REVISTA CEFAC
SPEECH, LANGUAGE, HEARING SCIENCES AND EDUCATION JOURNAL
Rev. CEFAC. 2020;22(3):e14919 http://dx.doi.org/10.1590/1982-0216/202022314919

Original articles

Characterization of neuropsychomotor and language development of children receiving care from groups at an extended Family Health Care Center: an interprofessional approach

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Conflict of interests: Nonexistent

Received on: October 11, 2019
Approved on: April 14, 2020

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ABSTRACT

Purpose: to characterize the language and neuropsychomotor development of children referred for speech-language-hearing and physical therapy at an Extended Family Health Care Center (NASF) in Paranaguá, Paraná, Brazil.

Methods: 36 children aged 3 to 13 (7.9 ± 2.3) years were assessed through anamnesis, speech-language-hearing assessment with a flipchart, and motor development scale (MDS). The analysis was made with the two-tailed Pearson correlation test.

Results: 69% had no initial clinical diagnosis; 83% were referred by their school, due to suspected language difficulties (92%), which were confirmed. Children both at risk and with psychomotor delays represented 69% of the sample; 78% of the children had learning difficulties and overall motor age 16 months below their chronological age, on average. The psychomotor areas with the worst scores for motor age and motor quotient were temporal organization, body scheme, and spatial organization. School difficulties were related to delays in motor age ($p = 0.03$), MDS psychomotor profile classification ($p = 0.01$), overall motor quotient ($p = 0.04$), and psychomotor diagnosis ($p = 0.001$).

Conclusion: it is concluded that children both at risk and with psychomotor delays pose a great demand. Most of them present language delays, and have difficulties in other areas as well, confirming the need for health professionals' multi- and interdisciplinary actions. NASF is an option for promoting follow-up and intervention.

Keywords: Family Health; Child Development; Child Language; Psychomotor Performance; Interdisciplinary Practices

INTRODUCTION

Childhood, or neuropsychomotor development, consists of a complex range of possible acquisitions throughout time and forms the basis for future acquisitions and skills. Professionals from different fields who work with motor functions have been focusing their studies on it[1].

This is so because, in analyzing human development, motor capacity is considered a good indicator[2], being associated even with school achievement[3]. It is through their movements that babies and children express not only neurological integrity and motor development but also aspects of affection, language and communication, cognition, and social interaction with their surroundings[4]. For this reason, it is also called psychomotor or yet neuropsychomotor development (NPMD).

The schooling period from six to 12 years old is the maturation phase of the main motor skills, which will be used in more complex sports activities as well as in leisure; therefore, they are essential for the acquisition of motor behaviors in daily life activities (DLAs)[5].

Delay in NPMD encompasses a condition in which the child does not reach skills expected for a certain age[6], which, in practical terms, is identified through lower scores in standardized tests than those indicated for the normative population[6].

In this regard, national studies point that for different reasons learning deficits are found in approximately 30%[5], and NPMD can occur in 33%[7] to 52.6%[8]. These values are high and have such a numeric variation due to different study methodologies, as well as different places and ages involved in the assessment. Medina-Papst and Marques[9] report that there is a tendency of identifying greater psychomotor delays associated with learning difficulties in older children.

It is known that there are many children whose development is at risk for various reasons and that 50% of those children could have their delays minimized through early identification and intervention[2]. Estimations indicate that 15 to 30% of schoolchildren can have learning difficulties, with consequences to their neuropsychomotor development[10].

Many of these children with school difficulties have associations with clinical conditions, as attention-deficit/hyperactivity disorder (ADHD), autism spectrum disorder (ASD), developmental coordination disorder, and others; they can be associated with neurological deficiencies and/or syndromes, as well[11]. However, many children with no diagnosed clinical conditions also present school difficulties that may be associated with psychomotor disorders identified through observation/evaluation[11,12].

Many psychomotor difficulties are associated with some type of learning difficulty, as dyslexia and specific language disorders. Reading and writing difficulties are the most frequent ones related to problems in motor coordination, whereas math difficulties are normally related to sensorimotor difficulties, such as spatial and temporal organization, and laterality[5]. Nonetheless, the different types of intelligence and learning capacities must be considered, beyond logical reasoning, mathematical and linguistic tests, including musical, spatial, bodily-kinesthetic, interpersonal, intrapersonal, naturalistic, and even a possible existential intelligence[13].

