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Original articles

Environmental factors and their associations with speech-language-hearing diagnostic hypotheses in children and adolescents

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ABSTRACT

Purpose: to analyze the associations between speech-language-hearing diagnostic hypotheses in children and adolescents and the Environmental Factors in the International Classification of Functioning, Disability, and Health.

Methods: an observational, analytical, cross-sectional study carried out between 2016 and 2019 in an outpatient center with 5- to 16-year-old children and adolescents undergoing speech-language-hearing assessment and their parents/guardians. The Brazilian Economic Classification Criteria was used, and sociodemographic data were collected, along with speech-language-hearing diagnostic hypotheses and information on the presence of categories of the Environmental Factors, qualified as either barriers or facilitators. Descriptive and association analyses were made, using Pearson's chi-square and Fisher's Exact tests, with the significance level set at 0.05.

Results: most participants had changes in oral language acquisition/development, written language, and oral-motor function. The most prevalent facilitators were in the categories of Services, Systems, and Policies; Support and Relationships; and Products and Technology, whereas the barriers were in the categories of Attitudes; Products and Technology; and Services, Systems, and Policies. The diagnostic hypotheses of "Change in cognitive aspects of language", "Change in speech", and "Change in voice" had a significant association with the codes present in chapters 3 – Support and Relationships, and 4 – Attitudes.

Conclusion: this association shows that patients with communication changes need a comprehensive approach encompassing the Contextual Factors.

Keywords: Speech, Language and Hearing Sciences; International Classification of Functioning, Disability and Health; Child; Adolescent; Social Environment

INTRODUCTION

The need for including external and internal factors in a classification complementary to the International Classification of Diseases (ICD)[1] arose during the process of reviewing the old International Classification of Impairments, Disabilities, and Handicaps (ICIDH), which preceded the International Classification of Functioning, Disability, and Health (ICF)[2]. The discussions involving the social model of disability pointed out that the interventions regarding people with disabilities should also encompass policies, social organization, and the environment[3]. Hence, Part 2 of the ICF addresses the Contextual Factors, which is subdivided into the Environmental Factors and Personal Factors[2].

The Environmental Factors comprise the physical and social environment where people live and their attitudes. Its organization starts on the individual level, encompassing the immediate environment with its physical and material characteristics and the contact with others, and reaches the social level, addressing the formal and informal structures, organizations and services, attitudes and ideologies, and so forth[2]. These factors interact with the components in Part 1 of the ICF and can have either a positive influence (as facilitators) or a negative influence (as barriers). The person's Functioning and Disability is constituted by the active and variable interaction between the health status and the Contextual Factors[2]. This interaction can be examined under the concept of the components of Functioning in the perspectives of the body (disabilities in Functions and Structures), the person (Activity limitation), and the society (Participation restriction). Hence, the disabilities, Activity limitations, and Participation restrictions result from the interaction between the latent predisposition and the environmental barriers[3].

The Environmental Factors are determinants of a person's health status and functioning. Therefore, it has been reported that, in an analysis whose approach is to align the multidirectional and multidimensional ICF model to make it easier to understand, this component could be chosen as the starting point. It would then unfold the following ones in a linear flow while still in the biopsychosocial perspective of the structure *"Environmental Factors -> Personal Factors -> Participation -> Activities -> Body Functions and Structure -> Health Status"*[4]. Hence, we verify how important the Environmental Factors are in the context of the ICF. Studying it is relevant to better understand and characterize the disability and is also associated with international movements whose agenda involve gender issues, reduction of poverty, and development[3]. Moreover, the context plays an essential role in any profession's therapeutic processes and can even be the focus of the intervention aiming to improve aspects of functioning or mediate disability[4].

For a holistic and comprehensive speech-language-hearing approach, even in the assessment process, the therapist must have the Environmental and Personal Factors in mind and address issues related to them, as they can directly influence the functioning of people with communication changes[5]. Using the ICF with this purpose can make it easier to identify the Barriers and Facilitators present in the life of patients in follow-up care and guide the procedures with them when necessary[5].

Further research on the impact of the Environmental and Personal Factors on the life of people with speech-language-hearing disorders is needed[5]. It can raise awareness of their importance, beginning at assessment, particularly regarding populations diagnosed with various speech-language-hearing conditions and in age groups who frequently need secondary health care. Thus, this study aimed at analyzing the associations between speech-language-hearing diagnostic hypotheses in children and adolescents and the Environmental Factors in the ICF.

METHODS

This is an observational, analytical, cross-sectional study approved by the research ethics committee of the *Universidade Federal de Minas Gerais* (Federal University of Minas Gerais – UFMG), Brazil, under evaluation report number 1.174.646. The data were collected between 2016 and 2019 in an outpatient center that is part of the Unified Health System (SUS, in Portuguese) and attends patients coming from various sectors of a hospital complex.

It was carried out with 5- to 16-year-old children and adolescents who were in a speech-language-hearing assessment process and their parents/guardians. Patients diagnosed with hearing loss, intellectual deficit, and global developmental delay (GDD) were excluded from the sample, as these health conditions can cause impairments that may interfere with a more homogeneous data collection.

During the assessment, the participants and their respective parents/guardians were invited to join the study. After they signed both the informed consent and assent forms, the data were collected with analysis of

the structured medical records during the assessment process and the Brazilian Economic Classification Criteria (CCEB, in Portuguese)[6].

The CCEB[6] is an instrument that stratifies the population into social classes ranging from A to D-E, based on household characteristics regarding public services, possessions, and the householder's educational level. It was applied in an interview with the parents/guardians of the children and adolescents in assessment.

The analysis of the medical records provided sociodemographic data regarding age, sex, educational level (both the participants' and their parent's), place of residence, and diagnostic hypotheses established for each case (which could be more than one per patient). Changes in the acquisition/development of oral language, written language, cognitive aspects of language, oral-motor function, voice, auditory processing, and speech were the most prevalent hypotheses in the sample, which were selected to comprise the analyses.

The medical records also provided information to verify the data on the presence of categories of the ICF Environmental Factors, which were listed as described in a previous article[7] and reviewed after the publication of the 2020 ICF version[2]. The qualifiers were used to identify whether the categories present in them were characterized as barriers (.8) or facilitators (+8), thus generating the codes related to the Environmental Factors. Non-described categories were also collected, as they make up the already published initial list developed in the same outpatient center[7].

The speech-language-hearing diagnostic hypotheses were listed as the response variables, while the codes of the Environmental Factors were listed as the explanatory variables. The descriptive analysis of the data was made with the absolute and relative frequency distribution of the categorical variables, as well as the analysis of the measures of central tendency and dispersion of the continuous variables. The association analyses were made with Pearson's chi-square and Fisher's Exact tests, and the statistically significant results were those with a p-value ≤ 0.05. The data were entered, processed, and analyzed with the SPSS software, version 25.0.

