

Referred speech-language and hearing complaints in the western region of São Paulo, Brazil

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OBJECTIVE: The aim of this study was to characterize the epidemiological profile of the population attending primary health care units in the western region of the city of São Paulo, Brazil, highlighting referred speech-language and hearing complaints.

METHOD: This investigation was a cross-sectional observational study conducted in primary health care units. Household surveys were conducted and information was obtained from approximately 2602 individuals, including (but not limited to) data related to education, family income, health issues, access to public services and access to health services. The speech-language and hearing complaints were identified from specific questions.

RESULTS: Our results revealed that the populations participating in the survey were heterogeneous in terms of their demographic and economic characteristics. The prevalence of referred speech-language and hearing complaints in this population was 10%, and only half the users of the public health system in the studied region who had complaints were monitored or received specific treatment.

CONCLUSIONS: The results demonstrate the importance of using population surveys to identify speech-language and hearing complaints at the level of primary health care. Moreover, these findings highlight the need to reorganize the speech-language pathology and audiology service in the western region of São Paulo, as well as the need to improve the Family Health Strategy in areas that do not have a complete coverage, in order to expand and improve the territorial diagnostics and the speech-language pathology and audiology actions related to the prevention, identification, and rehabilitation of human communication disorders.

KEYWORDS: Primary Health Care; Speech-Language Pathology; Hearing Disorders; Community Survey; Family Health.

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INTRODUCTION

Studies have shown that it is important that clinicians, researchers, and administrators in health care know the prevalence, incidence, and risk factors for a particular disease in the community in order to allocate sufficient resources to manage the problems associated with that disease and to promote actions with a major impact on population health. Epidemiology can help speech-language pathologists identify the risks for the occurrence of communication disorders in a given population, as well as

the need for professional education and for changes in health services (1,2).

One of the most widely used instruments for the formulation and evaluation of public policies is population surveys (3,4). This type of survey makes it possible to determine the health profile and the distribution of risk factors in a population (3) and to correlate injuries and health problems with socio-environmental conditions and even with perceived health status, thereby enabling the identification of health inequalities related to disease occurrence and to risk exposure. Individuals with less severe or mildly symptomatic health problems, as well as groups with limited access to health services, can also be identified through health surveys (3,5-7).

Epidemiologic survey studies often use self-reported data to assess the presence of diseases and disorders (8). Similarly, many studies have aimed to assess the accuracy of self-reported disorders, to estimate the prevalence of these disorders (9,10) and to facilitate the correct assessment

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and early diagnosis and treatment (11). Estimates of disease prevalence based on self-reported complaints have the advantage of rapid obtainment of the information and low cost, enabling the adoption of this approach in large populations (12). Studies suggest that prevalence data obtained from self-reported surveys are trustworthy (13).

Although there is some restriction in using self-reported complaints obtained from surveys, based on the idea that this type of information is nonspecific and imprecise, the comparisons made between the reported prevalence of diseases and health self-assessment, as well as the restriction of daily activities, allow the conclusion that this information can be used (14). Some types of complaints may even be considered as a diagnostic criterion (15).

The aim of this study was to characterize the epidemiological profile of the population attending primary health care units (Unidades Básicas de Saúde – UBS) and a School Health Center (Centro de Saúde Escola – CSE) in the western region of São Paulo City, Brazil, highlighting referred speech-language and hearing complaints.

■ MATERIALS AND METHODS

The present investigation was a cross-sectional observational study developed as part of the project PET-Saúde USP and conducted in health care units of the primary health care network of the West Region of São Paulo, Brazil, linked to the Family Health Strategy. The University of São Paulo develops academic and health care activities in these units in partnership with the Municipal Health Secretariat. This study was approved by the Research Ethics Committee of the Municipal Health Secretariat of São Paulo (Process CAAE SMS no. 0177.0.162.000-10) and all subjects signed their informed consent authorizing the use of personal health information for research.

Subjects of both genders attending the UBS São Jorge, Vila Dalva, Jardim Boa Vista, and Centro de saúde-escola Samuel B. Pessoa in 2009 (Group 1, $n=1284$) and the UBS Paulo VI and Jd. D'Abril in 2010 (Group 2, $n=1318$) were randomly selected. The surveys were administered in 685 households (338 households in Group 1 and 347 in Group 2), corresponding to 685 families. Four individuals, on average, lived in each household. Ultimately, 2602 people responded to the surveys.