Among the areas with the greatest delay, language seems to be the one with greatest risks, especially in boys when screened through the Denver II scale[14], as well as in body scheme/speed, spatial organization, and temporal organization/language in studies using psychomotor scales[15]. Many studies in the fields of both education and health mention the use of the motor development scale (MDS) to identify signs of deviations in typical and atypical children with learning difficulties and/or NPMD delay[12,16]. Identifying such delays as soon as possible must be the focus of health[12,17,18] and education professionals[12], in their individual and intersectoral work.

The acquisition of oral language develops naturally. Thus, in typical development, when the child is approximately five years old, they already know and pronounce all sounds[19]; this should be focused on when investigating the child's development.

There is a demand for child health care in promoting their full development, for which, though, there are not always specific and/or specialized settings available, especially in situations of psychomotor deviations and difficulties which do not present any known diagnosis.

With the child's comprehensive health care in view, the Family Health Strategy and its support centers – called Extended Family Health Care Centers (abbreviated in Portuguese as NASF) – work towards implementing coordinated interdisciplinary actions to identify conditions of developmental risk and/or delay, and intervene when necessary[20,21]. These include NPMD promotion and prevention initiatives[22]. Such actions consist of early screening/identification, especially in younger children. In addition, they intervene in the environment and health of populational groups and

collectivities when development and/or learning difficulties are identified.

It is advocated that the critical period to detect and intervene on NPMD is in the first three years of life[23], investing in promoting health and preventing diseases. Nevertheless, many alterations are detected later, especially when school learning delays become more evident[9,24].

For Silva[25], behavioral, biological and environmental variables associate and interfere with NPMD from zero to five years old, favoring the occurrence of delays. The problem is that without an adequate screening many (if not most) of these children do not receive early intervention. The reality usually shows late identification in many cases, normally at school age[15].

Despite the many studies reporting the relationship between motor difficulties and school learning, there is still little Brazilian research and few screening programs in the health/school environment. Consequently, many children with difficulties do not receive adequate treatment[5].

Intervention programs must be planned to promote health comprehensively. When it comes to organizing physical activities, both to promote and rehabilitate health, psychomotricity can be a facilitating tool in the development of intervention programs[26]. However, before intervention programs are planned and developed, it is essential to understand the greatest demands and implement screening routines with interprofessional work.

This interprofessional work perspective makes psychomotor intervention actions to be optimized in the various ages, especially in situations with identified developmental risk and/or delay. In Paranaguá, Brazil, previous studies report a demand for child health care in the NASF, most of which are referred for speech-language-hearing assessment[15,24].

Thus, this study aimed to characterize the neuropsychomotor and language development of children referred for speech-language-hearing and physical therapy at the NASF in Paranaguá, PR, Brazil. It also aimed to verify the correlation between the diagnosis variables in language and/or motor deficit and school difficulties.

METHODS

This is a quantitative, observational, cross-sectional analysis, approved by the Research Ethics Committee of the *Uniandrade*, under number 1.804.197. The study assessed the neuropsychomotor development of three- to 13-year-old children referred for speech-language-hearing and physical therapy specialized care at the NASF in Paranaguá, PR, Brazil. The children were organized according to the referral: to speech-language-hearing therapy, as language alterations (L), to physical therapy, as motor alterations (M), or as both (ML)[15]. The children's participation in the research was authorized by the adults legally responsible for them through their signing the informed Consent Form (iCF).

The children were assessed in interconsultation[20,21] with a speech-language-hearing therapist – they first proceeded to the anamnesis with a relative or guardian, and then to a phonetic/phonological flipchart (with 34 printed images) containing all the phonemes of the Portuguese Language in different positions in the words[19] – and with a physical therapist, to Rosa Neto's Motor Development Scale (MDS)[1]. The assessments took place at a community health center, conducted by professionals experienced with NPMD assessment and intervention in a ludic procedure with instruments that complied with the domains in the International Classification of Functioning, Disability and Health (ICF)[27].

The anamnesis consisted of family and territory data, date of birth, gender, diagnosis and/or reason for referral, development history, and main complaint.