RESULTS

The total sample comprised 82 participants, most of them males (72.0%), at the mean age of 9.09±2.69 years (median of 9.00 years); the most prevalent age range was between 8 years and 12 years and 11 months (62.2%). Most patients had not completed middle school (87.7%), most mothers had graduated from high school (61.3%), and most fathers had completed middle school (49.2%). Most of them lived in the metropolitan area (51.2%) and the mean score in the CCEB was 24.59±6.16 points (median 23.00 points) – which, based on the categories of the instrument, concentrated the sample predominantly in class C (70.7%).

The descriptive analysis of the speech-language-hearing diagnostic hypotheses showed that most children and adolescents had "Changes in oral language acquisition/development" (85.4%), "Changes in written language" (74.4%), and "Changes in oral-motor functions" (63.4%). On the other hand, there was a lower frequency of "Change in the cognitive aspects of language" (12.2%), "Change in speech" (13.4%), "Change in auditory processing" (36.6%), and "Change in voice" (42.7%) (Figure 1).

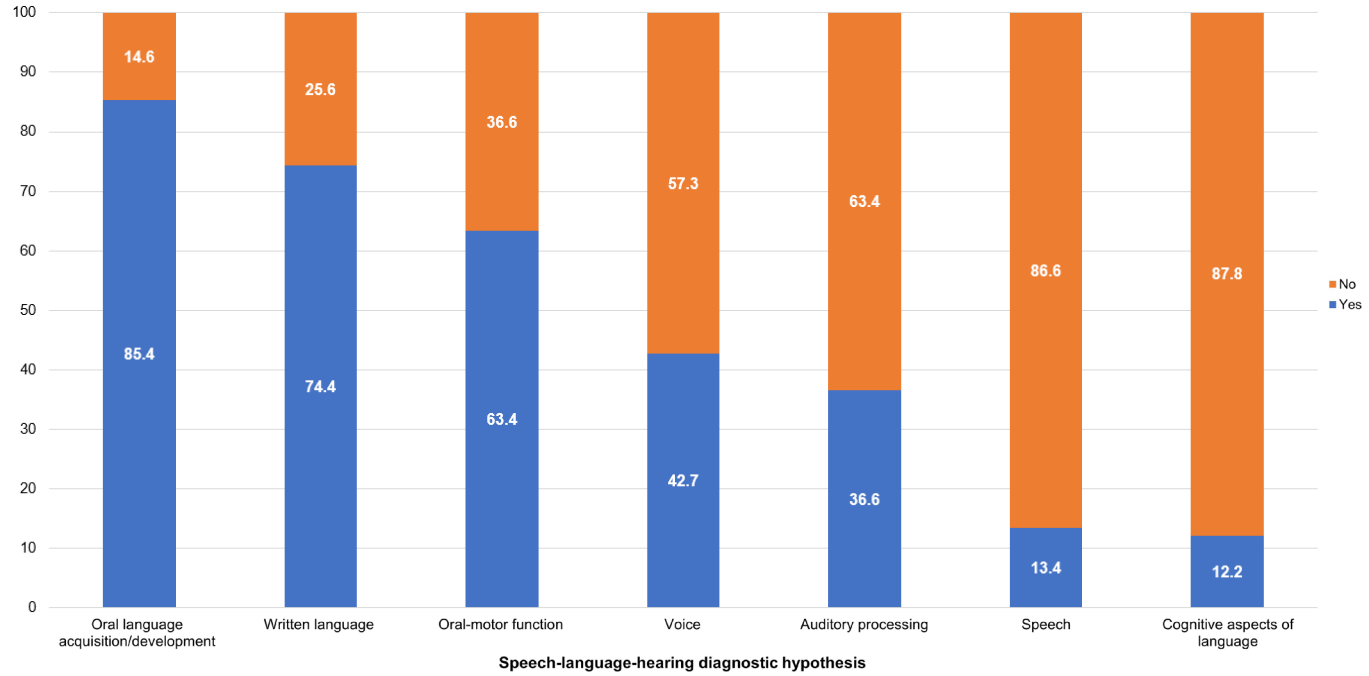

Figure 1. Chart of the distribution of the speech-language-hearing diagnostic hypotheses

Concerning the codes of the Environmental Factors, the descriptive analysis showed that they were predominantly described as facilitators or "not described" in the sample. Codes e530 – Utility Services, Systems, and Policies (100.0%), e310 – Immediate Family (98.8%), e320 – Friends (93.9%), and e140 – Products and Technology for Culture, Recreation, and Sport (92.7%) were the most reported as facilitators. The barriers, on the other hand, were described less often in the data analyzed, although e425 – Individual Attitudes of Acquaintances, Peers, Colleagues, Neighbors, and Community Members (17.1%), e420 – Individual Attitudes of Friends (9.7%), e165 – Assets (8.5%), and e580 – Health Services, Systems, and Policies (8.5%) were the most reported codes.

The analysis of association between the speech-language-hearing diagnostic hypotheses and the codes of the ICF Environmental Factors showed a statistically significant association between "Change in the cognitive aspects of language" and e355 – Health Professionals ($p=0.033$) and e360 – Other Professionals ($p=0.015$) and between "Change in speech" and e360 – Other Professionals ($p=0.020$) (Table 2). There was a statistically significant association between "Change in voice" and e315 – Extended Family ($p=0.001$), and the participants with this change had a trend towards identifying this factor as a facilitator. Also, there was a statistically significant association between "Change in voice" and e410 – Individual Attitudes of Immediate Family Members ($p=0.034$) and e415 – Individual Attitudes of Extended Family Members ($p=0.003$) (Table 3). Code e530 – Utility Services, Systems, and Policies was not included in the association analysis because all participants identified it as a facilitator.

Table 1. Association between the diagnostic hypotheses of "Change in oral language acquisition/development" and "Change in written language" and the Environmental Factors

