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Prevalence of non-communicable chronic diseases and associated factors in deaf people

Prevalência de doenças crônicas não transmissíveis e fatores associados em pessoas surdas

Prevalencia de enfermedades crónicas no transmisibles y factores relacionados en personas sordas

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ABSTRACT

Objective: To analyze the prevalence and factors associated with non-communicable chronic diseases in deaf people. **Methods:** Cross-sectional study with 110 deaf people in Maringá-Paraná, selected using the snowball sampling technique. Data were collected from February to August 2019, using a structured instrument; and, in the analysis, multiple logistic regression was used. **Results:** The self-reported prevalence of chronic diseases was 43.6%, the most frequent being: arterial hypertension (12.7%), depression (6.4%), diabetes mellitus (5.4%), respiratory disease (5.4%) and hypothyroidism (4.5%). Using health services for routine consultations was significantly associated with being bimodal bilingual. The only risk behavior significantly associated with chronic disease was excessive consumption of sweet foods. **Conclusion:** The prevalence of chronic diseases in this population may be higher than that found, as there is a possibility of underdiagnosis due to the low demand for routine consultations and the difficulty of communication with health professionals.
Descriptors: Chronic Disease; Prevalence; Deafness; Communication Barriers; Health Behavior.

RESUMO

Objetivo: Analisar a prevalência e os fatores associados às doenças crônicas não transmissíveis em pessoas surdas. **Métodos:** Estudo transversal com 110 pessoas surdas, em Maringá-Paraná, selecionadas com a técnica snowball sampling. Coletaram-se dados de fevereiro a agosto de 2019, mediante aplicação de instrumento estruturado; e, na análise, utilizou-se regressão logística múltipla. **Resultados:** A prevalência autorreferida de doenças crônicas foi de 43,6%, sendo as mais frequentes: hipertensão arterial (12,7%), depressão (6,4%), diabetes mellitus (5,4%), doença respiratória (5,4%) e hipotireoidismo (4,5%). Utilizar os serviços de saúde para consulta de rotina apresentou associação significante com ser bilíngue bimodal. O único comportamento de risco associado significantemente com doenças crônicas foi consumo excessivo de alimentos doces **Conclusão:** A prevalência de doenças crônicas nessa população pode ser maior do que o encontrado, pois há a possibilidade do subdiagnóstico decorrente da pouca procura por consultas de rotina e da dificuldade de comunicação com os profissionais de saúde.
Descritores: Doença Crônica; Prevalência; Surdez; Barreiras de Comunicação; Comportamentos Relacionados com a Saúde.

RESUMEN

Objetivo: Analizar prevalencia y factores relacionados a las enfermedades crónicas no transmisibles en personas sordas. **Métodos:** Estudio transversal con 110 personas sordas, en Maringá-Paraná, seleccionadas con la técnica snowball sampling. Recolectados datos de febrero a agosto de 2019, mediante aplicación de instrumento estructurado; y, en el análisis, utilizado regresión logística múltiple. **Resultados:** La prevalencia autorreferida de enfermedades crónicas fue de 43,6%, siendo las más frecuentes: hipertensión arterial (12,7%), depresión (6,4%), diabetes mellitus (5,4%), enfermedad respiratoria (5,4%) e hipotiroidismo (4,5%). Utilizar los servicios de salud para consulta rutinaria presentó relación significante con ser bilingüe bimodal. La única conducta de riesgo relacionado significativamente con enfermedades crónicas fue consumo excesivo de alimentos dulces. **Conclusión:** La prevalencia de enfermedades crónicas en esa población puede ser mayor que lo encontrado, pues hay la posibilidad del sobrediagnóstico resultante de la escasa búsqueda por consultas rutinaria y de la dificultad de comunicación con los profesionales de salud.
Descriptores: Enfermedad Crónica; Prevalencia; Sordera; Barreras de Comunicación; Conductas Relacionadas con la Salud.

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INTRODUCTION

Chronic noncommunicable diseases (CNCDs) – cardiovascular, respiratory, cancer and diabetes – are a challenge for health systems, especially in developed or developing countries. In 2018, these were responsible for 71% of global mortality[1]. In Brazil, mortality from CNCDs reaches 73%, with a 17% risk of premature death[1].

