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COMPARISON OF THE EPIDEMIOLOGICAL PROFILE OF INDIVIDUALS WITH HEARING LOSS WHO USE OR DO NOT USE BRAZILIAN SIGN LANGUAGE

COMPARAÇÃO DO PERFIL EPIDEMIOLÓGICO DE PESSOAS COM PERDA AUDITIVA USUÁRIAS OU NÃO DE LIBRAS

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ABSTRACT: Objective: To analyze the sociodemographic and health characteristics of deaf Brazilian Sign Language (LIBRAS) users compared with non-users. Methodology: A cross-sectional descriptive epidemiological study was conducted with a non-probabilistic intentional sample. Data were collected by a self-reported and online questionnaire and underwent stratified analyses by subgroups of interest using Fisher's exact test and Odds Ratios. Results: Most study participants communicated using LIBRAS. Deaf non-sign language users had a higher schooling level compared with sign language users. We observed a higher proportion of employed men and unemployed women. Results highlight the linguistic barriers experienced by deaf sign language users regarding limitations in accessing health information about self-care and treatment. Conclusion: We found no statistically significant differences when comparing the sociodemographic and health characteristics between the groups of deaf LIBRAS users and non-users, except with regard to education and employment. Although not being a population-based study, these findings provide input for developing public policies aimed at deaf people in the region studied.

KEYWORDS: Epidemiological Profile. Hearing Loss. Sign Language. Access to Health Services.

RESUMO: Objetivo: Analisar características sociodemográficas e sanitárias de pessoas surdas usuárias de Língua Brasileiras de Sinais (Libras) em comparação com não usuárias. Metodologia: Estudo epidemiológico descritivo transversal com amostra intencional não probabilística. Os dados basearam-se em informações autorreferidas, coletadas via questionário online, com análises estratificadas por subgrupos de interesse usando o Teste Exato de Fisher e Razões de Chance. Resultados: A maioria dos participantes comunicava-se por Libras. Surdos não usuários de Libras apresentaram grau de escolaridade mais elevado quando comparados aos sinalizantes, além de haver maior proporção de homens trabalhando e de mulheres desempregadas. O estudo alerta para as barreiras linguísticas vivenciadas pelos usuários de Libras no tocante às limitações de acesso às informações de saúde sobre autocuidado e tratamento. Conclusão: Não foram encontradas diferenças estatisticamente significantes comparando-se as características sociodemográficas e sanitárias entre os grupos de surdos usuários e não usuários de Libras, exceto no tocante à escolaridade e ao trabalho/desemprego. Apesar de não ser um estudo de base populacional, é possível fornecer subsídios para a elaboração de políticas públicas voltadas às pessoas surdas da região estudada.

PALAVRAS-CHAVE: Perfil Epidemiológico. Perda Auditiva. Língua de Sinais. Acesso aos serviços de saúde.

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INTRODUCTION

Brazilian legislation clearly states the deaf population has the right to access essential services—such as health care—in Brazilian Sign Language (LIBRAS). LIBRAS was recognized by Law No. 10,436/2002[1] as a legal means of communication for deaf people and the right to health for this population group is ensured by Decree No. 5,626/2005[2].

For precepts like these to be put into practice, the government must implement effective policies for which epidemiological information is fundamental[3]. However, data on deaf people are scarce as Brazilian epidemiological surveys do not investigate their specificities. Notably, although in line with global practices, the main public instrument for collecting population data—the demographic census—does not go further into the deaf theme beyond quantifying hearing impairment.

According to the Brazilian Institute of Geography and Statistics (IBGE) 2010 Census, 5.1% of the Brazilian population presented hearing impairment, i.e., 9.8 million people reported "some difficulty" in hearing and 1.12% of the population (2.2 million people) had severe hearing impairment[4]. No updated data regarding the 2022 Census is available as the official results are yet to be released. In turn, the 2013 and 2019 National Survey of Health (PNS) reported 1.1% of people with hearing impairment in Brazil, i.e., approximately 2.3 million people[5,6].

Differences in the data produced by each survey stems from the different methodologies employed; therefore, no consensus exists on the size of the Brazilian population with hearing impaired, much less on LIBRAS users.