Categories and Qualifiers in the Environmental Factors	Speech-Language-Hearing Diagnostic Hypothesis					
	Oral Language Acquisition/Development			Written Language		
	Yes N (%)	No N (%)	p-value	Yes N (%)	No N (%)	p-value
e110 – Products or Substances for Personal Consumption						
Not described	31 (44.3)	4 (33.3)		22 (36.1)	13 (61.9)	
It is a barrier	1 (1.4)	0 (0.0)	0.6911	1 (1.6)	0 (0.0)	0.1101
It is a facilitator	38 (54.3)	8 (66.7)		38 (62.3)	13 (61.9)	
Total	70 (100.0)	12 (100.0)		61 (100.0)	21 (100.0)	
e125 – Products and Technology for Communication						
Not described	62 (88.6)	11 (91.7)		53 (86.9)	20 (95.2)	
It is a barrier	1 (1.4)	0 (0.0)	0.9001	1 (1.6)	0 (0.0)	0.5521
It is a facilitator	7 (10.0)	1 (8.3)		7 (11.5)	1 (4.8)	
Total	70 (100.0)	12 (100.0)		61 (100.0)	21 (100.0)	
e130 – Products and Technology for Education						
Not described	22 (31.4)	5 (41.7)		17 (27.9)	10 (47.6)	
It is a barrier	0 (0.0)	0 (0.0)	0.5181	0 (0.0)	0 (0.0)	0.1131
It is a facilitator	48 (68.6)	7 (58.3)		44 (72.1)	11 (52.4)	
Total	70 (100.0)	12 (100.0)		61 (100.0)	21 (100.0)	
e140 – Products and Technology for Culture, Recreation, and Sport						
Not described	5 (7.1)	1 (8.3)		6 (9.8)	0 (0.0)	
It is a barrier	0 (0.0)	0 (0.0)	1.0002	0 (0.0)	0 (0.0)	0.3301
It is a facilitator	65 (92.9)	11 (91.7)		55 (90.2)	21 (100.0)	
Total	70 (100.0)	12 (100.0)		61 (100.0)	21 (100.0)	
e165 – Assets						
Not described	0 (0.0)	0 (0.0)		0 (0.0)	0 (0.0)	
It is a barrier	5 (7.1)	2 (16.7)	0.2712	3 (4.9)	4 (19.0)	0.0672
It is a facilitator	65 (92.9)	10 (83.3)		58 (95.1)	17 (81.0)	
Total	70 (100.0)	12 (100.0)		61 (100.0)	21 (100.0)	
e310 – Immediate Family						
Not described	0 (0.0)	0 (0.0)		0 (0.0)	0 (0.0)	
It is a barrier	1 (1.4)	0 (0.0)	1.0002	1 (1.6)	0 (0.0)	1.0002
It is a facilitator	69 (98.6)	12 (100.0)		60 (98.4)	21 (100.0)	
Total	70 (100.0)	12 (100.0)		61 (100.0)	21 (100.0)	
e315 – Extended Family						
Not described	26 (37.1)	7 (58.3)		21 (34.4)	12 (57.1)	
It is a barrier	0 (0.0)	0 (0.0)	0.1671	0 (0.0)	0 (0.0)	0.0671
It is a facilitator	44 (62.9)	5 (41.7)		40 (65.6)	9 (42.9)	
Total	70 (100.0)	12 (100.0)		61 (100.0)	21 (100.0)	
e320 – Friends						
Not described	2 (2.9)	2 (16.7)		4 (6.6)	0 (0.0)	
It is a barrier	1 (1.4)	0 (0.0)	0.1141	1 (1.6)	0 (0.0)	0.4001
It is a facilitator	67 (95.7)	10 (83.3)		56 (91.8)	21 (100.0)	
Total	70 (100.0)	12 (100.0)		61 (100.0)	21 (100.0)	
e325 – Acquaintances, Peers, Colleagues, Neighbors, and Community Members						
Not described	12 (17.1)	4 (33.3)		9 (14.8)	7 (33.3)	
It is a barrier	1 (1.4)	0 (0.0)	0.4011	1 (1.6)	0 (0.0)	0.1591
It is a facilitator	57 (81.4)	8 (66.7)		51 (83.6)	14 (66.7)	
Total	70 (100.0)	12 (100.0)		61 (100.0)	21 (100.0)	

Categories and Qualifiers in the Environmental Factors	Speech-Language-Hearing Diagnostic Hypothesis					
	Oral Language Acquisition/Development			Written Language		
	Yes N (%)	No N (%)	p-value	Yes N (%)	No N (%)	p-value
e355 – Health Professionals						
Not described	5 (7.1)	2 (16.7)	0.5131	4 (6.6)	3 (14.3)	0.4721
It is a barrier	1 (1.4)	0 (0.0)		1 (1.6)	0 (0.0)	
It is a facilitator	64 (91.4)	10 (83.3)		56 (91.8)	18 (85.7)	
Total	70 (100.0)	12 (100.0)		61 (100.0)	21 (100.0)	
e360 – Other Professionals						
Not described	61 (87.1)	11 (91.7)	0.8671	51 (83.6)	21 (100.0)	0.1411
It is a barrier	1 (1.4)	0 (0.0)		1 (1.6)	0 (0.0)	
It is a facilitator	8 (11.4)	1 (8.3)		9 (14.8)	0 (0.0)	
Total	70 (100.0)	12 (100.0)		61 (100.0)	21 (100.0)	
e410 – Individual Attitudes of Immediate Family Members						
Not described	52 (74.3)	9 (75.0)	0.5841	47 (77.0)	14 (66.7)	0.4731
It is a barrier	5 (7.1)	0 (0.0)		4 (6.6)	1 (4.8)	
It is a facilitator	13 (18.6)	3 (25.0)		10 (16.4)	6 (28.5)	
Total	70 (100.0)	12 (100.0)		61 (100.0)	21 (100.0)	
e415 – Individual Attitudes of Extended Family Members						
Not described	63 (90.0)	10 (83.3)	0.4771	54 (88.6)	19 (90.6)	0.5761
It is a barrier	2 (2.9)	0 (0.0)		1 (1.6)	1 (4.8)	
It is a facilitator	5 (7.1)	2 (16.7)		6 (9.8)	1 (4.8)	
Total	70 (100.0)	12 (100.0)		61 (100.0)	21 (100.0)	
e420 – Individual Attitudes of Friends						
Not described	59 (84.3)	11 (91.7)	0.4101	52 (85.2)	18 (85.7)	0.9991
It is a barrier	8 (11.4)	0 (0.0)		6 (9.8)	2 (9.5)	
It is a facilitator	4 (4.3)	8 (8.3)		3 (4.9)	1 (4.8)	
Total	70 (100.0)	12 (100.0)		61 (100.0)	21 (100.0)	
e425 – Individual Attitudes of Acquaintances, Peers, Colleagues, Neighbors, and Community Members						
Not described	57 (81.4)	11 (91.7)	0.3841	49 (80.3)	19 (90.5)	0.2861
It is a barrier	13 (18.6)	1 (8.3)		12 (19.7)	2 (9.5)	
It is a facilitator	0 (0.0)	0 (0.0)		0 (0.0)	0 (0.0)	
Total	70 (100.0)	12 (100.0)		61 (100.0)	21 (100.0)	
e570 – Social Security Services, Systems, and Policies						
Not described	64 (91.4)	10 (83.3)	0.3831	54 (88.5)	20 (95.2)	0.3711
It is a barrier	0 (0.0)	0 (0.0)		0 (0.0)	0 (0.0)	
It is a facilitator	6 (8.6)	2 (16.7)		7 (11.5)	1 (4.8)	
Total	70 (100.0)	12 (100.0)		61 (100.0)	21 (100.0)	
e580 – Health Services, Systems, and Policies						
Not described	3 (4.2)	0 (0.0)	0.7641	3 (4.9)	0 (0.0)	0.4311
It is a barrier	6 (8.6)	1 (8.3)		6 (9.8)	1 (4.8)	
It is a facilitator	61 (87.1)	11 (91.7)		52 (85.3)	20 (95.2)	
Total	70 (100.0)	12 (100.0)		61 (100.0)	21 (100.0)	

[1]Pearson's chi-square test; [2]Fisher's Exact test
Caption: N= number of subjects

Table 2. Association between the diagnostic hypotheses of "Cognitive aspects of language" and "Change in speech" and the Environmental Factors