CNCDs have some modifiable risk factors in common: sedentary lifestyle, unhealthy diet, smoking and harmful use of alcohol[1-2]. The first two contribute to overweight and obesity, which, in turn, trigger an increase in blood pressure, hypercholesterolemia and, consequently, an increased risk of death from this cause[1-2]. To effectively address CNCDs and their main risk factors, it is essential that countries adopt viable interventions[1] that are equitably addressed to the entire population. They must necessarily include people with hearing impairment, especially the deaf, as the communication barrier can hinder adequate access to health information[3].

Deaf people have a hearing loss (HL) greater than 40 decibels (considered moderate or profound) in the ear with better functionality, while hearing impairment refers to a reduction in the sensory efficiency of hearing. In Brazil, in 2010, there were 9.7 million people with hearing loss, and 1.12% (2.1 million) were deaf[4]. Worldwide, 5% of the population (466 million people) have moderate or severe HL, with estimates of reaching 900 million by 2050[5].

The health care provided to these people is characterized by some gaps. The infrastructure, for example, is inadequate for their reception and care; and the lack of knowledge of health professionals about Libras generates uncertainty in relation to the health care prescribed to deaf people[6]. In this context, deaf people, in addition to depending on non-deaf people, family members, friends and Libras interpreters to help them communicate in health services, are more vulnerable to poor self-care, to adopt risky behaviors and to not be diagnosed early[3], which contributes to the early onset of CNCDs and their complications.

In addition to the communication barrier in health services for this population, health promotion and disease prevention campaigns in the media (radio, written materials and internet) are not always available in an accessible way to this public, which commonly presents greater difficulty with reading, language and writing[7]. These isolated factors or associated with other issues, for example, communication difficulties within the family itself, can negatively influence the adoption of healthy behaviors and habits[8].

Faced with this problem, this study is justified because, in the national literature, most research with this population focuses on the area of education. In the health area, there are few publications that address aspects related to access to health services and/or communication with the professionals of these services[7]. There are no recent studies focused on CNCDs in deaf people. Considering the evidence that CNCDs represent a serious public health problem and the need to adopt strategies to reduce them in the population, with equity, it is essential to know the behavioral characteristics and prevalence of CNCDs in the deaf. This is because the communication difficulties of this population with health professionals can be a cause for underdiagnosis, which makes early treatment impossible and, consequently, impacts the emergence of complications. In this context, nursing has a fundamental role in health education with this public, as this attribution is an important part of its activities, provided for in the guidelines that regulate their professional practice.

OBJECTIVE

To analyze the prevalence and factors associated with non-communicable chronic diseases in deaf people.

METHODS

Ethical aspects

The study was submitted and approved by the Research Ethics Committee of the Universidade Estadual de Maringá (UEM), following all the ethical and legal precepts of research with human beings. In compliance with the provisions of the General Data Protection Law (Law No. 13,709/18), specific care was taken with the bank that contains the participants' data, especially in relation to identification. All participants signed the Free and Informed Consent Form in two copies.

Design, study location and period

This is a cross-sectional study, guided by the STROBE tool (Strengthening the Reporting of Observational Studies in Epidemiology). It was carried out with deaf people residing in the municipalities of the metropolitan region of Maringá, state of Paraná, which are part of the contiguous urbanized area (less than three kilometers away from the main urbanized areas): Maringá, Paiçandu and Sarandi.

Data collection took place from February to August 2019 and was carried out on the day, time and place defined by the participants, taking place in their homes, especially on weekends and at night; and in more reserved areas of public places (food courts in supermarkets and shopping malls), during business hours. During the collection, the first author read and/or explained to the participants, in Libras, the questions of the semi-structured instrument, developed specifically for this study.

Population and sample: inclusion and exclusion criteria

The study population consisted of deaf people residing in the three mentioned municipalities. The sample studied was selected in a non-probabilistic way, using the snowball sampling technique, which assumes that individuals with certain characteristics or common activities are connected to a social network. This technique makes it possible for individuals belonging to hidden, vulnerable and difficult-to-reach populations to be more easily identified through the indication of another person from the same population group[9].

Inclusion criteria were: being 18 years of age or older and having profound or severe HL since childhood. The exclusion criteria established were: the person not knowing how to communicate in Libras and not answering more than 10% of the questions in the data collection instrument.

