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Original articles

Assessment of smell and swallowing in patients with post-COVID 19 syndrome

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ABSTRACT

Purpose: to evaluate the olfactory and swallowing aspects in patients with post-COVID-19 syndrome.

Methods: the sample comprised 62 individuals aged between 20 and 91 years (52.84 ± 16.45), predominantly males (n=37; 59.68%). They were evaluated by olfactometry (Connecticut test), lip and tongue pressure (PLL equipment from Pró-Fono®), and swallowing assessment, using foods with three different consistencies and two scales, the FOIS and ASHA-NOMS. Descriptive statistics (mean and standard deviation) and inferential statistics (Chi-Square and Student's t-tests) were performed to analyze the results, adopting 5% as statistical significance.

Results: an altered sense of smell was present in 83.71% of the sample, with an average score of 4.26 ± 1.52 points (moderate hyposmia) and impaired swallowing in 16.13% of cases, of which the majority presented functional swallowing. The average pressure values were: for the lips 45.86 (± 19.93) kPa, for the apex of the tongue 31.93 (± 18.45) kPa, and for the dorsum of the tongue 32.28 (± 17.66) kPa.

Conclusion: in the patients with post-COVID-19 syndrome who participated in the sample, it was possible to observe the presence of both olfactory disturbance and dysphagia, although hyposmia prevailed in the group in question. Given the above, it is suggested that in the event of an outbreak of the disease, assessments of smell and swallowing should be carried out routinely, since this virus has not yet been eradicated.

Keywords: COVID-19; Smell; Deglutition; Speech, Language and Hearing Sciences

INTRODUCTION

COVID-19 is a disease caused by the novel coronavirus (SARS-CoV-2), which, due to its very high and rapid transmissibility, has infected and killed thousands of people worldwide. Symptoms range from mild to severe, resulting in a high demand for multidisciplinary intensive care[1]. In March 2020, COVID-19 was characterized as a pandemic condition[2], impacting various global aspects, especially health, the economy, and work, and further exacerbating social inequalities[3].

Regarding health, which is the focus of this study, one of the sequelae caused by the coronavirus includes olfactory and swallowing dysfunctions in individuals who were infected and survived the disease. In terms of olfaction, symptoms may range from anosmia to parosmia and phantosmia, as well as impairments in taste perception. These symptoms cause considerable discomfort to those affected, thereby requiring investigation and professional follow-up[4]. Hyposmia was reported in 5.1%[5] to 74% of cases[6].

Swallowing impairments, in turn, may occur in various scenarios within this viral infection, as some critically ill patients who required intubation and subsequent extubation were left with sequelae in the oropharyngeal musculature, laryngeal innervation, with loss or reduction of sensitivity and mobility, compromising the integrity of stomatognathic functions and resulting in dysphagia. When dysphagia is suspected, patients require specialized professional intervention and dietary modifications to ensure life maintenance, as well as intervention by a multidisciplinary team, including speech-language pathology support[7].

The literature has highlighted speech-language sequelae, particularly those related to language and feeding in post-COVID-19 syndrome[8], which justifies the present study. In light of the above, the objective of this research was to assess olfactory and swallowing aspects in patients presented with post-COVID-19 syndrome.

METHODS

A research project was designed and previously submitted to the Research Ethics Committee of the Federal University of Sergipe, SE, Brazil (CAAE No. 61448422.7.0000.0217; Opinion No. 5.658.792), with all participants providing informed consent and signing the Free and Informed Consent Form (FICF). The study was observational and cross-sectional, configured by convenience sampling, and conducted in the speech-language pathology school clinics of a university in northeastern Brazil. It followed a review of medical records of all patients hospitalized with a COVID-19 diagnosis in two reference hospitals for treating the condition in the state of Sergipe (Hospital Cirurgia de Aracaju/SE and the University Hospital of Lagarto/SE). Initial contact was made by telephone to verify interest in participating in the study.

The attempt to contact individuals who had been hospitalized with severe manifestations of the disease (n = 670) resulted in successful communication with 312 individuals due to several limiting factors (absence of a contact phone number in the patient's record, incorrect number, unsuccessful attempts after multiple calls, or the patient's death). Of these, 102 agreed to participate in the study. Upon acceptance, appointments were scheduled to assess swallowing and olfactory function. A total of 71 individuals were evaluated; however, after applying the eligibility criteria, the final sample comprised 62 patients aged between 20 and 91 years (52.84 ± 16.45), with the majority being male (n = 37; 59.68%). It is important to note that all patients had been infected with SARS-CoV-2 between March 2020 and December 2022, and the assessments were carried out between December 2023 and February 2024 in order to verify potential sequelae related to the study objective (long COVID or post-COVID-19 syndrome).