In addition to information commonly investigated by the survey, the PNS 2019 included questions that are particularly important for this population group, such as the use of assistive devices (hearing aids, cochlear implants), device procurement and communication in LIBRAS[7].

Using LIBRAS to communicate or not is the basic information to classify individuals as "deaf" and not as "person with hearing impairment," terms often mistakenly used as synonyms. For the purposes of a population survey, we could say that within the group "people with hearing impairment" is the subgroup "deaf people," usually invisible and therefore with some degree of additional vulnerability.

However, although the PNS considered LIBRAS in the 2019 survey, only individuals with five years of age or older were asked about its use and the survey did not make data available by cities.

In the literature, several works[3,8,9,10,11] strictly investigate the prevalence of hearing impairment and hearing loss-associated factors, ignoring a more complete characterization of the deaf population regarding their habits, living conditions, health care access and sign language use. Information on deafness prevalence and some general data on education and employment are known, but we have no concrete data on how many people are oral-deaf, how many are LIBRAS users, how deaf LIBRAS users are distributed across Brazil, what are their health habits and, above all, what barriers they face in accessing health care.

Moreover, LIBRAS is predominant in urban centers but not the only sign language used in Brazil. Studies have identified approximately 12 sign languages used by deaf communities and isolated groups in the country[12]. Deaf users of other sign languages, and not only LIBRAS, must be included in epidemiological surveys considering their particularities.

Existing gaps in this population's epidemiological data results in instrumental limitations for planning actions aimed at this public, which ultimately harms their social inclusion and quality of life[13].

Scientific literature shows that epidemiological data scarcity on deaf people is not a Brazilian particularity, and can be observed in other countries[14,15,16]. Research conducted in the United States highlights the contradiction between the large number of people with hearing loss and the lack of a

robust research base on their health aspects in public health studies[14]. In Greece, studies have reported that people with hearing loss are excluded from public health policies despite a worldwide trend of seeking a better quality of life for this population[15].

A Chilean study investigating the deaf population's access to health care using information from a national epidemiological survey highlighted information inaccuracy as one of the survey's limitations as the interview was not adapted into sign language during data collection, thus resulting in communication barriers. Information about them was often provided by a hearing relative instead of the individuals themselves[16].

Using only epidemiological surveys to investigate information on deaf people is therefore insufficient. Ensuring the reliability of produced data requires a research methodology adapted to the particularities of deaf interviewees, thus guaranteeing that the reported information comes from the researched individuals and not from third parties. In Brazil, one adaptation approach is translation of the questions into Brazilian Sign Language by a fluent sign interpreter.

Given this scenario, this research analyzes the sociodemographic and health characteristics of deaf LIBRAS users compared with non-users.

METHODOLOGY

A cross-sectional epidemiological study was conducted with deaf individuals, LIBRAS users or not, aged over 18 years and living in the Campinas Metropolitan Area.

Data were collected by an online questionnaire for obtaining self-reported information, made available through Google Forms. This type of questionnaire is a lower-cost, accessible, and faster strategy but more susceptible to classification errors[17]. The material was adapted to the target population containing questions in both Portuguese and LIBRAS to ensure linguistic accessibility, increase accuracy and reduce risks of miscommunication.

Previously tested in a pilot study, the questionnaire consisted mostly of closed questions with pre-defined alternatives, organized into identification data, socioeconomic and demographic aspects, health status and behaviors related to health and lifestyle.

It was disseminated on social media (websites, Facebook, Instagram, and WhatsApp groups), press vehicles (journalistic articles, television news) and events of Deaf Communities. It was also released by the Deaf Association of Campinas (ASSUCAMP), the Department of Welfare, Persons with Disabilities and Human Rights of Campinas and members of the Deaf Community.