The first participants were located on the occasion of the intentional participation of the first author in a lecture held at the *Maringá deaf association* (Asumar). This institution focuses on the defense and guarantee of rights for the deaf and family guidance. It works in favor of the development and autonomy of the hearing impaired through the elaboration of actions for their integration into society. In this sense, it promotes monthly lectures, provides a Libras course for family members, public servants, and companies, and provides advice to associates, providing clarifications related to rights, the job market and accessibility.

About 420 people are registered at the institution, but demand is occasional and sporadic. In the aforementioned lecture, only eight deaf people were present, of which two agreed to participate in the research, and, according to their availability and interest, a day, time and place were scheduled to carry out the interviews.

Given the little feedback from participants from Asumar, it was decided to consult the social network Facebook®, with screening by place of residence, identifying possible participants, who were invited via inbox. The invitation to participate in the study was made in person or by video, in Libras, and sent through the social network Facebook® or the multiplatform application WhatsApp®. The invitation video was prepared by the researcher and recorded with the help of an interpreter.

At the end of the meetings aimed at data collection, the indication and contact of known people who could participate in the study were requested. The search for new participants took place until all accessible members within the community were exhausted[9].

In all, 263 deaf people were invited to participate in the research, of which two were excluded because they did not know how to communicate in Libras, and 151 did not accept to participate and/or ignored the invitation sent via inbox on the social network Facebook® or by message on WhatsApp®. Thus, the sample studied was composed of 110 deaf people.

Study protocol

The data were collected by the first author, a nurse, a master's student in nursing, with intermediate training in Libras (carried out five extension courses); and involved the application of an instrument and verification of weight and height. The research protocol included the use of Libras in the reading and completion of the instrument for all participants. To this end, the researcher carried out specific training with an interpreter in Libras, addressing the issues of the data collection instrument.

The instrument used during the interview was a structured questionnaire, prepared by the authors, based on the one used by the Ministry of Health in the Surveillance of Risk and Protection Factors for Chronic Diseases by Telephone Survey (VIGITEL)[10-11]. It consists of 40 questions; most of them, dichotomous, addressing:

a) sociodemographic characteristics: sex, age, education, marital status; per capita income in wages[12], self-reported color; insertion in the labor market;
b) strategies that facilitate communication: age at which communication in Libras began, lip-reading; has oral communication; understands the writing of the Portuguese language; is bimodal bilingual (communicates in Libras and Portuguese); makes use of some type of orthosis (hearing aid or cochlear implant), age at diagnosis of deafness; degree of hearing loss in the best-hearing ear (mild, moderate, profound or severe);
c) access to information on health promotion/disease prevention: has access to information and guidance from health professionals; situations in which you use health services; communication barrier interferes with the search for health services; reason for seeking health care last time; satisfaction with health services; assessment of the quality of access to health information and guidance offered by professionals in general (excellent, good, regular, bad, very bad);
d) lifestyle: alcohol abuse; tobacco use; illicit drug use; insufficient physical activity; weekly consumption of sweet foods; habit of adding salt to foods already served on the plate[13]; frequent feeling of nervousness and stress in recent days; makes daily use of some medication; have a disease, NCD. Which one?

Insufficient physical activity was considered when the individual performed less than 30 minutes, five days a week, of moderate-intensity aerobic physical activity (dance, volleyball/footvolley, swimming, martial arts, cycling, gymnastics in general, walking, water aerobics, walking treadmill, weight training and wrestling) or less than 25 minutes, three days a week, of vigorous physical activity[10] (basketball, tennis, soccer/futsal, treadmill running and aerobics)[14].

To identify abusive use of alcohol, consumption, on the same occasion, of five or more doses for men, and four or more for women, of any alcoholic beverage in the last 30 days (dose = one drink of distilled beverage or a glass of wine, can of beer or half a bottle)[10]. Drug use was considered when the consumption of any type of illicit drug was reported, regardless of the frequency.

Excessive consumption of sweet foods was identified with the question: "How many days of the week do you usually eat sweet foods, such as ice cream, chocolates, cakes, cookies, or sweets?" It was considered excessive when greater than or equal to five days[11].