The following measures were adopted to reduce the risk of bias[9]: (1) delivery of results to a centralized research data team; (2) use of standardized and uniform containers for the olfactory test to prevent participants from identifying the test stimuli; (3) blinding of participants, outcome evaluators, and professionals; and (4) completed test protocols were sealed in numbered brown envelopes by the central data team so that evaluators had no access to the information.

To ensure participant anonymity, individuals initially identified themselves using only their initials when responding to the initial questionnaire, which was later replaced with an alphanumeric code in the database. To minimize the risk of confidentiality breaches, only the responsible researchers—referred to as the "Central Data Team"—were involved in data analysis. Participants who completed the study procedures received individual feedback on their results, and those requiring speech-language therapy were invited to receive treatment at the university's speech-language pathology school clinics.Participants who tested positive for COVID-19 on the day of assessment were excluded from the sample. Confirmed cases were

reported to the Municipal Health Department of the respective municipalities involved, and the patients were referred to the COVID-19 care unit for medical evaluation and appropriate management.

The inclusion criteria were a confirmed history of COVID-19 requiring hospitalization for the treatment of the viral respiratory infection; age over 18 years; and absence of pre-existing olfactory and swallowing dysfunctions, as reported during the oral interview. The exclusion criteria included withdrawal of informed consent; refusal to complete the assessments on the day of evaluation; difficulty responding to oral questions from the administered questionnaires; complaints of cognitive, motor, or speech-language impairments prior to hospitalization; positive COVID-19 test at the time of assessment; and use of medications that could interfere with olfactory or swallowing evaluations.

Regarding the evaluation procedures, all participants underwent COVID-19 antigen testing. For this stage, the team included a supervising pharmacist and two student interns, all of whom used appropriate personal protective equipment (PPE) during sample collection, storage, and handling. The collected material was stored at the temperature recommended by the manufacturer (below 30°C). The sample was obtained from the upper respiratory tract via nasopharyngeal swab, including both nasal and pharyngeal collection, in accordance with the Ministry of Health guidelines[10]. The test results were reported as either "detected" (positive) or "not detected" (negative). Participants with a negative result proceeded to the next stage, which was the anamnesis.

In a quiet and private setting, an oral interview was conducted with each participant. The information was recorded on a designated form and included data on socioeconomic status, identification, and speech-language complaints before and after COVID-19 hospitalization. If the participant reported swallowing complaints, the Eating Assessment Tool (EAT-10)[11] in its Brazilian Portuguese version was administered as a self-assessment instrument for dysphagia risk.

Next, participants underwent olfactory and swallowing assessments. Instrumental assessment of swallowing was performed using a specific protocol developed by the researchers. This protocol included an evaluation of the anatomical structures involved in swallowing biomechanics, as well as a functional assessment using foods of various consistencies (liquid, nectar, honey, and solid) in controlled volumes (3 ml, 5 ml, and 10 ml) to analyze individual performance. An oximeter was positioned on the participant's finger throughout the procedure, and the evaluator performed cervical auscultation using a Littmann® stethoscope.

At the end of the clinical evaluation, individuals were classified according to the speech-language diagnosis as having or not having dysphagia based on the observed alterations. When dysphagia was present, it was classified by severity: mild, moderate, or severe. In addition to the dysphagia diagnosis and its severity, patients were also classified according to the level of oral intake using the Functional Oral Intake Scale (FOIS)[12], translated into Brazilian Portuguese[13], and the American Speech-Language-Hearing Association - National Outcomes Measurement System (ASHA-NOMS) [14], also translated into Brazilian Portuguese[15].

Assessment of lip and tongue pressure was performed using the Biofeedback Pró-Fono®: Lip and Tongue Pressure (LTP®), which measures the pressure exerted by the lips and tongue on an air bulb. The equipment consists of a pressure sensor connected to an electronic board and housed in a plastic case. The pressure sensor is attached to a flexible plastic tube connected to the air bulb device. For each structure assessed, the patient was instructed to exert pressure for three to five seconds in three different trials, with 30-second intervals between each trial, timed by the LTP®.

Results were displayed in three graphs representing the pressure obtained in each attempt and the average. It is important to note that for the lip pressure assessment, the patient was instructed to keep their teeth closed, and the air bulb was positioned between the lips, which the patient was asked to press. For the tongue tip assessment, the bulb was placed on the alveolar ridge, and for the dorsum of the tongue, the bulb was positioned accordingly[16].

