Voice Disorders in Older Adults Living in Nursing Homes: Prevalence and Associated Factors

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Summary: Objectives. To estimate the prevalence and the associated factors with voice disorders (VDs) in older adults living in nursing homes.

Study design. Cross-sectional.

Methods. A sample of 117 Brazilian individuals of both sexes and preserved cognitive function, aged >59 years, living in 10 nursing homes, was studied. VDs were screened using the validated tool "Rastreamento de Alterações Vocais em Idosos" (RAVI—Screening for Voice Disorders in Older Adults). Associated factors included variables related to socioeconomic and demographic profile; nursing home; general health; ear, nose, and throat conditions; lifestyle; functionality; and psychosocial status. Bivariate analysis was performed by Pearson's chi-square or Fisher's exact test. Multivariate analysis was performed by multiple binomial regression. The significance level was 5%.

Results. The prevalence of VDs was 39.3% (95% confidence interval [CI] = 30.4–48.1). There was no significant difference in prevalence according to age and sex. Multivariate analysis revealed that the prevalence of VDs were independently associated with anxiety symptoms (prevalence ratio [PR] = 1.97, 95% CI = 1.17–3.29), smoking (PR = 1.56, CI = 1.02–2.38), general daily inactivity (PR = 1.62, CI = 1.10–2.38), temporomandibular disorder (PR = 1.68, CI = 1.11–2.54), choking (PR = 1.53, CI = 1.06–2.20), and self-reported hearing loss (PR = 1.52, CI = 1.04–2.21).

Conclusion. VDs are common among older adults with preserved cognitive function living in nursing homes. The associated factors with VDs in this population can be prevented, diagnosed, controlled, or treated. Screening procedures and early intervention should be considered.

Key Words: Voice–Voice disorders–Aging–Prevalence–Nursing homes.

INTRODUCTION

Developing countries have seen a steep increase in the aging population as a result of recent epidemiological and demographic transition processes in these regions.[1] In Brazil, it is estimated that by 2050, the number of people aged ≥60 years will reach 65 million, more than three times that in 2010.[2] With an increasing aging population, there is a growing demand for long-term care for the older adults,[3] and for greater attention to the health conditions that affect this population.[4]

The voice is a crucial component of effective verbal communication, and it is essential for social integration of the older adults.[4–7] Increased longevity and the associated debilitating diseases mean that the elderly population is increasingly susceptible to communication disorders, including voice disorders (VD).[8]

VD may increase functional decline in the older adults,[8] as well have a negative impact on quality of life, autonomy, and effective social participation.[5,8–11] This scenario is especially striking for residents in nursing homes because residents often have limited opportunities to communicate, and the physical and social environment does not favor communication.[12]

Older adults living in nursing homes are often dependent and suffer from multiple functional disabilities[13]; these conditions are unfavorable for voice quality and quality of life.[14] Moreover, studies have indicated that the nursing home residents are more likely to experience conditions related to the worsening of VD, for example, social distancing, lack of affection, loneliness, anxiety, depression, frailty, and dependence in activities of daily living.[7,15]

The prevalence of VD in community-dwelling elderly people ranges from 4.8%[16] to 29.1%.[10] For elderly people living in nursing homes, the prevalence of VD reaches 33% in the United States.[14] A Brazilian study that analyzed the vocal characteristics of 48 elderly nursing home residents found the following features to be common: hoarse voice, reduced loudness, low pitch, and short maximum phonation times.[17] Another descriptive study conducted in Brazil found that 16% of residents (n = 10 of 62) in a single nursing home had vocal complaints.[18] Despite these data, the prevalence and associated factors with VD in older adults living in nursing homes in Brazil are unknown.

Therefore, the aim of this study was to estimate the prevalence of VD in Brazilian older adults living in nursing homes and the associated factors with VD in this population.

METHODS

Study participants

This cross-sectional study included subjects aged >59 years (according to the World Health Organization chronological classification of aging in developing countries) and living in 10 of the 14 nursing homes registered by Health Surveillance in Natal (northeastern Brazil). Of the 10 nursing homes, 5 were privately owned and 5 were nonprofit.

The study included both men and women. The participants had to fulfill the following inclusion criteria: Brazilian

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nationality, living in a nursing home at the time of the study, and preserved cognitive function. Cognitive status was defined according to the result of the Short Portable Mental Status Questionnaire.[19]

Exclusion criteria were as follows: struggling to understand and perform simple instructions, lowered levels of consciousness, severe hearing loss without an electronic device with well-adapted amplification, partial or total laryngectomy, and tracheostomy. The selection procedure occurred in two stages: (1) inspection of registration forms, medical records, and monitoring reports for all residents aged >59 years in each nursing home; and (2) contact with the caregiver or the resident.