The phonological flipchart used 34 images – e.g., car, bus, bicycle, comb, sink, ship, boat, toothpaste, towel, wardrobe, helicopter, iron – to obtain from the child the spontaneous spoken naming of each[28,29], in which the articulation of the word was analyzed in relation to the expected for their chronological age. If the child's repertoire was below the expected for their age, they were classified as having language alteration (L) in the psychomotor diagnosis.

All the children underwent audiological assessment through vocal and pure-tone audiometry examinations at the public health care system (SUS, in Portuguese). All the results were within normality.

Rosa Neto's Motor Development Scale (MDS)[1] enables the motor development of two- to 11-year-old children to be measured through activities that test fine (FM) and global (GM) motor skills, balance (B), body scheme (BS), spatial (SO) and temporal (TO) organization, and handedness (H). This instrument makes it possible to determine the child's overall motor age (OMA) – through the score achieved by the child – and the motor quotient (MQ) – obtained through the ratio with the chronological age multiplied by 100. Thus, a general classification can be established,

besides quantifying in months whether the child has a positive (+) or negative (-) motor age in comparison with reference values for their age. The general profile is classified as very superior (130 or more), superior (120-129), normal-to-high (110-119), normal-average (90-109), normal-to-low (80-89), inferior (70-79), and very inferior (69 or less)[1]. The MDS is used in children with typical development and also to characterize NPMD in atypical situations[16].

At the end of the assessments, the initial L, M or ML referral categories were confirmed by the professionals (psychomotor diagnosis) – the language alterations (L) through the flipchart, and motor alterations (M) through the MDS, which classified them as normal-to-low, inferior, and very inferior. The children were hence classified as having language (L), motor (M), or both (ML) alterations, and their age was considered in months.

Information regarding referral – by a health (H) or education (E) professional, or by some family member's initiative (FM) – clinical diagnosis, kinetic-functional diagnosis, as well as suspicions identified by the professionals during the assessment were registered, as well as whether the child presented school difficulties reported by their parents.

To assess the relationship between the motor variables (FM, GM, B, BS, SO, TO, H, OMA, and MQ) and school difficulty (according to the parents' report and/or school referral), Pearson two-tailed correlation test was performed using the Statistical Package for the Social Sciences (IBM SPSS-23).

In addition to the physical and speech-language-hearing therapy issues, which were the focus of this study, the team counted with the support from a nutritionist and a psychologist. Moreover, there was a partnership and follow-up with more complex cases in fortnightly intersectoral meetings (health, education, and welfare), through the Paranaense Family Program, at the Welfare Reference Center (CRAS, in Portuguese) of the territory in question.

RESULTS

A total of 36 children – 25 male and 11 female – aged 7.9±2.3 years. Most of them (n = 31, 81%) had no initial clinical diagnosis of deficiency and/or difficulty previously identified. They had been referred to by their school because they suspected of language difficulties, only.

After assessment at the NASF, 10 children (28%) had language alteration diagnosis alone; one child, motor alteration diagnosis alone (because of congenital clubfoot and lower limb monoparesis; however, the child's profile was "normal-to-high, according to the MDS"); and 25 children (69%) had combined motor and language alterations. Regarding the MDS classification, of the 26 children with motor alteration diagnosis, three (8%) were classified as very inferior; 10 (28%), as inferior; 12 (33%), normal-to-low; eight (22%), normal-average; 2 (6%), normal-to-high; 1 (3%) was classified as superior. One of the children classified as normal-to-high participated in the group only for presenting motor difficulties, due to the congenital clubfoot. The other children classified as normal-to-high and superior presented only language substitution alterations.

The MDS areas with the worst scores for OMA and MQ were TO, BS, and SO. On average, the sample of children assessed was at a motor age 16 months below the expected for their chronological age. Most of the children screened (n = 28, 78%) had school learning difficulties.

In eight cases (22%), there is suspicion for possible diagnoses related mainly to ASD (three cases, two of which may be associated with intellectual deficiency - ID), cerebral palsy (CP, three cases), intellectual deficiency (one case), and dyslexia (one case). They were awaiting specialized assessment at the Municipal Specialized Health Center (CMAE, in Portuguese).