The collected data composed the list of sampling units, stored in an Excel spreadsheet automatically generated by Google Forms. Of the 588 responses obtained, 339 were considered valid and used for meeting the inclusion criteria, namely deaf individuals who communicate using the Brazilian Sign Language (LIBRAS) or not, aged 18 years or older and living in the Campinas Metropolitan Area. Statistical analysis was based on producing frequency tables of categorical variables with absolute frequency (n) and percentage (%) values as stratified analyses by subgroups of interest, evaluated from different points of view and statistical techniques, including exploratory analyses and comparisons between groups using Fisher's exact tests and odds ratios derived from specific logistic models adjusted to the data.

The study was approved by the Research Ethics Committee (opinion 6.764.046/CAAE 46533221.8.0000.5404). All research participants had access to an informed consent form, in Portuguese and LIBRAS, and received the document via email after having accepted it.

RESULTS

To analyze the sociodemographic and health characteristics of deaf Brazilian Sign Language (LIBRAS) users comparing them with non-users, 339 valid answers were obtained. Socioeconomic, demographic and health aspects are presented below by sex (Tables 1 and 2) and by LIBRAS use (Tables 3 and 4).

Each table, and segmented by the other selected variables, brings the p-values of Fisher's exact test for differences in distribution. Values lower than 5% indicate a significant difference by sex (Tables 1 and 2) or LIBRAS use (Tables 3 and 4).

Regarding sociodemographic aspects, 316 (93.2%) respondents communicated in LIBRAS, mean age was 41 years, 244 (72.2%) declared themselves White, 150 (44.2%) claimed to be evangelical, 160 (47.3%) had complete secondary education and 204 (60.2%) had a job (Table 1).

Based on an adjusted logistic model (generalized linear model with logistic linkage function), it was found that evangelicals are approximately 80% less likely to consume alcoholic beverages when compared with irreligious people (odds ratio: 0.2059); for Catholics the odds were lower by 48% (odds ratio: 0.5223). Regarding smoking, evangelicals are approximately 90% less likely to smoke compared with irreligious participants (odds ratio: 0.1062) and Catholics are also approximately 90% less likely to smoke (odds ratio: 0.0770).

As for the comparison by sex, only employability was statistically different (Table 1, p-value < 0.001), due to higher percentages of men employed/studying and unemployed women.

Table 1. Description of research participants' socioeconomic and demographic characteristics

Characteristic	N = 339	Female N=194	Male N=145	p-value[a]
Communicates using LIBRAS				0,094
	N = 339	N = 194	N = 145	
Yes	316 (93,2%)	177 (91,2%)	6 (4,1%)	
No	23 (6.78%)	17 (8,8%)	139 (95,9%)	
Age				0,5
	N = 339	N = 194	N = 145	
	41 (18:83)[b]	41 (19:83)[b]	42 (18:76)[b]	
Schooling level				0,9
	N = 338	N = 194	N = 145	
Primary education	52 (15,4%)	33 (17,1%)	19 (13,1%)	
Secondary education	160 (47,3%)	87 (45,1%)	73 (50,4%)	
Tertiary education	78 (23,0%)	45 (23,3%)	33 (22,8%)	
Graduate education (specialization, master's, PhD)	36 (10,7%)	21 (10,8%)	15 (10,3%)	
No schooling	12 (3,6%)	7 (3,6%)	5 (3,4%)	
Not reported	1	1	0	
Empoyment				<0,001
	N = 339	N = 194	N = 145	
Yes, I have a job	204 (60,2%)	106 (54,6%)	98 (68,0%)	
No, I'm unemployed	66 (19,5%)	53 (27,3%)	13 (9,0%)	
No, because I'm retired	34 (10,0%)	16 (8,3%)	18 (12,0%)	
I'm unemployed and receiving BPC/INSS benefits	29 (8,5%)	18 (9,3%)	11 (7,6%)	
No, because I'm a student	6 (1,8%)	1 (0,5%)	5 (3,4%)	
Ethnic group				0,12
	N = 338	N = 194	N = 145	
White	244 (72,2%)	138 (71,5%)	106 (73,1%)	
Mixed-race	77 (22,8%)	49 (25,4%)	28 (19,3%)	
Black	11 (3,2%)	3 (1,6%)	8 (5,5%)	
Yellow	5 (1,5%)	2 (1,0%)	3 (2,1%)	
Indigenous	1 (0,3%)	1 (0,5%)	0 (0%)	
Not reported	1	1	0	
Religion				0,4
	N = 339	N = 194	N = 144	
Evangelical	150 (44,2%)	81 (41,7%)	69 (48,0%)	
Catholic	103 (30,4%)	64 (33,0%)	39 (27,0%)	
Irreligious	62 (18,3%)	32 (16,5%)	30 (20,8%)	
Spiritist	10 (3,0%)	6 (3,1%)	4 (2,8%)	
Other	7 (2%)	6 (3,1%)	1 (0,7%)	
Umbanda/Candomblé	5 (1,5%)	4 (2,1%)	1 (0,7%)	
Not reported	2 (0,6%)	1 (0,5)		