Categories and Qualifiers in the Environmental Factors	Speech-Language-Hearing Diagnostic Hypothesis					
	Cognitive Aspects of Language			Change in Speech		
	Yes N (%)	No N (%)	p-value	Yes N (%)	No N (%)	p-value
e110 – Products or Substances for Personal Consumption						
Not described	5 (50.0)	30 (41.7)		5 (45.5)	30 (42.3)	
It is a barrier	0 (0.0)	1 (1.4)	0.8361	0 (0.0)	1 (1.4)	0.9121
It is a facilitator	5 (50.0)	41 (56.9)		6 (54.5)	50 (56.3)	
Total	10 (100.0)	72 (100.0)		11 (100.0)	71 (100.0)	
e125 – Products and Technology for Communication						
Not described	10 (100.0)	63 (87.5)		10 (90.9)	63 (88.7)	
It is a barrier	0 (0.0)	1 (1.4)	0.4961	0 (0.0)	1 (1.4)	0.9201
It is a facilitator	0 (0.0)	8 (11.1)		1 (9.1)	7 (9.9)	
Total	10 (100.0)	72 (100.0)		11 (100.0)	71 (100.0)	
e130 – Products and Technology for Education						
Not described	2 (20.0)	25 (34.7)		3 (27.3)	24 (33.8)	
It is a barrier	0 (0.0)	0 (0.0)	0.4851	0 (0.0)	0 (0.0)	0.6681
It is a facilitator	8 (80.0)	47 (65.3)		8 (72.7)	47 (66.2)	
Total	10 (100.0)	72 (100.0)		11 (100.0)	71 (100.0)	
e140 – Products and Technology for Culture, Recreation, and Sport						
Not described	1 (10.0)	5 (6.9)		1 (9.1)	5 (7.0)	
It is a barrier	0 (0.0)	0 (0.0)	0.5542	0 (0.0)	0 (0.0)	0.8082
It is a facilitator	9 (90.0)	67 (93.1)		10 (90.9)	66 (93.0)	
Total	10 (100.0)	72 (100.0)		11 (100.0)	71 (100.0)	
e165 – Assets						
Not described	0 (0.0)	0 (0.0)		11 (100.0)	64 (90.1)	
It is a barrier	0 (0.0)	7 (9.7)	0.3031	0 (0.0)	7 (9.9)	0.2761
It is a facilitator	10 (100.0)	65 (90.3)		0 (0.0)	0 (0.0)	
Total	10 (100.0)	72 (100.0)		11 (100.0)	71 (100.0)	
e310 – Immediate Family						
Not described	0 (0.0)	0 (0.0)		0 (0.0)	0 (0.0)	
It is a barrier	1 (10.0)	0 (0.0)	0.1222	0 (0.0)	1 (1.4)	1.0002
It is a facilitator	9 (90.0)	72 (100.0)		11 (100.0)	70 (98.6)	
Total	10 (100.0)	72 (100.0)		11 (100.0)	71 (100.0)	
e315 – Extended Family						
Not described	2 (20.0)	31 (43.1)		5 (45.5)	28 (39.4)	
It is a barrier	0 (0.0)	0 (0.0)	0.1641	0 (0.0)	0 (0.0)	0.7051
It is a facilitator	8 (80.0)	41 (56.9)		6 (54.5)	43 (60.6)	
Total	10 (100.0)	72 (100.0)		11 (100.0)	71 (100.0)	
e320 – Friends						
Not described	0 (0.0)	4 (5.6)		0 (0.0)	4 (5.6)	
It is a barrier	0 (0.0)	1 (1.3)	0.6911	0 (0.0)	1 (1.4)	0.6621
It is a facilitator	10 (100.0)	67 (93.1)		11 (100.0)	66 (93.0)	
Total	10 (100.0)	72 (100.0)		11 (100.0)	71 (100.0)	
e325 – Acquaintances, Peers, Colleagues, Neighbors, and Community Members						
Not described	0 (0.0)	16 (22.2)		1 (9.1)	15 (21.1)	
It is a barrier	0 (0.0)	1 (1.4)	0.2261	0 (0.0)	1 (1.4)	0.5831
It is a facilitator	10 (100.0)	55 (76.4)		10 (90.9)	55 (77.5)	
Total	10 (100.0)	72 (100.0)		11 (100.0)	71 (100.0)	

Categories and Qualifiers in the Environmental Factors	Speech-Language-Hearing Diagnostic Hypothesis					
	Cognitive Aspects of Language			Change in Speech		
	Yes N (%)	No N (%)	p-value	Yes N (%)	No N (%)	p-value
e355 – Health Professionals						
Not described	3 (30.0)	4 (5.6)	0.033*1	2 (18.2)	5 (7.0)	0.4411
It is a barrier	0 (0.0)	1 (1.4)		0 (0.0)	1 (1.5)	
It is a facilitator	7 (70.0)	67 (93.0)		9 (81.8)	65 (91.5)	
Total	10 (100.0)	72 (100.0)		11 (100.0)	71 (100.0)	
e360 – Other Professionals						
Not described	9 (90.0)	63 (87.5)	0.015*1	10 (90.9)	62 (87.3)	0.020*1
It is a barrier	1 (10.0)	0 (0.0)		1 (9.1)	0 (0.0)	
It is a facilitator	0 (0.0)	9 (12.5)		0 (0.0)	9 (12.7)	
Total	10 (100.0)	72 (100.0)		11 (100.0)	71 (100.0)	
e410 – Individual Attitudes of Immediate Family Members						
Not described	8 (80.0)	53 (73.6)	0.6501	10 (90.9)	51 (71.8)	0.2091
It is a barrier	1 (10.0)	4 (5.6)		1 (9.1)	4 (5.6)	
It is a facilitator	1 (10.0)	15 (20.8)		0 (0.0)	16 (22.6)	
Total	10 (100.0)	72 (100.0)		11 (100.0)	71 (100.0)	
e415 – Individual Attitudes of Extended Family Members						
Not described	9 (90.0)	64 (88.9)	0.1621	11 (100.0)	62 (87.3)	0.4571
It is a barrier	1 (10.0)	1 (1.4)		0 (0.0)	2 (2.8)	
It is a facilitator	9 (0.0)	7 (9.7)		0 (0.0)	7 (9.9)	
Total	10 (100.0)	72 (100.0)		11 (100.0)	71 (100.0)	
e420 – Individual Attitudes of Friends						
Not described	8 (80.0)	62 (86.1)	0.7221	10 (90.9)	60 (84.5)	0.7151
It is a barrier	1 (10.0)	7 (9.7)		1 (9.1)	7 (9.9)	
It is a facilitator	1 (10.0)	3 (4.2)		0 (0.0)	4 (5.6)	
Total	10 (100.0)	72 (100.0)		11 (100.0)	71 (100.0)	
e425 – Individual Attitudes of Acquaintances, Peers, Colleagues, Neighbors, and Community Members						
Not described	9 (90.0)	59 (81.9)	0.5261	10 (90.9)	58 (81.7)	0.4501
It is a barrier	1 (10.0)	13 (18.1)		1 (9.1)	13 (18.3)	
It is a facilitator	0 (0.0)	0 (0.0)		0 (0.0)	0 (0.0)	
Total	10 (100.0)	72 (100.0)		11 (100.0)	71 (100.0)	
e570 – Social Security Services, Systems, and Policies						
Not described	9 (90.0)	65 (90.3)	0.9781	10 (90.9)	64 (90.1)	0.9361
It is a barrier	0 (0.0)	0 (0.0)		0 (0.0)	0 (0.0)	
It is a facilitator	1 (10.0)	7 (9.7)		1 (9.1)	7 (9.9)	
Total	10 (100.0)	72 (100.0)		11 (100.0)	71 (100.0)	
e580 – Health Services, Systems, and Policies						
Not described	1 (10.0)	2 (2.8)	0.5071	1 (9.1)	2 (2.8)	0.2541
It is a barrier	1 (10.0)	6 (8.3)		2 (18.2)	5 (7.0)	
It is a facilitator	8 (80.0)	64 (88.9)		8 (72.7)	64 (90.1)	
Total	10 (100.0)	72 (100.0)		11 (100.0)	71 (100.0)	