Table 1. Sample characterization

Child (n=36)	Gender	Age (y)	Clinical diag.	Susp.	Ref.	Reason ref.	Psyc. Diag.	School dif.	OMA (m)	CA (m)	OMQ	Age + or- (m)	MDS classification		MA1 FM	MA2 GM	MA3 B	MA4 BS	MA5 SO	MA6 TO	MQ1	MQ2	MQ3	MQ4	MQ5	MQ6	H
1	M	6.1	no	ASD, ID	S	L	ML	yes	46	73	63	-27	VERY INFERIOR		48	48	60	48	60	12	66	66	82	66	82	16	RH
2	M	11.3	DS		S	L	ML	yes	84	136	62	-52	VERY INFERIOR	8%	132	96	108	60	60	48	97	71	79	44	44	35	RH
3	F	8.5	no	ID	S	L	ML	yes	58	102	57	-44	VERY INFERIOR		78	48	66	48	48	60	76	47	65	47	47	59	CD
4	F	7.7	no	CP	S	L	ML	yes	69	92	75	-23	INFERIOR		90	72	72	60	72	48	98	78	78	65	78	52	RH
5	M	12.9	no		S	L	ML	yes	116	155	75	-39	INFERIOR		132	132	132	96	132	72	85	85	85	62	85	46	CD
6	M	6.3	no	ASD, ID	S	L	ML	yes	56	76	74	-20	INFERIOR		48	48	48	48	72	72	63	63	63	63	95	95	CD
7	F	7.3	LPM		S	ML	ML	yes	63	87	72	-24	INFERIOR		84	72	66	36	60	60	97	83	76	41	69	69	CD
8	M	7.3	no		Fm	L	ML	no	63	88	72	-25	INFERIOR	28%	48	72	78	60	60	60	55	82	89	68	68	68	RH
9	M	9.8	no		S	L	ML	yes	82	118	69	-36	INFERIOR		108	96	96	72	60	60	92	81	81	61	51	51	RH
10	M	5.9	no		S	L	ML	yes	56	71	79	-15	INFERIOR		48	60	48	72	60	48	68	85	68	101	85	68	RH
11	M	11.2	Asp.		S	L	ML	no	94	134	70	-40	INFERIOR		132	84	60	84	120	84	99	63	45	63	90	63	CD
12	M	5.8	no		S	L	ML	yes	52	69	75	-17	INFERIOR		48	48	60	60	60	36	70	70	87	87	87	52	CD
13	M	9.6	no		S	L	ML	yes	86	115	75	-29	INFERIOR		84	108	84	84	96	60	73	94	73	73	83	52	CD
14	M	5.8	no	CP	Fm	ML	ML	yes	58	70	83	-12	NORMAL-TO-LOW		48	48	48	60	72	72	69	69	69	86	103	103	RH
15	M	8.5	no		S	L	ML	yes	115	102	89	-13	NORMAL-TO-LOW		108	120	84	84	84	132	94	104	73	73	73	115	RH
16	M	8.1	no	CP	Fm	L	ML	yes	86	97	89	-11	NORMAL-TO-LOW		108	108	96	84	60	60	111	111	99	87	62	62	CD
17	M	8.3	no		S	L	ML	yes	84	100	84	-16	NORMAL-TO-LOW		84	108	96	72	72	72	84	108	96	72	72	72	CD
18	M	4.6	no	ASD	S	L	ML	yes	46	55	84	-9	NORMAL-TO-LOW		48	60	48	48	48	24	87	109	87	87	87	44	CD
19	F	7.6	no		S	L	ML	yes	76	91	84	-15	NORMAL-TO-LOW	33%	78	78	96	72	72	60	86	86	105	79	79	66	CD
20	M	8.7	no		S	L	ML	yes	88	104	85	-16	NORMAL-TO-LOW		108	108	84	84	84	60	104	104	81	81	81	58	RH
21	F	7.5	no		S	L	ML	yes	76	90	84	-14	NORMAL-TO-LOW		84	96	96	60	60	60	93	107	107	67	67	67	RH
22	M	10.1	no		Fm	L	ML	yes	102	121	84	-19	NORMAL-TO-LOW		108	108	132	84	120	60	89	89	109	69	99	50	U
23	F	8.3	no		S	L	ML	yes	83	99	84	-16	NORMAL-TO-LOW		90	108	84	84	72	60	91	109	85	85	73	61	LH
24	M	7.9	no		S	L	ML	yes	80	95	84	-15	NORMAL-TO-LOW		84	108	96	72	60	60	88	114	101	76	63	63	RH
25	M	7.9	no		S	L	ML	yes	82	95	86	-13	NORMAL-TO-LOW		84	96	108	72	72	60	88	101	114	76	76	63	CD
26	F	11.0	ADHD		H	L	L	no	128	132	97	-4	NORMAL-AVERAGE		132	132	108	132	132	132	100	100	82	100	100	100	RH
27	F	7.4	no		S	L	L	yes	80	89	90	-9	NORMAL-AVERAGE		84	96	96	72	72	60	94	108	108	81	81	67	CD
28	M	5.7	no		S	L	L	no	70	68	103	+2	NORMAL-AVERAGE		66	108	66	60	60	60	97	159	97	88	88	88	RH
29	M	7.3	no		S	L	L	yes	82	87	94	-5	NORMAL-AVERAGE	22%	84	108	96	72	72	60	97	124	110	83	83	69	CD
30	M	12.0	no	dyslexia	S	L	L	yes	129	144	90	-15	NORMAL-AVERAGE		132	132	126	120	132	132	92	92	88	83	92	92	RH
31	M	7.9	no		S	L	L	yes	88	95	93	-7	NORMAL-AVERAGE		84	108	84	84	84	84	88	114	126	88	88	88	RH
32	M	4.3	no		S	L	L	no	54	52	104	+2	NORMAL-AVERAGE		48	60	60	48	48	60	92	115	115	92	92	115	CD
33	F	10.0	no		S	L	L	no	114	120	95	-6	NORMAL-AVERAGE		108	132	108	108	108	120	90	110	90	90	90	100	U
34	F	3.1	CCF		Fm	M	M	no	42	37	114	+5	NORMAL-TO-HIGH	6%	48	36	36	36	36	60	130	97	97	97	97	162	RH
35	F	8.0	no		S	L	L	yes	106	96	110	+10	NORMAL-TO-HIGH		120	108	108	108	96	96	125	113	113	113	100	100	RH
36	M	4.1	no		S	L	L	no	60	49	122	+11	SUPERIOR	3%	48	60	72	60	60	60	98	122	147	122	122	122	CD
Mean	69%M	7.9	81%		83%	92%		78%	79	95	85	-16			85	89	84	72	76	67	90	95	91	78	81	74	
SD	31%F	±2.3	no		S	L		yes	23	27	14	14			29	28	25	22	25	27	16	22	20	17	16	28	