Household surveys were conducted by 78 students (PET-Saúde fellows) from undergraduate courses in Speech-Language Pathology and Audiology, Physical Education, Nursing, Pharmacy, Physiotherapy, Medicine, Nutrition, Occupational Therapy, and Dentistry at the University of São Paulo, together with Community Health Workers (Agentes Comunitários de Saúde – ACSs) who work in the services selected for this study. The students were divided into groups of three and each group was accompanied by an ACS. Surveys were conducted weekly for 12 months, for community health needs assessment. Information about the territory; the services used by the population; the accessibility to health services; and demographic, socioeconomic, and epidemiological data was collected. The instrument was developed in the undergraduate courses that participated in PET-Saúde 2009.

The information collected referred to the profile of residents in the studied areas and their households, including data related to education, family income, health issues, access to public services (water supply, electricity, basic sanitation, sewerage and waste collection), access to health services, and

telephone services, among other factors. The speech-language and hearing complaints were identified from specific questions on the survey, within the Functionality area. Specific questions directed at speech-language and hearing complaints were as follows: “Does any family member have difficulty speaking?” and “Does any family member have difficulty hearing?” Furthermore, the reasons for the complaints and the occurrence of specific monitoring for these conditions were investigated. Regarding the individuals who reported speech/language and hearing complaints, it is noteworthy that these conditions were considered two separate complaints (i.e., a hearing complaint plus a speech/language complaint was counted as two different complaints). The subjects who reported speech-language and/or hearing complaints and were not in therapy were referred for a full clinical assessment at the university.

During the development of the instrument, the necessity of including a question regarding reading and writing complaints was discussed. However, those complaints may be easily confounded with problems related to literacy. Consequently, it was decided not to draft any questions related to reading and writing complaints; therefore, the speech/language complaints were not overestimated.

Furthermore, to verify the correlation between referred complaints and diagnostic hypotheses related to speech, language and hearing, subjects who reported complaints were invited to participate in a full clinical assessment at the university. The subjects were assessed by the ABFW screening protocol, which was adapted from ABFW (16) and contained phonological, fluency, lexical, semantic, pragmatic, hearing, voice and orofacial motricity tests.

Upon completion of the surveys, the data were tabulated and analyzed. The data were statistically analyzed by chi-square and Kruskal-Wallis tests and the Kappa coefficient, with a significance level of 5%.

■ RESULTS

In this study, 2602 individuals of both genders were evaluated. Females with ages ranging from 0 to 92 years comprised 53.99% of the sample. More than 55% (56.23%, $n=1463$) of the individuals were aged between 30 and 69 years (Table 1).

Regarding the level of education, most of the subjects participating in this study had not completed elementary school and approximately 5% of the studied population was illiterate (Table 2).

We observed that most of the population had access to public services, but the access to electricity, sewerage and waste collection differed significantly between Groups 1 and 2 (Table 3). A significant difference in telephone usage was also observed between the groups (Table 3).

With regard to health services use among the individuals living in the studied areas, we observed that most users of UBS São Jorge, Vila Dalva, Jd. Boa Vista, and Samuel B. Pessoa (Group 1) used these health services when necessary, while only 21% of users of UBS Jd. D'Abril and Paulo VI (Group 2) used these health services (Table 4).

Approximately 10% of the total population ($n=261$) reported some type of speech-language and hearing complaint. Approximately 6.5% ($n=169$) of the complaints were related to changes in speech, language and swallowing, and 3.6% ($n=92$) were specifically related to hearing. Referred speech-language and hearing complaints were

**Table 1** - Characterization of the population by gender and age (n = 2602).

Group 1	Gender		Age				
	Male	Female	<20 years	20-29 years	30-49 years	50-69 years	>70 years
n	537	747	37	174	560	394	119
%	41.82	58.18	2.89	13.55	43.61	30.68	9.27
Total	1284		1284				

Group 2	Gender		Age				
	Male	Female	<20 years	20-29 years	30-49 years	50-69 years	>70 years
n	660	658	517	217	310	199	75
%	50.07	49.93	39.22	16.46	23.52	15.10	5.70
Total	1318		1318				

Gender: Chi-square test – $p < 0.001$; Age-range: Kruskal-Wallis test – $p = 0.406$.

Table 2 - Characterization of the population with respect to education.

Education	Group 1		Group 2	
	(%)	n	(%)	n
Illiterate	5.8	74	5	66
Incomplete primary education	38.5	495	41.4	546
Complete primary education	8.6	110	8.6	113
Incomplete secondary education	10.2	131	9	119
Complete secondary education	18.9	242	15.4	203
Incomplete higher education	2.7	35	2.3	30
Complete higher education	2.5	32	3.4	45
Under 14 years out of school	1.2	15	0.6	8
Not applicable	9.2	119	12.1	159
Do not know	2.4	31	2.2	29
N total	100	1284	100	1318

Kruskal-Wallis test: $p = 0.437$.

more significant in the UBS most sought by the users (Group 1). In addition, complaints were more frequent in the 50–69 year age group in both regions studied (Table 5).