Weight was verified with the person barefoot and without adornments, on a digital scale, G-TECH, Glass 7®, with a maximum capacity of 150 kg; and height, using an inelastic measuring tape (accuracy of 0.1 cm), affixed to a wall without a baseboard. The Body Mass Index (BMI) was classified as underweight (< 18.5 kg/m^2), eutrophic (18.5-24.9 kg/m^2), overweight (25-29.9 kg/m^2) and obese (> 30 kg/m^2)[15].

Analysis of results and statistics

Data were double-entered into an Excel® spreadsheet. The prevalence and the respective confidence interval (95% CI) of health risk behaviors and health conditions were calculated for binomial distribution in the R software, version 3.6.0. Association analyzes were performed using the Statistical Analysis Software (SAS, Version 9.4).

The "self-report of CNCD" was considered a dependent variable, testing the association with the variables: sociodemographic characteristics, forms of communication, lifestyle, and health risk behaviors. The dependent variable "being bilingual bimodal" was also considered, testing the association with the variables: habit

of adding salt to foods already served on the plate; carrying out routine consultations in the last year; and insufficient physical activity. The odds ratio (Odds Ratio) was adopted as an association measure, with 95% CI calculated based on the adjustment of the logistic regression model. The Kolmogorov-Smirnov test indicated that the numerical variables did not present a normal distribution, being described as median and interquartile range. The significance level adopted for all analyzes was 5% ($\alpha = 0.05$), and associations were considered existing when $p \leq 0.05$.

RESULTS

The age of the 110 participants ranged from 19 to 73 years, median of 32 years (interquartile range = 26.7-32.0). Just over half were female (51.8%), most lived with partners (70%) and were white (62.7%). The diagnosis of deafness occurred around 1 year of age (interquartile range = 1.5-2.0). Communication in Libras around 9 years of age (interquartile range = 4-14); more than half of the participants (67.3%) did not use orthotics, 30.9% used hearing aids, and 1.8% had cochlear implants.

The prevalence of self-reported CNCDs was 43.6%. It is noteworthy that the same person may have reported more than one disease, and the most frequent were arterial hypertension (12.7%), depression (6.4%), diabetes mellitus (5.4%) and respiratory disease (5.4%), with rhinitis reported by four people, asthma by one, and bronchitis also by one person. Hypothyroidism was reported by five people (4.5%); epilepsy, by three (2.7%); and hyperthyroidism, chronic venous insufficiency, chronic gastritis, cardiac arrhythmia, and heart failure, by two people each. In turn, the following were reported by a single person: breast cancer, colon cancer, fibromyalgia, migraine, renal failure, stroke, Chagas disease and hepatitis.

Table 1 shows a higher prevalence of CNCDs in relation to some sociodemographic variables — females, over 50 years old, with lower per capita income, not in the job market, bimodal bilingual, with oral communication or who know lip-reading — however, no statistically significant difference.

A considerable part of those surveyed (34.5%) reported using medications for continuous use. It was found that being bimodal bilingual was a protective factor for the addition of salt in ready-to-eat foods (OR = 0.327; 95% CI = 0.11-0.94, p = 0.0381), and bimodal non-bilingual deaf people had more chances of being sedentary (OR = 2.74; 95% CI = 1.11-6.76, p = 0.0285) (data not shown in table).

It was found that only 29.4% of the deaf reported having had a routine consultation for disease prevention and examinations to identify diseases early in the last year, which was significantly associated with the fact of being bimodal bilingual (OR = 2.70; 95% CI = 1.13-6.41, p = 0.0250). As for the prevalence of health risk behaviors, it was found that 7.3% had already used/used some type of illicit drug; 20.9% were obese, and 30.9% were overweight (data not shown in table).

Table 1 – Prevalence of non-communicable chronic diseases in deaf people, according to sociodemographic variables, Municipalities with the main population arrangement in the metropolitan region of Maringá, Paraná, Brazil, 2019