Diag.= diagnosis; y= years; m= months; susp.=suspected; ref.= referral; psyc.= psychomotor; Dif.=difficulties; OMA= overall motor age; MA= motor age; CA= chronological age; MQ= motor quotient; OMQ= overall motor quotient; M= male; F= female; DS = Down syndrome; ASD= autism spectrum disorder; Asp.= Asperger syndrome; ID= intellectual deficiency; CP- cerebral palsy; LPM= lipomyelocele; CCF= congenital clubfoot; ADHD= attention-deficit/hyperactivity disorder; S= school; Fm=family; H=health; L=language; M=motor; ML=motor and language; FM= fine motor skills; GM= global motor skills; B= balance; BS= body scheme; SO= spatial organization; TO= temporal organization; H= handedness; RH= right-handed; LH= left-handed; CD= cross-dominance; U= undefined.

The school difficulties (Table 2) are related with motor age delays in 34% of the cases (p = 0.03), with psychomotor profile in 42% as classified by the MDS (p = 0.01), and with OMQ in 47% (p = 0.04). The three motor parameters assessed pointed to significant relation between motor delays and school difficulties. Nevertheless, the relationship between language and school difficulties is indisputable, since, except for one, on all 35 diagnoses the patient presented language problems either alone or in combination with motor problems. On the correlation test between psychomotor diagnosis and school difficulty, there was a correlation of 52% (p = 0.001) – i.e., language alterations in combination with motor problems can aggravate even more the school difficulty.