Source: the authors.
Notes: rounded numerical data;
a – Pearson's Chi-square test p-value (in cases where the expected value of any house is less than 5, the p-value reported in the table refers to Fisher's Exact Test);
b – average; minimum; maximum age.

Regarding health aspects, 196 (58%) respondents self-assessed their health status as good, 307 (90.8%) reported not having diabetes and 268 (79%) not being hypertensive, 325 (96.1%) did not smoke and 221 (65.4%) did not consume alcohol (Table 2).

Table 2. Description of research participants' health characteristics

Characteristic	N = 339	Female N=194	Male N=145	p-value[a]
Self-assessment of health status[b]				0,4
	N = 338	N = 194	N = 145	
Very good	62 (18,3%)	33 (17,1%)	29 (20%)	
Good	196 (58,0%)	110 (57,0%)	86 (59,3%)	
Average	69 (20,4%)	41 (21,2%)	28 (19,3%)	
Bad	7 (2,1%)	5 (2,6%)	2 (1,4%)	
Very bad	4 (1,2%)	4 (2,1%)	0 (0%)	
Not reported	1	1	0	
Diabetes				0,2
	N = 338	N = 194	N = 145	
Yes and I take medicine	27 (8,0%)	11 (5,7%)	16 (11,0%)	
Yes, but I don't take medicine	4 (1,2%)	2 (1,0%)	2 (1,4%)	
No	307 (90,8%)	180 (93,3%)	127 (87,6%)	
Not reported	1	1	0	
Arterial hypertension				0,4
	N = 339	N = 194	N = 145	
Yes and I take medicine	59 (17,4%)	31 (16,0%)	28 (19,3%)	
Yes, but I don't take medicine	12 (3,6%)	9 (4,6%)	3 (2,1%)	
No	268 (79,0%)	154 (79,4%)	114 (78,6%)	
Smoking				0,7
	N = 338	N = 194	N = 145	
Yes, every day	5 (1,5%)	2 (1,0%)	3 (2,0%)	
Yes, sometimes	8 (2,4%)	4 (2,1%)	4 (2,8%)	
No	325 (96,1%)	187 (96,9%)	138 (95,2%)	
Not reported	1	1	0	
Alcohol consumption				0,2
	N = 338	N = 194	N = 145	
Yes, every day	1 (0,3%)	0 (0%)	1 (0,7%)	
Yes, sometimes	116 (34,3%)	61 (31,6%)	55 (38%)	
No	221 (65,4%)	132 (68,4%)	89 (61,3%)	
Not reported	1	1	0	

Source: the authors.
Notes: rounded numerical data;
a – Pearson's Chi-square test p-value (in cases where the expected value of any house is less than 5, the p-value reported in the table refers to Fisher's Exact Test);
b – we adopted the same scale as the PNS 2019 for self-assessment of health status (IBGE (e), 2021).

Socioeconomic characteristics, especially education, are often associated with the adoption of healthy behaviors in developed countries, since groups of lower socioeconomic status are more likely to act in ways that harm their health than groups of higher socioeconomic status[18]. For this reason, we tested the hypothesis that "schooling" could influence "self-rated health," but a weak association was found between these two variables: p-value for Fisher's Exact Test of 0.1173, after regrouping the self-rated health into "Regular / Poor / Very Poor" and "Good / Very Good" and regrouping "Tertiary education" and "Graduate education" in "Tertiary or Graduate" for schooling (Table 2).