Variables	Sample n (%)	CNCD Yes n (%)	CNCD No n (%)	(CI 95%)§	p‖
Sex					
Female	57 (51.8)	29 (50.9)	28 (49.1)	(37.3- 64.4)	-
Male	53 (48.2)	19 (35.8)	34 (64.1)	(23.1- 50.2)	0.1138
Age group (years)					
19-29	37 (33.6)	14 (37.8)	23 (62.2)	(22.5-55.2)	-
30- 49	60 (54.5)	26 (43.3)	34 (56.7)	(30.6 56.8)	0.5936
≥ 50	13 (11.8)	8 (61.5)	5 (38.5)	(31.6- 86.1)	0.1451
Per capita income less than half the minimum wage					
Yes	17 (15.5)	9 (52.9)	8 (47.1)	(27.8- 77.0)	-
No	93 (84.5)	39 (41.9)	54 (58.1)	(31.8-52.6)	0.4025
Educational level					
Elementary School Incomplete/complete	21 (19.1)	9 (42.9)	12 (57.1)	(21.8- 66.0)	-
Incomplete/completed high school	60 (54.5)	27 (45.0)	33 (55.0)	(32.1- 58.4)	1.091
Higher education	29 (26.4)	12 (41.4)	17 (58.6)	(23.5- 61.1)	0.941
Entered the job market					
Yes	76 (69.1)	32 (42.1)	44 (57.9)	(30.9- 54.0)	-
No	34 (30.9)	16 (47.1)	18 (52.9)	(29.8- 64.9)	0.6285
Bimodal bilingual					
Yes	34 (30.9)	17 (50.0)	17 (50.0)	(32.4- 67.6)	-
No	76 (69.1)	31 (40.8)	45 (59.2)	(29.6-52.7)	0.369
Has oral communication					
Yes	38 (34.5)	19 (50.0)	19 (50.0)	(33.4-66.6)	-
Sometimes	43 (39.1)	18 (41.9)	25 (58.1)	(27.0-57.9)	0.7389
No	29 (26.4)	11 (37.9)	18 (62.1)	(20.7- 57.7)	0.3263
Can lip read					
Yes	51 (46.4)	24 (47.1)	27 (52.9)	(32.9-61.5)	-
Sometimes	45 (40.9)	20 (44.4)	25 (55.5)	(29.6-60.0)	0.2963
No	14 (12.7)	4 (28.6)	10 (71.4)	(8.4-58.1)	0.2229
Understand television subtitles					
Yes	72 (65.5)	32 (44.4)	40 (55.5)	(32.7-56.6)	-
Sometimes	18 (16.4)	8 (44.4)	10 (55.5)	(21.5-69.2)	0.8859
No	19 (17.3)	8 (42.1)	11 (57.9)	(20.2-66.5)	0.855

Notes: §CI 95% = 95% confidence interval for the prevalence of CNCDs; ‖p: probability of significance; minimum wage in 2019 = R$ 998.00; CNCD: non-communicable chronic diseases.

Table 2 – Prevalence and odds ratio of chronic noncommunicable diseases in deaf people, according to behavioral variables, Municipalities with main population arrangement in the metropolitan region of Maringá, Paraná, Brazil, 2019