Considering the age range, the analysis of speech-language and hearing complaints led to the following picture:

a) Prevalence of speech-language complaints (speech, language, and swallowing) by age range:

a.1) Group 1: under 20 years old, 5.4%; 20–29 years old, 7.74%; 30–49 years old, 7.32%; 50–69 years old, 13.45%; over 70 years old, 1.68%;

a.2) Group 2: under 20 years old, 4.64%; 20–29 years old, 1.38%; 30–49 years old, 1.93%; 50–69 years old, 2.51%; over 70 years old, 2.66%.

b) Prevalence of hearing complaints by age range:

b.1) Group 1: under 20 years old, 0%; 20–29 years old, 0.57%; 30–49 years old, 2.85%; 50–69 years old, 6.34%; over 70 years old, 14.28%;

b.2) Group 2: under 20 years old, 1.35%; 20–29 years old, 1.38%; 30–49 years old, 1.29%; 50–69 years old, 6.53%; over 70 years old, 8%.

Only 23.75% of individuals who reported speech-language and hearing complaints were monitored in health services (Table 6).

To verify the correlation between the referred complaints and the diagnostic hypotheses, subjects who reported complaints were invited to participate in a full clinical assessment at the university. Ultimately, approximately 200 subjects were invited because 61 could not be contacted. Of these individuals, 111 attended and completed the evaluation.

Of the 111 subjects evaluated, 66.46% were male and 33.54% were female. In the age group distribution, we obtained the following results: 18.91% subjects aged up to 19 years; 9.9% aged from 20–29 years; 15.31% aged from 30–49 years; 28.82% aged from 50–69 years, and 27.02% aged over 70 years.

To verify the correlation between the complaints and the diagnostic hypothesis obtained after the complete clinical assessment of 111 individuals, we calculated the Kappa coefficient. The measure of agreement between the diagnostic hypothesis and the referred complaints was 0.70, with a confidence interval of 0.59 - 0.80.

■ DISCUSSION

In this study, we conducted a population survey to characterize the epidemiological profile of the population

Table 3 - Population's access to basic services of water supply, electricity, sewerage, waste collection and telephone.

	Group 1				Group 2				p-value
	Yes		No		Yes		No		
	%	n	%	n	%	n	%	n	
Water	99.1	1272	0.9	12	99.1	1306	0.9	12	0.948
Electricity	98.3	1262	1.7	22	71.1	937	28.9	381	<0.001*
Sewerage	89.8	1153	10.2	131	70.52	929	29.48	389	<0.001*
Waste collection	90.0	1156	10.0	128	80.92	1066	19.08	252	<0.001*
Telephone	67.3	864	32.7	420	41.61	548	58.39	770	<0.001*
Total (n)	1284				1318				

Chi-square test.



Table 4 - Population's access to health services.

Services sought in case of illness	Group 1		Group 2		p-value
	Yes (%)	No (%)	Yes (%)	No (%)	
UBS	88	12	20.94	79.06	<0.001*
University Hospital USP	68.1	31.9	14.95	85.05	<0.001*
AMA	14.3	85.7	9.89	90.11	0.369
ER Bandeirantes	11.4	88.6	2.23	97.77	0.009*
Sarah Hospital	9.7	90.3	1.01	98.99	0.01*
Pharmacy	4	96	1.37	98.63	0.178
Church	8.8	91.2	0.14	99.86	0.009*
Hospital/clinics private/health insurance	15.3	84.7	4.91	95.09	0.007*
HCFMUSP	15.9	84.1	1.66	98.34	0.0002*

Chi-square test. Legend: UBS – Primary care health units; USP – University of São Paulo; AMA – Ambulatory medical care; HCFMUSP – Clinics Hospital of the Faculty of Medicine of the University of São Paulo.

attending primary health care units in the western region of the city of São Paulo, Brazil, emphasizing the referred speech-language and hearing complaints.

Studies have shown that the early identification of developmental speech and language disorders reduces by approximately 30% the necessity for therapeutic monitoring in middle childhood (17,18). Moreover, instruments based on information collected from parents of children with hearing difficulties have been shown to improve their awareness of the problem and to increase their motivation to access appropriate health information and health care (19).