[1]Pearson's chi-square test; [2]Fisher's Exact test
Caption: N= number of subjects; *= $p \leq 0.05$

Table 3. Association between the diagnostic hypotheses of "Change in oral-motor function" and "Change in voice" and the Environmental Factors

Categories and Qualifiers in the Environmental Factors	Speech-Language-Hearing Diagnostic Hypothesis					
	Change in Oral-Motor Function			Change in Voice		
	Yes N (%)	No N (%)	p-value	Yes N (%)	No N (%)	p-value
e110 – Products or Substances for Personal Consumption						
Not described	22 (42.3)	13 (43.3)		17 (48.6)	18 (38.3)	
It is a barrier	1 (1.9)	0 (0.0)	0.7471	0 (0.0)	1 (2.1)	0.4781
It is a facilitator	29 (55.8)	17 (56.7)		18 (51.4)	28 (59.6)	
Total	52 (100.0)	30 (100.0)		35 (100.0)	47 (100.0)	
e125 – Products and Technology for Communication						
Not described	48 (92.3)	25 (83.3)		31 (88.6)	42 (89.4)	
It is a barrier	0 (0.0)	1 (3.3)	0.2831	1 (2.9)	0 (0.0)	0.4891
It is a facilitator	4 (7.7)	4 (13.4)		3 (8.6)	5 (10.6)	
Total	52 (100.0)	30 (100.0)		35 (100.0)	47 (100.0)	
e130 – Products and Technology for Education						
Not described	16 (30.8)	11 (36.7)		11 (31.4)	16 (34.0)	
It is a barrier	0 (0.0)	0 (0.0)	0.5841	0 (0.0)	0 (0.0)	0.8031
It is a facilitator	36 (69.2)	19 (63.3)		24 (68.6)	31 (66.0)	
Total	52 (100.0)	30 (100.0)		35 (100.0)	47 (100.0)	
e140 – Products and Technology for Culture, Recreation, and Sport						
Not described	4 (7.7)	2 (6.7)		1 (2.9)	5 (10.6)	
It is a barrier	0 (0.0)	0 (0.0)	1.0002	0 (0.0)	0 (0.0)	0.2322
It is a facilitator	48 (92.3)	28 (93.3)		34 (97.1)	42 (89.4)	
Total	52 (100.0)	30 (100.0)		35 (100.0)	47 (100.0)	
e165 – Assets						
Not described	0 (0.0)	0 (0.0)		0 (0.0)	0 (0.0)	
It is a barrier	5 (9.6)	2 (6.7)	1.0002	2 (5.7)	5 (10.6)	0.2762
It is a facilitator	47 (90.4)	28 (93.3)		33 (94.3)	42 (89.4)	
Total	52 (100.0)	30 (100.0)		35 (100.0)	47 (100.0)	
e310 – Immediate Family						
Not described	0 (0.0)	0 (0.0)		0 (0.0)	0 (0.0)	
It is a barrier	1 (1.9)	0 (0.0)	1.0002	0 (0.0)	1 (2.1)	1.0002
It is a facilitator	51 (98.1)	30 (100.0)		35 (100.0)	46 (97.6)	
Total	52 (100.0)	30 (100.0)		35 (100.0)	47 (100.0)	
e315 – Extended Family						
Not described	18 (34.6)	15 (50.0)		6 (17.1)	27 (57.4)	
It is a barrier	0 (0.0)	0 (0.0)	0.1711	0 (0.0)	0 (0.0)	0.001*1
It is a facilitator	34 (65.4)	15 (50.0)		29 (82.9)	20 (42.6)	
Total	52 (100.0)	30 (100.0)		35 (100.0)	47 (100.0)	
e320 – Friends						
Not described	2 (3.8)	2 (6.7)		2 (5.7)	2 (4.3)	
It is a barrier	0 (0.0)	1 (3.3)	0.3461	0 (0.0)	1 (2.1)	0.6591
It is a facilitator	50 (96.2)	27 (90.0)		33 (94.3)	44 (93.6)	
Total	52 (100.0)	30 (100.0)		35 (100.0)	47 (100.0)	
e325 – Acquaintances, Peers, Colleagues, Neighbors, and Community Members						
Not described	9 (17.3)	7 (23.3)		6 (17.1)	10 (21.3)	
It is a barrier	0 (0.0)	1 (3.3)	0.3171	1 (2.9)	0 (0.0)	0.4671
It is a facilitator	43 (82.7)	22 (73.4)		28 (80.0)	37 (78.7)	
Total	52 (100.0)	30 (100.0)		35 (100.0)	47 (100.0)	