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Screening for voice disorder

Screening for voice disorder was carried out using the "*Rastreamento de Alterações Vocais em Idosos*" (RAVI—Screening for VD in Older Adults). The validity and reliability of the RAVI have been verified and published.[20–22] The RAVI questionnaire is considered a quick, risk-free, and inexpensive screening tool that is easy to administer. The questionnaire aims to identify older adults with VD using 10 questions that consider perceptual-acoustic symptoms and vocal discomfort. A total score greater than 2 indicates the presence of voice disorder and indicates that the individual should be tested using a procedure with high specificity to confirm the diagnosis.[22]

Variables

The variables investigated in this study to identify associated factors with VD are found in Appendix. All variables were dichotomized and grouped into seven categories: socioeconomic and demographic; related to nursing home residence; general health; ear, nose, and throat conditions; lifestyle; functionality; and psychosocial status. Depending on the nature of the variable, data were collected either through inspection of the institution's records or through contact with the caregiver or the resident.

Statistical analysis

Descriptive analysis of each variable was performed through absolute and relative distribution. Bivariate analysis was performed by Pearson's chi-square or Fisher's exact test. The magnitude of each combination was calculated using the prevalence ratio (PR) with 95% confidence intervals (CIs).

To test the influence of covariates and identify associated factors with VD in elderly nursing home residents, multiple binomial regression analyses were performed and PRs are presented with their respective 95% CIs.[23]

For inclusion in the model, only variables with a P value <0.20 and at least 10 positive cases of VD in the bivariate analysis were considered. After multicollinearity analysis, only variables with the highest statistical significance and PRs, the lowest CIs, and acceptable theoretical plausibility were retained in the model.

RESULTS

Baseline characteristics

Of the 303 elderly residents registered in the 10 nursing homes surveyed, 117 (38.6%) individuals with a mean age of 79.68 (±7.92) years met the inclusion criteria. The majority of the participants was female (74.4%), aged 80–89 years (46.2%), white (57.3%), single (50.4%), retired (93.2%), and had low education (55.5%). Many of the participants did not have health insurance (59.0%), they had no autonomy in managing their own financial resources (69.1%), and they were living in a nonprofit nursing home (64.1%). The main reasons for institutional care were that there was no caregiver at home (39.3%) or that they were living alone (17.9%).

More than half of the participants (52.1%) were prescribed ≥6 medications. Hypertension and diabetes were frequently reported (53.8% and 28.2%, respectively), along with hyposalivation (44.4%) and temporomandibular disorder (TMD; 22.2%). Conditions related to the ears, nose, and throat included negative self-perception of voice (33.3%), constant use of voice in the workplace in the past (32.5%), self-related hearing loss (28.3%), colds >3 times a year (22.2%), and choking (22.2%).

Many of the participants smoke or have smoked for a year or more (45.3%), do not perform physical activity (66.7%), and have no hobbies (46.2%). However, the majority report having company to talk on a daily basis (68.4%). Many of the participants walk without assistance (60.7%), but most are considered to be frail or prefrail (68.4%), and have moderate dependence overall (46.1%). The prevalence of depressive and anxiety symptoms was 43.6% and 47.9%, respectively.

Prevalence of voice disorders

The prevalence of VD in the study population was 39.3% (95% CI: 30.4–48.1%). Figure 1 shows that the sensation of dry throat and phlegm in the throat were the most common complaints, followed by feeling the voice is tired, feeling the voice gets worse throughout the day, and feeling bothered by the voice.

Table 1 presents the prevalence of VD and their respective 95% CIs for different ages and sex. There was no significant difference in prevalence of VD according to these variables; that is, the prevalence of VD did not change with aging in both sexes.

Associated factors with voice disorders

Initially, bivariate analysis identified association between VD and sinusitis, cold (three times over a year), TMD, hyposalivation, subjective choking, hearing disorder, smoking, perceived general daily inactivity, depressive symptoms, and anxiety symptoms (Table 2). Variables related to socioeconomic and demographic factors, nursing home residence, and function were not significantly associated with VD in the bivariate analysis. Multivariate analysis indicated that anxiety symptoms, smoking, perceived general daily inactivity, TMD, choking, and self-reported hearing loss keep their statistic association with VD in older adults living in nursing homes (Table 2). The adjusted prevalence of VD was 1.68 higher in those subjects with TMD, 1.53 higher in those with subjective choking, 1.52 higher in those with subjective hearing disorder, 1.56 higher in those with a history of smoking, 1.62 higher in older adults who perceived general daily inactivity, and 1.97 higher in participants with anxiety symptoms.