Variables	Prevalence of risk behaviors (CI95%)§	Prevalence of CNCD (CI95%)§	CNCD		OR* (CI95%)§	p‖
			Yes n %	No n %		
Smoker						
Yes	10.0 (51.0-17.2)	72.7 (39.0-94.0)	8 (72.7)	3 (27.3)	1	
No	90.0 (82.8-94.9)	40.4 (30.7-50.7)	40(40.4)	59 (59.6)	0.254 (0.064-1.017)	0.0528
Abusive alcohol consumption						
Yes	10.9 (57.6-18.3)	41.7 (15.2-72.3)	5 (41.7)	7 (58.3)	1	
No	89.1 (81.7-94.2)	43.9 (33.9-54.3)	43 (43.9)	55 (56.1)	1.094 (0.325 – 3.687)	0.8847
Insufficient physical activity						
Yes	75.4 (66.3-83.2)	43.4 (32.5- 54.7)	36 (43.4)	47 (56.6)	0.957 (0.399-2.295)	0.9223
No	24.5 (16.8-33.7)	44.4 (25.5- 64.7)	12 (44.4)	15 (55.5)	1	-
Add more salt to ready-to-eat foods						
Yes	15.4 (9.3-23.6)	52.9 (27.8-77.0)	9 (52.9)	8 (47.1)	1	-
No	84.5 (76.4-90.7)	41.9 (31.8-52.6)	39 (41.9)	54 (58.1)	0.642 (0.227-1.812)	0.4025
Weekly consumption of sweet foods						
Not excessive	71.8 (62.4-80.0)	36.7 (26.1- 48.3)	29 (36.7)	50 (63.3)	1	-
Excessive	28.2 (20.0-37.6)	61.3 (42.2-78.1)	19 (61.3)	12 (38.7)	2.730 (1.161-6421)	0.0214*
Often nervous or stressed						
Yes	70.0 (60.5-78.4)	45.4 (34.1-57.2)	35 (45.4)	42 (54.5)	1	-
No	30.0 (21.6-39.5)	39.4 (22.9-57.9)	13 (39.4)	20 (60.6)	0.780 (0.340 – 1.789)	0.5574
Overweight						
Yes	52.7 (43.0-62.3)	46.5 (33.3-60.1)	27 (46.5)	31 (53.4)	1	-
No	47.3 (37.7-57.0)	40.4 (27.0-54.9)	21 (40.4)	31 (59.6)	0.778 (0.365-1.658)	0.5152
Uses health service only when in pain (n = 109)						
Yes	53.2 (43.4-62.8)	36.2 (24.0-49.9)	21 (36.2)	37 (63.8)	1	-
No	46.8 (37.2-56.6)	52.9 (38.5-67.1)	27 (52.9)	24 (47.1)	1.982 (0.920 - 4.270)	0.0806
Seek less health services due to the communication barrier (n = 109)						
Yes	50.5 (40.7-60.2)	38.2 (25.4-52.3)	21 (38.2)	34 (61.8)	1	-
No	49.5 (39.8-59.3)	50.0 (36.1-63.9)	27 (50.0)	27 (50.0)	1.619 (0.756-3.468)	0.2151

*Notes: *OR = Odds Ratio; § 95% CI = 95% confidence interval for the prevalence of NCDs; ‖p: probability of significance; CNCD: non-communicable chronic diseases.*

Of the study participants, 44.9% mentioned not having received guidance from health professionals, and 54% reported dissatisfaction with health services.

Table 2 shows the prevalence of behavioral variables associated with CNCDs, in which the variable "consumption of sweet foods" was the only one significantly associated; and deaf people who reported consuming this type of food more than five times a week were about three times more likely to have CNCDs.

DISCUSSION

The prevalence of self-reported chronic diseases — considering only arterial hypertension and diabetes mellitus — was lower than in the general population. This finding corroborates the result of the VIGITEL survey, 2019[10], which found a prevalence of 24.7% for hypertension, and 7.7% for diabetes. This may be due to the difficulty of communication, which, in turn, implies late and underdiagnosis[16]. It is noteworthy that no Brazilian studies were found on the prevalence of chronic diseases in deaf people, which makes comparisons impossible.

A study carried out with 298 deaf people in the United Kingdom also found a lower prevalence of self-reported cardiovascular disease in this population, in addition to the fact that half of those who reported this condition did not seem to be undergoing adequate treatment[16]. Regarding diabetes mellitus, the authors reported that, although a prevalence similar to that of the general population was found, the deaf were more likely to have inadequate control of glycemic levels and less knowledge about problems resulting from this lack of control[16].

As for health-related behaviors, only the variable "excessive consumption of sweet foods" was associated with self-reported CNCD. However, a study that was concerned with comparing the consumption of sweet foods by deaf people and the general population did not find a significant difference between the two populations[16]. It is noteworthy that the relationship between some behaviors and the emergence/worsening of some chronic diseases is already well established in the literature[2,10,15]. Thus, it is strange that, in the present study, only this variable showed a significant association. However, it is important to highlight that the prevalence of excessive consumption of this type of food found was very high, especially when compared to consumption by the adult population participating in the 2016 VIGITEL survey (71.8% vs. 18%)[11].

The prevalence of other risk behaviors for CNCDs detected in this study is in contrast to the 2018 VIGITEL findings, but, in general, in none of the variables in question was the difference as large as that observed in relation to excessive consumption of sweet foods. For example, in the comparison, the deaf had a lower prevalence in terms of excessive alcohol consumption (10.9% vs. 17.9%). On the other hand, they showed a higher prevalence of smoking (10% vs. 9.3%), obesity (20.9% vs. 19.8%) and insufficient physical activity (75.4% vs. 44.1%)[10]. In any case, the prevalence of these variables is

still better than that found in non-deaf people with chronic disease followed up in specialized care in a regional health center in Paraná[2].