Table 2. Correlation between learning and motor development variables

		Real alt.	School dif.	MDS classification	OMQ	Age + or -(m)
Real alt.	Pearson Correlation Sig. (2-tailed)	1	-.522** .001	-.811** .000	-.773** .000	-.685** .000
	N	36	36	36	36	36
School dif.	Pearson Correlation Sig. (2-tailed)	-.522** .001	1	.422* .010	.468** .004	.345* .039
	N	36	36	36	36	36
MDS classification	Pearson Correlation Sig. (2-tailed)	-.811** .000	.422* .010	1	.973** .000	.892** .000
	N	36	36	36	36	36
OMQ	Pearson Correlation Sig. (2-tailed)	-.773** .000	.468** .004	.973** .000	1	.923** .000
	N	36	36	36	36	36
Age + or - (m)	Pearson Correlation Sig. (2-tailed)	-.685** .000	.345* .039	.892** .000	.923** .000	1
	N	36	36	36	36	36

Alt.= alterations; dif.= difficulty; MDS = motor development scale; OMQ= overall motor quotient; m=month.
**. The correlation is significant at 0.01 (two-tailed)
*. The correlation is significant at 0.05 (two-tailed)

DISCUSSION

At the end of the children's screening process, it was observed that most of the children had been referred by the school due to speech/language difficulties, so they were sent to the speech-language-hearing therapist at the NASF. However, during interconsultation the speech-language-hearing and physical therapists identified associated psychomotor difficulties with no previous diagnosis. This speech/language delay identification agrees with a previous study with a smaller sample[15]. The lack of a previous diagnosis in children with psychomotor difficulties had already been reported by Fernani et al.[11], which calls attention to the necessary longitudinal multiprofessional assessment and screening, and not only through physician-oriented clinical complaints.

Despite the children with adequate NPMD who are nonetheless referred for speech-language-hearing therapy, this situation corresponded to only 31% of the sample (normal-average, normal-to-high, and superior); 36% were below the normative profile (inferior and very inferior), whereas NPMD of 33% were at risk, classified as normal-to-low. This demonstrates that, although their referrals are mostly because of speech/language alterations, these are associated with an overall NPMD below the expected for their age. In this study's sample, the overall motor age was 16 months on average below the chronological age, similar to what was evidenced by Rosa Neto et al.[30] in children with school difficulties. It was further observed that all the children in the study with normal-to-low profile had language and school difficulties, with significant correlation values between these variables. Fernani et al.[11] defend that motor quotient values between 80 and 89 (related to the normal-to-low classification) must undergo preventive interventions to avoid NPMD delays. Hence, 69% of the sample characterized in this study – i.e., the children classified as inferior and very inferior, and those with normal-to-low profile – have an indication for psychomotor (and not only language) treatment.

The relationship between language difficulties and psychomotor alterations with consequences on learning is reported by Tavares and Cardoso[10], for whom 50% of the children with learning difficulties present combined motor alterations. Moreover, studies

point to the relationship between motor and cognitive development[31,32].

Learning difficulties are considered alterations in executive functions, and thus, of brain functions, which interfere with the understanding capacity, with consequences on reading, writing and calculation skills[10]. As in this study, there is evidence of a relationship between learning difficulties and psychomotor alterations[9,30], which emphasizes the need for multiprofessional assessment in cases of learning difficulties.

Language delays, especially in boys, have already been identified in 0- to 18-month-old babies[33] and in children up to three years old[14,22]. Language has also been mentioned as the area with the greatest prevalence of delays (59%) when compared with the motor delay values (13%) in babies referred for an early intervention program[34]. The concern with the early identification of delays, especially language, lies in the greater risk of school difficulties and intelligence levels below the average[35]. Despite the differences in assessment instruments and age between the studies, the field of language seems to demonstrate signs for concern at a very young age; and, once not identified, there can be outcomes in development as a whole, as it was identified in this study in preschoolers and schoolchildren.

The literature points out that the most prevalent language delays were associated with the mother's low schooling and single-parent relationships[36]. Even though this study did not individually control the relative's schooling, in the territory where the NASF is located most of the population is socioeconomically vulnerable, with only a minority having had higher education.

The areas of the MDS whose motor ages had the lowest scores in the children of this study were temporal organization, body scheme, and spatial organization. These results – which represent areas strongly correlated with language and learning development – corroborate those found by Rosa Neto et al.[30], Medina-Papst and Marques[9], Fernani et al.[11], and Mélo, Lucchesi and Signorelli[15].