Our results show that the populations participating in the survey in 2009 and 2010 were heterogeneous in terms of their demographic and economic characteristics. The population attending the UBS Jd. D'Abril and Paulo VI has the greatest need in terms of education and access to basic public and health services. Moreover, we found the lowest prevalence of referred speech-language and hearing complaints for this population. This fact most likely is associated with the greater scarcity of resources in the areas covered by these health care units, which may limit the population's knowledge about health, thereby reducing the possibility of identifying different health problems. These observations indicate the vulnerability of these individuals, which refers to the individual, collective, and contextual aspects causing susceptibility to diseases and injuries, as well as to aspects involving the availability of resources devoted for protecting people (20). This information should be considered for health action planning by NASF because studies have shown that the prevalence of communication disorders (involving speech, language and hearing) is indeed higher among children of racial minorities and those who are living in unfavorable socioeconomic and educational conditions (21-23). Another important aspect that possibly contributed to the limited access to health services in the region, as well as to limited knowledge about health problems, is the recent incorporation of the UBS Jd. D'Abril and Paulo VI by the social organization^a that is responsible for the four other UBSs selected in this study. Moreover, the Family Health Strategy has recently been implemented in these UBSs and

is not completely established. Family Health Strategy characteristics, such as the stimulation of popular participation, have been shown to contribute to the integration of community and family health teams, empowering the population. Thereafter, individuals become aware of the determinants of problems and are encouraged to develop critical thinking (24,25).

In this study, approximately 6.5% of individuals had specific speech, language, and swallowing complaints. It has been previously shown that the prevalence of speech and language disorders identified through population-based surveys is between 1% and 5% (26). By contrast, higher prevalence rates, between 5% and 15%, have been reported by means of speech-language screening or diagnostic techniques. As reported previously, the incidence of speech-language disorder ranges from 2% to 17%, depending on the criteria used to define such disorders and the age of the individuals (27).

It is important to highlight that the reasons for this variability of prevalence in speech and language impairment and complaints include the definition of what constitutes a case, the severity and type of communication impairment that is included in the definition, the nature of the surveyed population and differences in methodological procedures (28,29).

We found a prevalence of referred hearing complaints of 3.6%. Despite the lack of Brazilian population studies, hearing evaluation studies conducted in Rio Grande do Sul (30) and Minas Gerais (31) showed a prevalence of disabling hearing loss of 6.8% and 5.2%, respectively. The discrepancy between these prevalence rates may be due to methodological and regional differences, highlighting the necessity of further studies to identify the specific speech-language and hearing needs of each region, for the development of effective public health policies for each region of Brazil (10).

Analysis of the prevalence of speech-language complaints (speech, language and swallowing) by age group showed the highest prevalence of complaints among participants aged 50 to 69 years for Group 1, and among participants aged less than 20 years for Group 2, reflecting the highest concentration of older individuals in the first region and of younger individuals in the second region. Moreover, in the region with an older population, speech-language complaints due to strokes may become more evident. On the other hand, the prevalence of hearing complaints increased among participants above 70 years of age in both regions studied. These results are most likely related to presbycusis, which is the hearing loss related to aging, whose etiology

^a Social Organizations represent a partnership model adopted by the government for managing health care units. The partnership with charities allows the establishment of management contracts with the government, targeting public health management to improve the population's access to health services. (<http://www.saude.sp.gov.br/ses/acoes/organizacoes-sociais-de-saude-oss>).

**Table 5 - Referred complaints by age group.**

Variable	Category	Age												p-value					
		<20 years			20-29 years			30-49 years			50-69 years				over 70 years			Total	
		n	%		n	%		n	%		n	%			n	%		n	%
Speech-language complaints (speech, language, swallowing)	Group 1	2	1.19		13	7.69		41	24.26		53	31.36		20	11.83		129	76.33	
	Group 2	24	14.20		3	1.77		6	3.55		5	2.96		2	1.19		40	23.67	
		26	15.39		16	9.46		47	27.81		58	34.32		22	13.02		169	100	
Total (n and %)																			

Variable	Category	Age												p-value					
		<20 years			20-29 years			30-49 years			50-69 years				over 70 years			Total	
		n	%		n	%		n	%		n	%			n	%		n	%
Hearing complaints	Group 1	0	0		1	1.08		16	17.40		25	27.18		17	18.48		59	64.13	
	Group 2	7	7.60		3	3.27		4	4.34		13	14.13		6	6.52		33	35.87	
	Total (n and %)	7	7.60		4	4.35		20	21.74		38	41.31		23	25		92	100	

Chi-square test.

Table 6 - Speech-language and hearing therapy for the referred complaints.