The prevalence of people with obesity and insufficient physical activity was high among those surveyed, which is a cause for concern, as excess weight is directly related to the risk of CNCDs. The result, however, confirms that of the UK study, which identified a high prevalence of overweight and obesity among deaf people, especially those over 65 years of age, but differs in relation to smoking, as it was observed that this habit is lower in people deaf than in those who are not deaf [16].

Research developed in China showed that only 4% of deaf adolescents met the World Health Organization's physical activity recommendations; and highlighted the importance of interventions aimed at the social inclusion of this population[17]. However, one cannot fail to consider that deaf people face communication barriers and stigmas for participation and adherence to sports activities in clubs, gyms and weight loss groups[16]. In this way, the need to develop strategies to increase the level of physical activity of this population is emphasized, because, no matter how small, it has the potential to produce improvements in health due to the benefits for the prevention of chronic diseases - metabolic syndrome, diabetes, cardiovascular and neurodegenerative diseases[18].

Still in the behavioral area, there was a low adherence of respondents to routine consultations, with an association between this practice and the fact that the person being bilingual bimodal was observed. It is noteworthy that half of the participants justified that, due to the communication barrier, they seek health services less. This confirms the result of a study carried out in Rio de Janeiro, in which it was identified that, due to the lack of Libras interpreters or non-deaf companions, 63% of the deaf gave up attending health facilities[3]. Thus, the difficulty of communication negatively interferes with the demand for health services, which, in turn, is substantial for the monitoring of health conditions, early diagnosis and, consequently, the prevention of premature mortality from CNCDs to occur.

In this direction, the fact that it was observed that more than half of the participants (54%) were dissatisfied with the health services and that a considerable portion (45%) reported not having received guidance from health professionals is impacted, but this is not the case. it is data from an isolated context. A qualitative study carried out in the state of Paraíba, with 11 deaf people, found that, from their perspective, sources of information on health are precarious and inefficient, as they only offer primary and in-depth information, which triggers dependence on non-deaf people. for health issues and makes it difficult to take a leading role in relation to self-care[19].

Interestingly, although without a statistically significant difference, there was a higher prevalence of CNCDs in bimodal bilingual deaf people than in those who communicate only in Libras. Furthermore, it was found, as a protective factor for the inappropriate habit of adding more salt to ready-to-eat foods and for a sedentary lifestyle, the fact that the deaf know how to communicate in two linguistic modalities - Libras and Portuguese. It is inferred that this type of communication can facilitate access to health services, since, despite Decree Number 9.656/2018 occurs in most institutions[3].

In the study carried out in Rio de Janeiro, an association was observed between the communicative ability of the deaf and the increase in the chance of them understanding health professionals, their diagnosis and treatment. This chance was greater in bimodal bilingual people, followed by those who used lip reading and those who used oralization, with those who communicated only in Libras having less chance of understanding[3].

The relatively high prevalence of hypothyroidism among study participants may be related to hearing loss (HL), because the presence of thyroid hormone transporters is essential for the good development of cochlear function. Thus, the insufficiency of these elements can manifest itself in the form of HL[20]. Therefore, in deaf people, it is important to investigate the existence of hypothyroidism with the aim of early diagnosis and prevention of possible complications of this pathology.

Although it was not statistically significant, there was a higher prevalence of self-reported CNCDs in female individuals, over 50 years of age, with incomplete secondary education, per capita income less than half the minimum wage and who were not in the labor market. The literature points out as risk factors for CNCDs, in the general population, lower education, older age and male sex[21]. It should be noted that the higher prevalence of CNCDs in women has been attributed to the fact that they seek more health services than men[22], which favors the establishment of a diagnosis.

A study carried out in the United States identified that male and low-income deaf people who were unemployed were more likely to have an inadequate diet, which favors the development of obesity and depression[23] and, consequently, increases the risk of CNCDs[1]. Thus, the development of strategies that guarantee access to information on quality nutritional education and take into account financial insecurity is substantial, enabling and training deaf people with low income and inadequate food for self-management of their health[23].