When comparing LIBRAS users and non-users in relation to socioeconomic and demographic aspects, only gender and education (both with p-value < 0.001) were statistically different.

Regarding education, a higher percentage of deaf non-LIBRAS users reported having entered tertiary education—9 individuals (39.1%)—or graduate studies—7 individuals (30.4%)—compared with 69 (21.9%) deaf LIBRAS users with tertiary education and 29 (9.2%) with graduate studies.

Although women were the majority of respondents in both groups, the statistically significant difference regarding sex is due to the higher percentage of women among deaf non-LIBRAS users (73.9%) compared with deaf LIBRAS users (56%).

White predominated in the racial variable, 227 (72%) among LIBRAS users and 17 (73.9%) non-LIBRAS users, as well as the evangelical and Catholic religions in both groups (Table 3).

Table 3. Comparative analysis of socioeconomic and demographic characteristics between deaf LIBRAS users and non-users

Characteristic	Deaf LIBRAS users N=316	Deaf non-LIBRAS users N=23	p-value[a]
Age	41 (18:76)[a]	42 (18:76)[a]	<0,001
Sex			
Female	177(56,0%)	17 (73,9%)	
Male	139 (44%)	6 (26,1%)	
Schooling level			<0,001
Primary education	50 (15,9%)	2 (8,7%)	
Secondary education	157 (49,8%)	3 (13,0%)	
Tertiary education	69 (21,9%)	9 (39,1%)	
Graduate education (specialization, master's, PhD)	29 (9,2%)	7 (30,4%)	
No schooling	10 (3,2%)	2 (8,7%)	
Not reported	1	0	
Employment			0,3
Yes, I have a job	188 (59,5%)	16 (69,6%)	
No, I'm unemployed	65 (20,6%)	1 (4,3%)	
No, because I'm retired	31 (9,8%)	3 (13,0%)	
I'm unemployed and receiving BPC/INSS benefits	26 (8,2%)	3 (13,0%)	
No, because I'm a student	6 (1,9%)	0 (0,0%)	
Ethnic group			0,9
White	227 (72,0%)	17 (73,9%)	
Mixed-race	72 (22,9%)	5 (21,7%)	
Black	10 (3,2%)	1 (4,4%)	
Yellow	5 (1,6%)	0 (0,0%)	
Indigenous	1 (0,3%)	0 (0%)	
Not reported	1	0	
Religion			0,057
Evangelical	142 (44,9%)	8 (34,8%)	
Catholic	95 (30,0%)	8 (34,8%)	
Irreligious	59 (18,7%)	3 (13,0%)	
Spiritist	7 (2,2%)	3 (13,0%)	
Other	7 (2,2%)	0 (0,0%)	
Umbanda/ Candomblé	5 (1,6%)	0 (0,0%)	
Not reported	1 (0,3)	1 (4,3)	

Source: the authors.
Notes: rounded numerical data;
a – Pearson's Chi-square test p-value (in cases where the expected value of any house is less than 5, the p-value reported in the table refers to Fisher's Exact Test);

Regarding health characteristics, no variable was statistically significant, with most LIBRAS users and non-users self-evaluating their health as good, stating that they did not have hypertension and diabetes, as well as not consuming alcohol or tobacco.

Table 4. Comparative analysis of health characteristics between deaf LIBRAS users and non-users

Characteristic	Deaf LIBRAS users N=316	Deaf non-LIBRAS users N=23	p-value[a]
Self-assessment of health status			>0,9
Very good	57 (18,1%)	5 (21,7%)	
Good	182 (57,8%)	14 (60,9%)	
Average	65 (20,6%)	4 (17,4%)	
Bad	7 (2,2%)	0 (0,0%)	
Very bad	4 (1,3%)	0 (0%)	
Not reported	1	0	
Diabetes			>0,9
Yes and I take medicine	25 (7,9%)	2 (8,7%)	
Yes, but I don't take medicine	4 (1,3%)	0 (0,0%)	
No	286 (90,8%)	21 (91,3%)	
Not reported	1	0	
Arterial hypertension			0,13
Yes and I take medicine	52 (16,4%)	7 (30,4%)	
Yes, but I don't take medicine	11 (3,5%)	1 (4,3%)	
No	253 (80,0%)	15 (65,2%)	
Smoking			>0.9
Yes, every day	5 (1,6%)	0 (0,0%)	
Yes, sometimes	8 (2,5%)	0 (0,0%)	
No	302 (95,9%)	23 (100,0%)	
Not reported	1	0	0,2
Alcohol consumption			
Yes, every day	1 (0,3%)	0 (0,0%)	
Yes, sometimes	105 (33,3%)	11 (47,8%)	
No	209 (66,4%)	12 (52,2%)	
Not reported	1	0	