Variable	Category	Age												p-value					
		<20 years			20-29 years			30-49 years			50-69 years				over 70 years			Total	
		n	%		n	%		n	%		n	%			n	%		n	%
Speech-language therapy for speech, language, and swallowing complaints	Group 1	0	0		2	8		2	8		2	8		2	8		8	32	
	Group 2	10	40		0	0		2	8		3	12		2	8		17	68	
		10	40		2	8		4	16		5	20		4	16		25	100	
Total (n and %)																			
Variable	Category	Age												p-value					
		<20 years			20-29 years			30-49 years			50-69 years				over 70 years			Total	
		n	%		n	%		n	%		n	%			n	%		n	%
Hearing therapy	Group 1	0	0		1	2.70		6	16.22		8	21.62		5	13.52		20	54.05	
	Group 2	4	10.82		0	0		2	5.40		8	21.62		3	8.10		17	45.95	
Total (n and %)		4	10.82		1	2.70		8	21.62		16	43.24		8	21.62		37	100	

Chi-square test.



may involve consequences of various harms inflicted throughout life, including degeneration linked to aging, noise exposure, ototoxic medicines and ear diseases in general. Presbycusis affects 30 to 60% of the geriatric population, and its prevalence varies according to socio-economic factors (32-36).

Importantly, less than 1/4 of the population that presented speech-language and hearing complaints had access to health services that rely on experts for monitoring and treating communication disorders. The western region of São Paulo has only one speech-language pathologist to assist the population of six basic health units and two speech-language pathologists in two Family Health Support Centers (NASF). Thus, the number of these professionals is not sufficient to meet the demand of this specific area. The lack of qualified professionals and financial resources is still a major concern in primary health care (37).

In a recent study, a quarter of the parents and teachers interviewed reported concerns about the speech and language of children. However, only 14.5% of the children received specific monitoring for speech-language pathology; moreover, there are many children whose parents do not have access to specific professionals who can alleviate or confirm their concerns (29).

The results of this study highlight the importance of establishing and adopting low-cost procedures such as surveys and screenings for the early identification of children who are at risk for developing communication disorders, especially in the poorest regions that do not have sufficient physical or human resources (10,38). We suggest that the Family Health Strategy is fundamental for helping people change their health-related knowledge, attitudes and behavior, thereby becoming aware of the importance of using the primary health care unit (UBS) as a reference.

Notably, estimates of the prevalence of diseases and disorders based on self-reported complaints, in all areas of knowledge, have the advantage of rapid information obtainment and low cost, enabling the adoption of this approach in large populations. However, this information is subject to bias because the method relies on the respondents' knowledge about the information of interest, their ability to recall the information, and their desire to provide the information. Furthermore, the disease or disorder may not yet have been diagnosed (12).

To verify the correlation between the referred complaints and diagnostic hypotheses, the subjects who reported complaints were invited to participate in a full clinical assessment at the university. Only 111 individuals (approximately 50%) of all subjects with complaints completed the assessment. It is noteworthy that most subjects invited to participate in the full clinical assessment reported many difficulties in attending it. The main reasons reported by the individuals who did not attend the full assessment at the University were as follows: no financial resources to spend on public transport; non-relevance of the full assessment; lack of confirmation about the necessity of attending the assessment; and the impossibility of absence from work, among other reasons. Other studies (39-42) also reported significant losses when individuals were required to visit a particular service to complete a procedure, suggesting that these difficulties are common in many countries.

This study identified a correlation of 0.70 between the complaint and diagnostic hypothesis, demonstrating a substantial agreement between the variables studied in the

field of speech-language and hearing science and supporting international studies using the referred complaints as a reliable measure of prevalence data (9-13).

Limitations

The prevalences obtained through the methodology presented should be used sparingly because of its limitations, but the prevalence data cannot be disregarded or overlooked because it provides important information that may assist in health planning, especially in places where the population is large and epidemiological data are scarce, as is the case in Brazil.

The prevalence of referred speech-language and hearing complaints in the population of the western region of São Paulo, Brazil, was 10%, and only half of the users of the public health system in the studied region who had complaints were monitored or received specific treatment.

The results also demonstrate the importance of using population surveys to identify speech-language and hearing complaints at the level of primary health care. Moreover, the findings highlight the necessity to reorganize the speech-language pathology and audiology service in the western region of São Paulo and to improve the Family Health Strategy in areas that do not have complete coverage, in order to expand and improve the territorial diagnostic and speech-language pathology and audiology actions related to the prevention, identification, and rehabilitation of human communication disorders.

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AUTHOR CONTRIBUTIONS

Oliver F and Junqueira S were in charge of data collection and tabulation. Rondon S collaborated in the data analysis. Samelli AG and Molini-Avejonas DR performed the data collection and were responsible for the data analyses, as well as general supervision of the execution stages and elaboration of the manuscript.

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