Categories and Qualifiers in the Environmental Factors	Speech-Language-Hearing Diagnostic Hypothesis					
	Change in Oral-Motor Function			Change in Voice		
	Yes N (%)	No N (%)	p-value	Yes N (%)	No N (%)	p-value
e355 – Health Professionals						
Not described	6 (11.5)	1 (3.3)	0.3181	4 (11.4)	3 (6.4)	0.5061
It is a barrier	1 (1.9)	0 (0.0)		0 (0.0)	1 (2.1)	
It is a facilitator	45 (86.6)	29 (96.7)		31 (88.6)	43 (91.5)	
Total	52 (100.0)	30 (100.0)		35 (100.0)	47 (100.0)	
e360 – Other Professionals						
Not described	46 (88.5)	26 (86.7)	0.6621	32 (91.4)	40 (85.1)	0.5611
It is a barrier	1 (1.9)	0 (0.0)		0 (0.0)	1 (2.1)	
It is a facilitator	5 (9.6)	4 (13.3)		3 (8.6)	6 (12.8)	
Total	52 (100.0)	30 (100.0)		35 (100.0)	47 (100.0)	
e410 – Individual Attitudes of Immediate Family Members						
Not described	37 (71.2)	24 (80.0)	0.6101	21 (60.0)	40 (85.1)	0.034*1
It is a barrier	4 (7.7)	1 (3.3)		3 (8.6)	2 (4.3)	
It is a facilitator	11 (22.1)	5 (16.7)		11 (31.4)	5 (10.6)	
Total	52 (100.0)	30 (100.0)		35 (100.0)	47 (100.0)	
e415 – Individual Attitudes of Extended Family Members						
Not described	45 (86.5)	28 (93.4)	0.4161	28 (80.0)	45 (95.7)	0.003*1
It is a barrier	1 (1.9)	1 (3.3)		0 (0.0)	2 (4.3)	
It is a facilitator	6 (11.6)	1 (3.3)		7 (20.0)	0 (0.0)	
Total	52 (100.0)	30 (100.0)		35 (100.0)	47 (100.0)	
e420 – Individual Attitudes of Friends						
Not described	43 (82.7)	27 (90.0)	0.2971	29 (82.8)	41 (87.3)	0.3981
It is a barrier	5 (9.6)	3 (10.0)		3 (8.6)	5 (10.6)	
It is a facilitator	4 (7.7)	0 (0.0)		3 (8.6)	1 (2.1)	
Total	52 (100.0)	30 (100.0)		35 (100.0)	47 (100.0)	
e425 – Individual Attitudes of Acquaintances, Peers, Colleagues, Neighbors, and Community Members						
Not described	43 (82.7)	25 (83.3)	0.9411	28 (80.0)	40 (85.1)	0.5431
It is a barrier	9 (17.3)	5 (16.7)		7 (20.0)	7 (14.9)	
It is a facilitator	0 (0.0)	0 (0.0)		0 (0.0)	0 (0.0)	
Total	52 (100.0)	30 (100.0)		35 (100.0)	47 (100.0)	
e570 – Social Security Services, Systems, and Policies						
Not described	46 (88.5)	28 (93.3)	0.4741	31 (88.6)	43 (91.5)	0.7182
It is a barrier	0 (0.0)	0 (0.0)		0 (0.0)	0 (0.0)	
It is a facilitator	6 (11.5)	2 (6.7)		4 (11.4)	4 (8.5)	
Total	52 (100.0)	30 (100.0)		35 (100.0)	47 (100.0)	
e580 – Health Services, Systems, and Policies						
Not described	3 (5.8)	0 (0.0)	0.3921	2 (5.7)	1 (2.1)	0.6921
It is a barrier	4 (7.7)	3 (10.0)		3 (8.6)	4 (8.5)	
It is a facilitator	45 (86.5)	27 (90.0)		30 (85.7)	42 (89.4)	
Total	52 (100.0)	30 (100.0)		35 (100.0)	47 (100.0)	

[1]Pearson's chi-square test; [2]Fisher's Exact test
Caption: N= number of subjects; *= p≤0.05

Table 4. Association between the diagnostic hypothesis of "Change in auditory processing" and the Environmental Factors

Categories and Qualifiers in the Environmental Factors	Speech-Language-Hearing Diagnostic Hypothesis		
	Change in Auditory Processing		
	Yes N (%)	No N (%)	p-value
e110 – Products or Substances for Personal Consumption			
Not described	11 (36.7)	24 (46.2)	0.4921
It is a barrier	0 (0.0)	1 (1.9)	
It is a facilitator	19 (63.3)	27 (51.9)	
Total	30 (100.0)	52 (100.0)	
e125 – Products and Technology for Communication			
Not described	26 (86.7)	47 (90.4)	0.4141
It is a barrier	1 (3.3)	0 (0.0)	
It is a facilitator	3 (10.0)	5 (9.6)	
Total	30 (100.0)	52 (100.0)	
e130 – Products and Technology for Education			
Not described	9 (30.0)	18 (34.6)	0.6681
It is a barrier	0 (0.0)	0 (0.0)	
It is a facilitator	21 (70.0)	34 (65.4)	
Total	30 (100.0)	52 (100.0)	
e140 – Products and Technology for Culture, Recreation, and Sport			
Not described	2 (6.7)	4 (7.7)	1.0002
It is a barrier	0 (0.0)	0 (0.0)	
It is a facilitator	28 (93.3)	48 (92.3)	
Total	30 (100.0)	52 (100.0)	
e165 – Assets			
Not described	0 (0.0)	0 (0.0)	1.0002
It is a barrier	2 (6.7)	5 (9.6)	
It is a facilitator	28 (93.3)	47 (90.4)	
Total	30 (100.0)	52 (100.0)	
e310 – Immediate Family			
Not described	0 (0.0)	0 (0.0)	0.3662
It is a barrier	1 (3.3)	0 (0.0)	
It is a facilitator	29 (96.7)	52 (100.0)	
Total	30 (100.0)	52 (100.0)	
e315 – Extended Family			
Not described	10 (33.3)	23 (44.2)	0.3601
It is a barrier	0 (0.0)	0 (0.0)	
It is a facilitator	20 (66.7)	29 (55.8)	
Total	30 (100.0)	52 (100.0)	
e320 – Friends			
Not described	0 (0.0)	4 (7.7)	0.2151
It is a barrier	0 (0.0)	1 (1.9)	
It is a facilitator	30 (100.0)	47 (90.4)	
Total	30 (100.0)	52 (100.0)	
e325 – Acquaintances, Peers, Colleagues, Neighbors, and Community Members			
Not described	3 (10.0)	13 (25.0)	0.1771
It is a barrier	0 (0.0)	1 (1.9)	
It is a facilitator	27 (90.0)	38 (73.1)	
Total	30 (100.0)	52 (100.0)	
e355 – Health Professionals			
Not described	3 (10.0)	4 (7.7)	0.7061
It is a barrier	0 (0.0)	1 (1.9)	
It is a facilitator	27 (90.0)	47 (90.4)	
Total	30 (100.0)	52 (100.0)	

Categories and Qualifiers in the Environmental Factors	Speech-Language-Hearing Diagnostic Hypothesis		
	Change in Auditory Processing		
	Yes N (%)	No N (%)	p-value
e360 – Other Professionals			
Not described	25 (83.3)	47 (90.4)	0.3531
It is a barrier	1 (3.3)	0 (0.0)	
It is a facilitator	4 (13.4)	5 (9.6)	
Total	30 (100.0)	52 (100.0)	
e410 – Individual Attitudes of Immediate Family Members			
Not described	24 (80.0)	37 (71.2)	0.6101
It is a barrier	1 (3.3)	4 (7.7)	
It is a facilitator	5 (16.7)	11 (22.1)	
Total	30 (100.0)	52 (100.0)	
e415 – Individual Attitudes of Extended Family Members			
Not described	27 (90.0)	46 (88.5)	0.8381
It is a barrier	1 (3.3)	1 (1.9)	
It is a facilitator	2 (6.7)	5 (9.6)	
Total	30 (100.0)	52 (100.0)	
e420 – Individual Attitudes of Friends			
Not described	25 (83.3)	45 (86.5)	0.8451
It is a barrier	3 (10.0)	5 (9.7)	
It is a facilitator	2 (6.7)	2 (3.8)	
Total	30 (100.0)	52 (100.0)	
e425 – Individual Attitudes of Acquaintances, Peers, Colleagues, Neighbors, and Community Members			
Not described	24 (80.0)	44 (84.6)	0.7621
It is a barrier	6 (20.0)	8 (15.4)	
It is a facilitator	0 (0.0)	0 (0.0)	
Total	30 (100.0)	52 (100.0)	
e570 – Social Security Services, Systems, and Policies			
Not described	26 (86.7)	48 (92.3)	0.4552
It is a barrier	0 (0.0)	0 (0.0)	
It is a facilitator	4 (13.3)	4 (7.7)	
Total	30 (100.0)	52 (100.0)	
e580 – Health Services, Systems, and Policies			
Not described	0 (0.0)	3 (5.8)	0.3921
It is a barrier	3 (10.0)	4 (7.7)	
It is a facilitator	27 (90.0)	45 (86.5)	
Total	30 (100.0)	52 (100.0)	