Source: the authors.
Notes: rounded numerical data;
a – Pearson's Chi-square test p-value (in cases where the expected value of any house is less than 5, the p-value reported in the table refers to Fisher's Exact Test).

DISCUSSION

Most participants (n=212, 62.7%) have complete primary and secondary education and only 12 (3.6%) declared having no schooling, highlighting the high schooling level of the sample. A probable selection bias, requiring participants to have access to cell phones, computers, and the internet to answer the questionnaire, and thus restricting the participation of a more socioeconomically vulnerable population, may explain this finding.

Notably, for people without disabilities these percentages are distributed differently. As an example, the percentage of individuals without disabilities without schooling was 30.9%, representing a difference of 40.1 percentage points when compared with deaf individuals for the same parameter (71%)[6].

Another possible explanation for this high schooling, in contrast to other studies, may be the greater age diversity among participants. A study characterizing the epidemiological profile of individuals with impaired hearing attended in public services found that most users in the sample were older adults with incomplete primary education[19]. According to the PNS 2019, this low schooling is justified by the greater concentration of illiterate people at older ages[6].

Moreover, statistically significant differences were found regarding schooling due to the higher percentage of deaf non-LIBRAS users reporting schooling level beyond secondary education (p-value, for Fisher's Exact Test, lower than 0.001): 39.13% reported having complete tertiary education (against 21.9% of LIBRAS users) and 30.43% graduate education (against 9.2% of LIBRAS users). Such differences stem from the fact that deaf non-LIBRAS users tend to communicate using oral or written Portuguese, facilitating their inclusion in educational institutions predominantly based on the hearing culture.

Regarding employment, most respondents have a job (60.2%; 59.5% deaf LIBRAS users and 69.6% non-users). For comparison and based on PNS 2019 microdata, after sample expansion and post-stratification, there was 56.1% unemployment among deaf adults LIBRAS users and 70.3% unemployment among deaf adults non-users[20]. Therefore, this study found a higher employment rate among deaf people than the PNS data.

Importantly, although most participants are employed this does not mean that they are working at their full working capacity, that is, their job does not necessarily correspond to their educational background. Deaf people suffer discrimination in the professional field not only regarding their professional capacity, but also permanence in the labor market[21].

Despite support from the Lei de Cotas (Affirmative Action Law), when deaf individuals enter professional environments they are often only seen for their disability, never their qualification. A study conducted with deaf people in the municipality of Tubarão indicates that the biggest challenge for deaf individuals searching for labor market inclusion is the lack of accessibility in LIBRAS, whether in the work environment or in the selection process itself[22]. This exclusion negatively impact the psychological, financial and family spheres, leading to feelings such as inferiority[22].

Regarding self-assessment of health status, which refers to how participants perceive their own condition encompassing both physical and biological aspects of illness and pain, and the emotional aspects of these processes[7], education is considered an important determinant for the adoption of healthy lifestyles.

People's behavior in favor of self-care refers to one of the SUS responsibilities: health promotion, a process that involves empowering the community to improve its quality of life and health, and this should be considered a resource to live and not an end in itself[23].

Many strategies adopted for health promotion are restricted to sharing knowledge about the health-disease process using oral and/or written language, such as conversation circles; educational

materials like folders, pamphlets, posters (printed or virtual); videos broadcast on television and social media, such as those produced for campaigns such as dengue, COVID-19, breastfeeding, etc. But few of these strategies are accessible in LIBRAS, therefore depriving deaf people of this information. A growing number of videos containing accessibility via LIBRAS interpreter have been observed more recently, at least in those produced by the Ministry of Health, in contrast to those produced by state and municipal Health Departments.