It is noteworthy that the prevalence of excessive consumption of sweet foods endorses the importance of communication between parents and children, especially with those who have difficulty obtaining information outside the family environment — for example, the deaf. In these cases, the responsibility of parents to pass on information related to health promotion and disease prevention overlaps. Therefore, there is a need for health professionals to provide family members of deaf people with greater access to information of this nature. Thus, parents will be more empowered and will be better able to provide information on these issues with greater ownership. They, in general, can influence their children's health behaviors, through guidance and support for physical activities, healthy eating, leisure time and sleep[24].

In this sense, a study carried out with adolescents in the United States identified the influence of the family in the preventive behaviors of CNCDs, and the high family functioning was associated with lower chances of eating disorders, overweight and obesity[24]. Also, the prevalence of deaf individuals who reported feeling nervous and stressed was very high, which allows us to infer that these symptoms may be related to difficulty in communication, including within the family[8]. This needs to be considered, because such conditions also predispose to diseases such as high blood pressure[25].

Finally, it is important to emphasize that understanding the prevalence and risk factors for CNCDs in the deaf population is complex. It involves difficulties in accessing health care, in communicating

with health professionals — with a lack of understanding or trust in the guidelines received — and also in environmental, social and lifestyle factors. Therefore, deaf people are more likely to develop preventable health problems resulting from underdiagnosis and undertreatment of chronic health conditions.

Therefore, it is important that health services are concerned with meeting all the needs of the deaf population with equity, especially regarding health education, in addition to favoring early diagnosis and adequate treatment of health conditions, with a view to improving quality of life and life expectancy. Therefore, it is essential that health professionals understand the importance of making an effort to have at least reasonable communication with these people and that they also seek strategies that allow them to have adequate health behavior[16].

In this sense, aiming at access to health information with equity, greater satisfaction of the deaf with health services and surveillance in relation to risk behaviors for CNCDs, some strategies should be prioritized: encouraging and supporting the training of health professionals in Libras ; claim the presence of Libras interpreters in services with greater demand; and encourage the use of free platforms for simultaneous translation, through the availability of a free, high-quality Wi-Fi network.

The most prevalent characteristics among the participants of this study who had CNCDs should be considered when promoting improvements in the health of this population. The fact that a higher prevalence of CNCDs was identified among those who are more likely to communicate with the non-deaf population – bimodal bilinguals – (because they communicate in Libras and Portuguese), allows us to infer that the communication barrier is a cause of underdiagnosis. and undertreatment in the deaf who use only Libras in their communication. In this sense, efforts must be made to facilitate this population's access to health services, with equity, especially regarding communication, in order to facilitate early diagnosis, timely treatment and prevention of premature deaths.

Study limitations

Possible limitations of the study stem from the sampling technique used, which does not allow generalizations, from the fact that the CNCDs variables and the degree of hearing loss are self-reported, therefore, subject to measurement bias and participant memory. Also, the study was carried out only with deaf people who communicate through Libras and who had hearing loss/reduction since childhood. However, it is important to remember that this is a public that is difficult to access, either because of the limited demand for health services, or because of the absence of public policies that empower them. Furthermore, this population has its own culture. Thus, the possible limitations of the study do not outweigh its contributions.

Contributions to the area of Nursing, Health, or Public Policy

The results of this study expand the knowledge about the deaf, allowing greater visibility of the problems they face in relation to the health-disease process - a topic that is little discussed in the national and international literature. This knowledge can support discussions on the importance of reorganizing health services, contributing, consequently, to the improvement of health care that is provided to this public, especially with the improvement of nursing practices for them.

CONCLUSION

The prevalence of non-communicable chronic diseases in the studied sample was 43.5%, with a higher percentage among females (50.9% vs. 35.8%). The most frequent CNCDs were: arterial hypertension, depression, diabetes mellitus, respiratory disease and hypothyroidism. The only variable significantly associated with CNCDs was the excessive consumption of sweet foods, with people who reported their consumption more than five times a week being about three times more likely to have CNCDs.

Bimodal bilingual individuals had a higher prevalence of NCDs, probably due to the greater ease of access and communication with health professionals. In fact, being bimodal bilingual was significantly associated with performing routine consultations and examinations to identify diseases early in the last year.

Some health risk behaviors, despite their high prevalence, did not present a statistically significant association with CNCDs: feeling nervous or stressed frequently; to be a smoker; being overweight; and have insufficient physical activity.

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