[1]Pearson's chi-square test; [2]Fisher's Exact test
Caption: N= number of subjects

DISCUSSION

Even though the Personal Factors were not included in the objective of this study, aspects related to them were addressed in the sample's sociodemographic data. Most participants were males, aged 8 years to 12 years and 11 months, and attended elementary or middle school. A similar result, regarding both the predominance of males and the age group, was verified in research with 60 children and adolescents aged 4 to 16 years, divided into two groups – one with changes in speech (stuttering and phonological changes) and the other with typical speech development[8]. Another characteristic of the present sample was the predominance of "Changes in oral language acquisition/development", "Changes in written language", and "Changes in oral-motor function". This result did not corroborate a previous study conducted in the same setting, though at a different time and with a different sample, which verified a greater prevalence of "Changes in oral language", "Changes in cognitive aspects of language", and "Changes in oral-motor function"[7]. This difference – i.e., the higher occurrence of changes in written language instead of the cognitive aspects of language (the least prevalent hypotheses in the present study) – may be due to this sample's age, which ranged from 5 to 16 years old and did not include participants from 1 month to 4 years and 11 months old, as the previous study had included.

In the present study, the categories whose qualifiers were predominantly seen as facilitators referred to the ICF chapters of Services, Systems, and Policies; Support and Relationships; and Products and Technology[2]. These results are due to sanitation services provided to their homes, the presence of people such as the parents, siblings, grandparents, and friends, and the access to recreational and sports equipment. As for those described as barriers, most belonged to the chapter on Attitudes, followed by Products and Technology, and Services, Systems, and Policies[2]. They were present because of opinions and beliefs regarding the patients' communication problems and difficult access to financial and material assets and health services. A systematic review of the literature verified that, in the studies with children and adolescents with neurological conditions, the Environmental Factors played an important role in the expression of functioning and disability. It highlighted findings related to the use of assistive technology equipment at home, physical access in the environment, need for support from specialized professionals and services, and presence of friends and immediate family[9].

A study conducted in Japan using the Delphi technique with parents, health professionals, and teachers aimed to establish what environment structure would benefit the well-being of children with intellectual disabilities. It found the following five items common to the three groups of participants: attitudes of the family members at home; attitude of teachers and health professionals; support from family members at home; support at school (from peers and teachers); and government policies[10]. These results are similar to the categories that stood out in the present study for their prevalence as either a facilitator (e530 – Utilities Services, Systems, and Policies; e310 – Immediate Family; e320 – Friends) or a barrier (e580 – Health Services, Systems, and Policies), or for having a statistically significant association with the response variables regarding the speech-language-hearing changes (e355 – Health Professionals; e360 – Other Professionals; e410 – Individual Attitudes of Immediate Family Members). The authors also highlighted the importance of valuing the children's opinions when they can be collected[10]. In the present study, although the medical history was surveyed with the parents/guardians during the speech-language-hearing assessment, the participants also had the opportunity to express themselves whenever they wanted. Their impressions were often recorded, especially regarding the support they get and the attitude of others toward them.

The Environmental Factors were present in studies regarding Speech-Language-Hearing Sciences and the ICF[8,11,12]. This was the case of one of the construction stages of a checklist in a Specialized Rehabilitation Center in the state of São Paulo[11], whose departments of Home Assistance, Neurology Multidisciplinary Team, and Child Speech-Language-Hearing Therapy provide speech-language-hearing services. One of the questions proposed to the teams to guide the structuring of the checklist was: "What Environmental Factors (e) – access to equipment, medications, prostheses, relatives, caregivers, work, employment, social life, etc. – impact my practice?". They also proposed that, as in the present study, .8 be used as a qualifier (not specified). As a result, the categories selected in the Department of Child Speech-Language-Hearing Therapy were e330 – People in Position of Authority, considered a facilitator; e410 – Individual Attitudes of Immediate Family Members, predominantly considered a facilitator; e415 – Individuals Attitudes

of Extended Family Members, seen mostly as either neutral or a barrier; e420 – Individual Attitudes of Friends, assessed by most as a facilitator; and e355 – Health Professionals, also verified as a facilitator[11]. All these categories, except for e330, were likewise assessed in the present study. Despite the different scenarios – a specialized center (which counts with multiprofessional attention) and an outpatient center (which integrates a reference hospital) –, the similarities in the listed categories indicate their relevance to children. As for e360 – Other Professionals, also found in the present study, it was described only in the Home Speech-Language-Hearing Assistance checklist[11], in which the speech-language-hearing therapists share their visits with other professionals. The setting of the present study does not count with either home attention services or shared health care. Nevertheless, the patients who need speech-language-hearing assessment are always referred by other professionals from the same health care complex.

A study with 30 children who used cochlear implants obtained seven categories of Environmental Factors. Its reference was the ICF-CY[13], following the protocols routinely used in the service where the research took place, as well as information available in the medical record of the speech-language-hearing therapists and other professionals, such as the social workers and psychologists. When the corresponding qualifiers were included, most related codes functioned as facilitators to the participants[12] – which was also observed in the present study. However, the present sample comprised participants with various complaints in the many fields of speech-language-hearing pathology, differently from the study that focused on cochlear implant users[12] – which explains the difference between the number of categories selected in that study and the present one. Another different point is codes e250 – Sound and e130 – Products and Technology for Education deemed as barriers in relation to the use of frequency modulation systems (FM)[12] – which is also related to the profile of the sample researched, differently from the present article.

Furthermore, in a group of children and adolescents with changes in speech being followed up at a speech-language-hearing teaching clinic, the most impaired categories were e410 – Individual Attitudes of Immediate Family Members and e425 – Individual Attitudes of Acquaintances, Peers, Colleagues, Neighbors, and Community Members. Some of them even reported feeling sad when asked about the relatives' attitudes toward their speech difficulties[8]. As in the present study, the individual attitudes of friends and acquaintances (e420, e425) were also mostly classified as barriers. The authors described some attitudes reported as barriers, such as the little conversation between parents and children, the habit of correcting the participants' speech, saying they were not speaking correctly, and so forth. On the other hand, they described some facilitators, especially the friends' attitudes, who waited for the child/adolescent to speak, invited them to play, and listened to the participants' everyday stories[8]. The results of both studies show how important physical and emotional support is in cases of communication changes, whereas other people's attitudes can directly and negatively influence the children and adolescents who have such issues. Thus, the therapist must have an approach to guide the communicating peers and minimize such barriers.