For promotion actions to be developed in health units, health workers need to consider the inclusion of deaf individuals from planning to execution. On the other hand, conducting health promotion in health units is unfeasible if no workers know LIBRAS or the presence of a LIBRAS interpreter is impossible.

Moreover, these actions are the responsibility not only of the health sector, but also of education, work/employment, among others, as they are directly related to the social determinants of health[23]. One of our main findings concerns the differences in schooling between deaf LIBRAS users and non-users, demonstrating the need for government investments in quality education which generates positive repercussions on health.

A study conducted in Japan found that participants with low schooling had a higher risk of engaging in unhealthy behaviors[18]. From the point of view of schooling, the results showed a weak positive association between self-rated health status and schooling level. Nonetheless, knowledge of health information influences an individual's perception of their own health.

Many deaf people have low understanding of health information due to the scarcity of sign language materials and the deprivation of incidental learning opportunities, i.e., learning health information in everyday conversations, through television, social media and other means of communication[24,25]. A large number of deaf individuals never become literate in the hearing language[26], but even those who do face challenges in understanding written health information as the available material is often full of medical jargon[25].

Lack of knowledge increases their risk of health problems when compared with the general population[24,27]. We could thus infer that the more one's is educated, the greater their knowledge on health and, consequently, the greater the probability them exercising self-care and evaluating their condition positively. A hypothesis confirmed by the 2019 PNS, as its data showed that higher schooling levels had a higher percentage of respondents classifying their health as good or very good[7].

Most respondents denied having diabetes and hypertension. However, these chronic diseases are highly prevalent conditions in Brazil, especially in the adult population[28,29], and tend to increase with advancing age from the age of 60[30]. Since the most expressive age group were adults, this leads to question whether most of the sample did, in fact, not have these problems or if they were simply unaware Both diabetes and hypertension are silent conditions which are often asymptomatic; when symptoms do manifest, they are hardly identified by lay individuals as part of the disease process of diabetes or hypertension. Knowing this information regarding one's own health requires the person to have access to medical care and screening measures; however, several studies[31,32] show that deaf LIBRAS users face several difficulties in their relations with health care professionals.

Studies also point out that deaf people have worse experiences in health services in terms of access, quality and satisfaction than hearing people, whether in Brazil[33,34], or in other countries[24,35]. Poor experiences such as these distance them from medical services and contributes to a lack of access to health information[24,27,36]. By seeking these services less, deaf people are more susceptible to developing diseases that could be avoided or having their morbidity and mortality reduced, if there was early screening[27], such as diabetes and hypertension.

A study with 110 deaf residents of the Maringá metropolitan area found that only 29.4% reported having access to routine consultations and exams for disease prevention[27]. The authors observed a lower prevalence of diabetes and hypertension compared with the general population, but they also raised the possibility of late diagnosis and underdiagnosis based on other studies found on the subject[27].

Considering the underdiagnosis of diseases in this population and the self-reported nature of the health information obtained in this study, we may question whether the percentage of deaf individuals with diabetes and/or hypertension corresponds to reality. The government should therefore invest in screening actions for chronic diseases aimed at deaf people, with accessibility in sign language.

Still regarding health data, four people (1.2%) reported untreated diabetes and 12 (3.6%) answered similarly for arterial hypertension. These numbers show that even those individuals who receive a diagnoses find it difficult to pursue adequate treatment, as reported by other studies in the literature[24,27].

A US-based study observed that even if deaf patients are diagnosed, they face difficulties in obtaining adequate information to manage their health issues, which lowers the physician-patient relation quality[36] and, consequently, treatment adherence[24]. Investigating the prevalence of chronic diseases in this population is a highly complex task, as it encompasses not only environmental, social and lifestyle factors, but also communication barriers[27].