It is argued that fundamental patterns that govern development, which encompasses the NPMD period until approximately six years old, corresponds to the skill acquisition period when forming the body scheme and spatial organization are necessary, so that, after this age, the acquired patterns are refined[31]. At the age of eight, the notion of body must be matured for application in the written language learning process. Likewise, that of the body scheme, for them to learn notions of space, which will provide the knowledge basis for school activities[9] – which justifies the relationship between psychomotor delays and learning difficulties.

The greater demand of boys with language difficulties and psychomotor delays calls the attention and points to greater risks for males. This agrees with recent studies[37] that identified that the boys' language development occurs later than the girls', besides being at greater risk for delays in language development due to a combination of genetic and environmental factors[37,38]. In biological terms, it is postulated that the boys' greater propensity to delays is due to testosterone since scientists have discovered that the higher levels of this hormone were related to the development of both ASD and language disorders[37].

Reflecting on the issue of flow/demand for this problem identified and screened by the primary care at the NASF, its role in attending these cases should be discussed, as well as its intercommunication with the field of education, including schools and preschools.

In the municipality where the study was conducted there is specialized service offered by secondary care and specialized centers. Nevertheless, these children were on a waiting list for their first screening because the demand for attention is great. This flow process in relation to demand slows down the identification, diagnosis, and intervention strategies. Thus, the groups formed by the NASF in the territory encompassed (currently, four groups) arise as an intervention option to optimize these children's development with transdisciplinary work.

Lopes[39] argues that the family health service should have an essential role in the cases of school complaints, with multiprofessional interventions that go beyond medicalization, from a perspective of professional collaboration, diminishing duplicated care.

The Early Childhood Legal Framework encourages early intervention actions, preferably by six years old[40]. Although they are justified for their focus on the optimal neuroplasticity periods, many cases of delay have been identified late, with consequences on NPMD and school learning[15].

Combined interdisciplinary actions have already proved to be a solution in primary care[21], and should be, thus, given priority for identification and intervention in these children's health care models. This agrees with what Lopes[39] defends as a social/community-oriented work consisting of a professional practice in critical

and creative health that meets the true needs of the community and encourages their empowerment.

The interdisciplinary actions organized by the NASF complies with the child comprehensive health guidelines. They suggest that the professionals at the NASF develop methods and instruments capable of moving their look and practice from the individual to the collective field, in the sense of favoring health within an interdisciplinary work, instead of the systematic practice of referring problems to the specialists. The idea behind these shared actions is that difficulties and solutions be discussed and proposed by the whole team, providing also broadened views and solutions for the problems, according to the possibilities at hand in the health service[41].

Using the MDS[1] as a psychomotor NPMD profile identification and classification instrument, associated with speech-language-hearing assessment, makes screening and identification easier. It also furnishes a systematized method to follow up each child's evolution, as it enables the global profile to be quickly assessed (20 to 30 minutes), with accessible assessment instrument values. It also helps better define cases that can be benefitted by primary care strategies – which are in general milder cases whose intervention can take place in collective actions, different from the more complex and specific cases that require individualized and/or specialized healthcare.

Whenever a demand is identified in a certain territory, the primary healthcare can trace intervention and health promotion strategies to lighten the overload in secondary attention. This does not mean replacing the care offered by the secondary healthcare but presents a support network for both the health services and their users, positively favoring the comprehensive health care. It is also suggested that early interdisciplinary intervention be made to benefit the demands related to promoting child development.

Limitations of this study include the difficulties in organizing the attention given in relation to the demands of the children's comprehensive health. In addition, the families' income was not verified, which is presented here as a suggestion for future studies.

CONCLUSION

It is concluded that most of the children identified by the school only with language delays also have psychomotor delays in other areas, especially in body scheme, and spatial and temporal organization, with negative consequences on their learning process.

This reality observed in relation to the child's integral health ratifies the need for health professionals' multi- and interdisciplinary actions. The NASF stands as an option for longitudinal NPMD follow-up and psychomotor intervention programs.

ACKNOWLEDGMENT

Gratitude is extended to the Vila Garcia Welfare Reference Center (CRAS) for its partnership with the groups.

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