The analyses made in the present study revealed statistically significant associations between "Change in the cognitive aspects of language" and e355 – Health Professionals and e360 – Other Professionals; between "Change in speech" and e360 – Other Professionals; and between "Change in speech" and e315 – Extended Family, e410 – Individual Attitudes of Immediate Family Members, and e415 – Individual Attitudes of Extended Family Members. The speech-language-hearing diagnoses are based on assessments that focus on Body Functions and Structures and Activities and Participation. Hence, the study results reinforced that there is an association between components of functioning and disability and the Environmental Factors. It must also be emphasized that the Contextual Factors are determinants in the analysis of the Performance qualifier in Activities and Participation[2]. Another point substantiated in this study is the influence of Environmental Factors on communication disorders, which requires speech-language-hearing therapists to routinely include these factors in their clinical practice in order to have a comprehensive approach to optimize the communicative function of the patient in follow-up[5].

Code e355 – Health Professionals, which is predominantly a facilitator, was associated with "Change in cognitive aspects of language"; however, no similar analyses were found in the literature. It can be inferred that such a result was obtained because the patients had begun follow-up and may therefore have found support to cope with their speech-language-hearing condition. In a broader examination, including the occurrence of disabilities, the professionals have moral

and ethical responsibility regarding inclusive environments. They must be attentive to and coordinate actions regarding the existence of environmental barriers, as they are in a favorable position to promote changes that can enhance well-being and inclusion[14]. Hence, health professionals have an important role in the life of patients with speech-language-hearing changes, regardless of its type and their stage in life.

In the present study, "Other professionals" encompassed the education ones, including the assistant teachers and tutors, whose amount of support was relevant to the participants. A systematic review[15] aimed to identify what Environmental and Psychosocial Factors were associated with participation, as well as the contexts, mechanisms, and results that also interfered with it in children 4 to 12 years old with disabilities. It verified that the "adults" – the term used to refer to teachers and other school employees – played essential roles in creating opportunities for participation. The literature points out that the adults' positive attitudes were facilitators of participation; on the other hand, they also played an important role in providing fewer opportunities of participation when, for instance, they "classified" the children with disabilities as less capable[15]. The associations verified in the present study between e360 – Other Professionals and "Change in cognitive aspects of language" and "Change in speech" corroborate these reports concerning the importance of the presence of "Other Professionals" in the life of children and adolescents with speech-language-hearing needs.

The significance between e315 – Extended Family and "Change in voice" and the participants' trend toward qualifying it as a facilitator show that the presence and support of the extended family were essential in their communication condition. Hence, help from different people can also be seen as a positive compensation strategy[16]. In the ICF, Chapter 3 – Support and Relationships encompasses people who give physical, emotional, practical, protective, and assistive support, and other types, as well. In this regard, the Extended Family comprises the blood relatives, in-laws, and other relationships, such as uncles, aunts, and cousins[2]. Good relationship opportunities in the first years of life give the child a context with values, cognitive skills, and sociability in a stage that involves maturational processes and social and affective learning[17]. When they are well-established, emotional exchanges in the family context are essential to their development and the acquisition of conditions crucial to each development stage. Moreover, the norms and principles lived within a home tend to remain throughout life[18].

In the present study, there was a statistical significance between e410 – Individual Attitudes of Immediate Family Members and e415 – Individual Attitudes of Extended Family Members with "Change in voice". Chapter 4 – Attitudes classifies the attitudes of people external to those that have their issues described with the ICF codes, as they influence both their individual behavior and social life at various levels[2]. Other peoples' negative attitudes can hinder the participation of those who have communication disorders[5], and even the child's or adolescent's family may have attitudes that do not take their particularities into account, detailing their difficulties and consequently causing losses to their health care and barriers to their development[19]. It has been verified in a previous study that the individual attitudes of relatives, friends, and acquaintances (e410, e420, e425) were associated with the presence of barriers in a group of children and adolescents with speech changes. They were pointed out as a factor that hindered various relationships in that population, whose routine became more difficult. Moreover, the participants reported that being in environments together with people with these attitudes may cause difficulties coping with stress, limiting the participation of those with speech changes[8]. The findings in the present study corroborate this information in that they indicate to what extent attitudes external to the patient can influence those with speech-language-hearing diagnoses. In the context of rehabilitation, the professional must raise the relatives' awareness of their role, which can help them develop more positive attitudes in dealing with those who have communication disorders[5]. Integrating relatives this way in the therapeutic process indicates how much their attitudes toward the child or adolescent bring about change, broadening the look (initially focused on organic aspects) to the person and the care for them[19].

The limitations of this study include the high prevalence of "Not described" categories, which may have prevented the identification of other associations between the variables studied. However, these categories were maintained in the analysis because they are relevant to children and adolescents who are undergoing speech-language-hearing assessments. They had a considerable prevalence in a previous analysis made in the same setting of this study, based on the same protocol used in the present sample. This

indicates that, though not verified in the present result, they were expected and may occur in other samples. Another limitation was the difficulty handling the data on second-level categories to make possible an analysis of more robust statistical models. Nonetheless, the results found are important, given the scarcity of speech-language-hearing literature focused on Environmental Factors and their associations with communication changes. Therefore, it is suggested that future studies give priority to making multivariate analyses.

One potentiality of the study stands out, which is that few publications focus exclusively on the Environmental Factors, despite this component's great importance within the structure proposed in the ICF. They are essential to determine the extent of a disability and the means to mediate it. Moreover, when an environment manages to fully embrace a disability, it may stop being experienced as such[14]. Further scarce is the focus on associations between the ICF Environmental Factors and the speech-language-hearing changes. Studying the Environmental Factors more in depth can furnish important information on the contexts in which the functioning and disability of patients in speech-language-hearing follow-up take place. Hence, the care provided to them may consequently have greater gain, affecting the functioning as a whole and broadening and diversifying the parental educational actions. This provides comprehensive intervention actions and a biopsychosocial view of the subjects with communication disorders.

CONCLUSION

An association was found between the diagnostic hypotheses of "Change in cognitive aspects of language", "Change in speech", and "Change in voice" and the codes of the ICF Environmental Factors present in Chapters 3 – Support and Relationships and 4 – Attitudes. This result shows the importance of a comprehensive approach to patients with communication changes. It should go beyond organic issues and include, as one of its goals, the work with peers and people close to the patient, also assessing to what extent the environment can be a determinant of a successful speech-language-hearing intervention process. Using the ICF proves to be greatly important to thoroughly describe health conditions in a diagnostic process, focusing on a biopsychosocial view of people.

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