We found no statistical difference in diabetes and hypertension treatment between genders. However, several studies indicate that men, when making an effort to avoid showing signs of frailty, tend to aggravate their health problems[37]. Specifically for type 2 diabetes mellitus (DM2), female patients tend to adhere more to treatment than male patients[38]. Norms associated with masculinity end up discouraging men from seeking medical help and adopting measures to improve their glycemic control[38]. Factors associated with gender roles cause adult men with higher machismo scores to greater reject the DM2 diagnosis[39]. The lack of data on how deaf men are treated for diabetes mellitus in the literature highlights the need to further investigate this topic.

As for the consumption of psychoactive substances, 221 (65.4%) participants reported no alcohol consumption and 325 (96.1%) are not smokers. We intended to compare the pattern of substance use in our sample with others, but few studies investigate the habits of this population. Most research on this theme focus on the relationship between alcohol use or smoking and hearing loss, and therefore on the etiology of deafness[40,41,42].

Religion appears in the scientific literature as a protective factor against substance use for the general population[43], which is corroborated by our findings due to the lower propensities of participants to consume alcohol (80% less likely for evangelicals and 48% less likely for Catholics) and to smoke (90% less likely for evangelicals and 93% less likely for Catholics). We can therefore state that Christian religions, which are more prevalent among the study participants, are associated with a lower probability of smoking and consuming alcohol.

Regarding alcohol consumption, there was no statistical difference between genders since the p-value found for the hypothesis test was 0.2, as well as for tobacco use, considering the p-value of 0.9. We found no studies in the literature to support this analysis.

Our study had a prevalence of adults in the age group variable, differing from the studies by Barbosa et al.[3] and Jardim et al.[19] with a higher prevalence of older adults. Most studies of this type use samples of patients from health services related to deafness. Given the prevalence of hearing loss in older adults, this ends up being the largest public for these services. Despite the high number of older adults with hearing loss in the population, using an online data collection instrument hindered reaching them, which is a limitation of the study.

As for race, most respondents (72.2%) identify themselves as White. These results in line with a study on the prevalence of chronic non-communicable diseases and associated factors among deaf people, in which most participants were white[27]. According to the PNS 2019, there was no statistical difference between the variables considering the race of participants with hearing impairment[6]. A study on preliminary intersectional discussions in Deaf education argued that few studies investigate intersectionality in relation to the Deaf Community, and research addressing the experience of Black deaf individuals is scarce. Racial issues in the Deaf Community is, therefore, a theme that needs further study[44].

The results presented and discussed in this article both contribute to expand knowledge and bring practical implications that may support public management, especially that of the cities in the Campinas Metropolitan Area. Schooling discrepancies point to the need for educational system reformulations aimed at improving not only access, but also quality. This issue is also directly related to employability, and it is necessary, in addition to advances in education, to encourage the hiring of deaf people that consider their linguistic specificities, from the selection process to the performance of functions.

Permanent education strategies for health professionals on the differences between groups of deaf LIBRAS users and non-users are needed, addressing aspects such as Deaf Identity and Culture, Deaf Community and Sign Language and not only about technologies, such as hearing aids. Deaf people have health needs like any and all citizens, not being restricted to demands that concern only and exclusively the hearing aspects. For them to be embraced in a comprehensive manner, health professionals must employ attentive and qualified “listening,” who without a common language will not be unable to perform their role as to meet citizen needs. For this reason, it is urgent to invest in the training of health professionals knowledgeable in LIBRAS, to hire professional LIBRAS translators and interpreters and, above all, to offer practical disciplines of LIBRAS during undergraduate courses.

CONCLUSION

Deaf non-LIBRAS users had a higher schooling level when compared with deaf LIBRAS users. Results showed a higher prevalence of deaf men employed/studying and unemployed women. Despite no statistically significant differences between the groups regarding health aspects, the linguistic and communicational barriers experienced by deaf LIBRAS users can limit access to information about self-care and treatment.

Although not a population-based study representative of deaf people in the Metropolitan Area researched, this work offers subsidies for planning research with greater municipal or regional scope and for adopting measures aimed at this public. Additionally, the research contributes to advancing this topic in Public Health studies, which has little investigated this vulnerable population.

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