I realize my child says things unrelated to the moment and/or topic.								
	Disagree	0 (0.0)	4 (44.4)	0 (0.0)	0.116	0 (0.0)	4 (50.0)	0 (0.0)	0.122
	Agree	3 (100.0)	5 (55.6)	4 (100.0)		4 (100.0)	4 (50.0)	2 (100.0)	
	Total	3 (100.0)	9 (100.0)	4 (100.0)		4 (100.0)	8 (100.0)	2 (100.0)	
	23. I feel that my child has few friends.								
	Disagree	2 (66.7)	3 (33.3)	0 (0.0)	0.166	2 (50.0)	3 (37.5)	0 (0.0)	0.478
	Agree	1 (33.3)	6 (66.7)	4 (100.0)		2 (50.0)	5 (62.5)	2 (100.0)	
	Total	3 (100.0)	9 (100.0)	4 (100.0)		4 (100.0)	8 (100.0)	2 (100.0)	

* = p-value ≤ 0.05; Pearson's chi-square test

Subtitle: N = number of individuals (varies due to missing data); ACSF:SC = Autism Classification System of Functioning: Social Communication

A survey shows that primary healthcare users in the Unified Health System (SUS) are mostly formally employed wage earners with low educational attainment[27]. This predominating characteristic of the sample may be ascribed to the profile of individuals who attend the outpatient center, as the complexity of the disorder makes them seek specialized services at the teaching hospital for treatment.

Despite the small sample size, this study's participants' ages varied widely. The literature shows that even though ASD signs are commonly noticed by 2 years old[10] (speech difficulty is what most moves people to seek treatment)[28], the mean age at diagnosis is 4 years[10]. Moreover, besides the great difficulty accessing health services[25], many children need long-term intervention[28]. Hence, the variability found in this study may be related to the late beginning of the treatment after perceiving the symptoms, age at diagnosis, access to health services, and long-term treatments.

Most children in the study had mild-moderate ASD, and none of them had the highest degree of social communication difficulties – level V. The literature shows a wide range of behavioral manifestations and cognitive and linguistic functioning in ASD[7]. It also highlights the importance of identifying homogeneous subgroups according to certain ASD characteristics, which helps guide clinical practice and influence the decision for interventions and/or access to services and support groups[29]. Thus, it is inferred that this more homogeneous information may be related to the small sample size, the profile of patients in outpatient care, or even the time and type of intervention to which children were submitted.

Also, the study sample had no child in social communication level I – in which children begin communication and respond to it with social objectives, sustaining the interactions and adapting to changes[20]. The absence of sample children in level I may be related to the profile of the service, as it is a specialized unit at a teaching hospital, which tends to receive patients from specialized outpatient centers (psychiatry, pediatric neurology, genetics, and so on). These outpatient centers receive patients mostly with a greater complexity, whose intervention could not be carried out in primary healthcare or the Family Health Support Center.

More than one third of the children had no changes in the quantitative analysis of the ABFW Child Language Test – Pragmatics Test, considering only the number of communicative acts per minute. Studies show that the most recurrent language change in children with ASD is the social use of language – i.e., in pragmatics[5]. Children have difficulties understanding and expressing language in communication contexts[2], especially to interpret figures of speech, take communicative turns, deal with nonverbal language and communication intentions, and sustaining a conversation[2,4]. The present study did not confirm previous findings[2,4,5], which suggests that the quantitative analysis of communicative acts alone does not express persistent pragmatics deficits. Hence, a qualitative analysis may find functional changes even in children whose number of communicative acts is as expected for their age.

Another point worth highlighting was the lack of association between ABFW Child Language Test – Pragmatics Test results and the social communication functioning classification in this study. The literature has been investigating the relationship between overall language skills and social skills in ASD, especially in terms of pragmatics, and has observed a direct relationship between pragmatics and social skills in ASD[5]. Therefore, it can be inferred that the number of communicative acts per minute in the present sample was not enough to express communication functioning. Hence, more in-depth studies are needed to analyze functions and means of communication.

No statistically significant association was found between social communication and sociodemographic aspects. The literature shows that parental low educational attainment and income may be related to language difficulties in typical children[14] and poorer communication performance in children with ASD and other disorders[15]. This may be associated with less access to information and services. This piece of data may not have been related due to the homogeneity of the sample regarding educational attainment and economic classification.

Even though this study found no statistically significant association between ASD severity and the social communication level, the literature reports that children with more severe ASD have greater social communication difficulties[12]. Another study in 72 children with ASD who spoke Hebrew analyzed the speech of children using an algorithm to correlate speech changes with ASD severity. The results obtained with the instrument were greatly precise in comparison with ASD severity verified with clinical assessment, thus indicating an existing relationship between speech difficulties and ASD severity[11]. Since no statistical relationship could be established in agreement with the literature, it is inferred that children in this sample may have severe limitations in certain skills that would need greater support and, consequently, indicate greater ASD severity, though not directly compromising their communicative performance.

Some limitations were found during the study, such as the uniformity of socioeconomic aspects, functioning, and ASD severity – which hindered the generalization of results. Another important limitation was that it did not observe the interventions to which children were submitted during childhood, regarding the time and methods of speech-language-hearing therapy and other areas that also influence their communication.

Furthermore, ACSF:SC was applied to the whole sample – i.e., some children were older than the recommended, which may have had implications in the study.

The results indicated viability in the observational study. However, samples must be probabilistic and stratified by sex, age, and ASD severity to obtain more robust evidence and enable the generalization of results.

CONCLUSION

The social communication functioning classification of children with ASD in the study sample showed that those in outpatient care in a specialized service had an intermediate social communication profile, ranging from level II to level IV.

It was identified that other people's disparaging reactions to the children's communication initiatives were the communication difficulty directly related to the worst social communication levels. Hence, difficulties in acceptance and social inclusion are still quite present in the lives of children with ASD, especially those who have greater social communication deficits. Communicative functioning was not associated with socioeconomic aspects, ASD severity, or communicative acts per minute.

One of the advances in this study was the interconnection between communication functioning in children with ASD and environmental and social factors. Moreover, it related communicative functioning aspects to the pragmatic assessment used in speech-language-hearing clinical practice, which

can indicate and enable the use of the social communication functioning classification system in clinical practice.

Future research should analyze qualitatively the functions and means of communication (pragmatics test) and associate them with social communication performance and capacity, using the social communication functioning classification to measure communication progress and gains obtained with long-term speech-language-hearing therapy.

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