For the olfactometry, the Connecticut Chemosensory Clinical Research Center (CCCRC) Smell Test (MedSmell®) was used. This test consists of two components: a quantitative test (to determine the olfactory threshold) and a qualitative test (to identify specific odors). Both procedures involve the use of eight application vials. The nostrils were tested separately, and patients kept their eyes closed with the aid of a blindfold.

Alternating between distilled water and the vial containing butyl alcohol in increasing concentrations (from lowest to highest as needed), the olfactory threshold was defined by four consecutive positive responses at the same concentration. If this criterion

was not met, a higher concentration was tested until the threshold for each nostril was determined. Results were recorded on a designated form.

Seven odors (coffee, soap, cinnamon, peanut candy, chocolate, talcum powder, and mothballs) were presented from the corresponding test kit, and the patient was asked to name each one. The eighth and final vial was used to test the function of the trigeminal nerve (cranial nerve V), with the patient being asked whether or not they could perceive the smell of menthol. Results were transcribed into a specific form, and the total points from the right and left nostrils were added together. The final score was then divided by four, yielding a score ranging from seven to zero points. According to the test parameters, normosmia is indicated by a score between seven and six points; hyposmia between five and two points (mild: 5–5.75; moderate: 4–4.75; severe: 2–3.75); and anosmia between zero and 1.75 points.

Data were entered into spreadsheets using Microsoft Office Excel 2013. Statistical analysis was performed using descriptive statistics to calculate means and measures of dispersion (standard deviation), as well as inferential statistics using the Chi-square and Student's t-tests. A significance level of 5% was adopted.

RESULTS

The comparison between study variables obtained from the anamnesis and the evaluation results (Table 1) revealed that the only statistically significant difference was related to the complaint of swallowing alteration post-COVID-19 and the swallowing assessment. Table 2 presents the overall results of olfactory and swallowing alterations, and the individual results of the study participants are shown in Chart 1.

There was no statistically significant relationship between participants' age and complaints related to swallowing ($p = 0.355$) or olfaction ($p = 0.526$), nor between age and objective alterations in swallowing ($p = 0.401$) or olfaction ($p = 0.324$). The same was observed for the relationship between gender and complaints of swallowing ($p = 0.061$) and olfaction ($p = 0.213$), as well as between gender and actual alterations in the swallowing ($p = 0.381$) and olfactory ($p = 0.572$) evaluations—all analyzed using the Student's t-test.

Most participants exhibited olfactory disorders, while a minority presented swallowing disorders. Nine patients (14.52%) had normal results in both olfactory and swallowing functions. According to the statistical analyses, the only significant association identified was between the complaint of swallowing difficulty and the presence of an actual alteration, as shown in Chart 1.

Table 1. Results of statistical analyses of the study variables

Studied Variables	Assessment Result		Total	P-Value
Smoking	**Normosmia**	**Alteration**		
No	8	29	41	0.657[a]
Yes	3	17	21	
Total	11	46	62	
Olfactory Assessment Result	**Complaint of Anosmia**		**Total**	**P-Value**
	No	**Yes**		
Alteration in the test	38	13	51	0.238[a]
Normosmia	10	1	11	
Total	48	14	62	
Swallowing Assessment Result	**Complaint of Swallowing Difficulty**		**Total**	**P-Value**
	No	**Yes**		
Alteration	5	5	10	<.001[a]
Normal	48	4	52	
Total	53	9	62	

Source: Authors.
Caption: a = Chi-square test

Table 2. Results of olfactory and swallowing assessments in post-COVID-19 hospitalized patients

Assessed Items / Results		Number	Percentage
Olfactory	Normosmia	10	16.13
	Olfactory Disorder	52	83.87
Swallowing	Normal	52	83.87
	Altered	10	16.13

Fonte: autores.

Chart 1. Results of the assessments of smell, swallowing and lip and tongue pressure of the research participants

No	Age	Gender	Average on the Connecticut Test	Olfactory Classification	FOIS	ASHA-NOMS	Swallowing Classification	LTP LIP (kPa)	LTP Tongue Apex (kPa)	LTP Tongue Back (kPa)
1	40	Masculine	4.5	Moderate hyposmia	7	7	Normal	35.12	47.54	46.31
2	43	Masculine	6.5	Normosmia	7	7	Normal	56.47	49.56	31.95
3	52	Feminine	6.5	Normosmia	7	7	Normal	48.84	13.31	16.77
4	60	Masculine	1.8	Severe hyposmia	7	7	Normal	9.6	15.94	14.91
5	55	Masculine	2.75	Severe hyposmia	7	7	Normal	37.71	27.19	31.24
6	39	Masculine	4.25	Moderate hyposmia	7	7	Normal	51.97	41.05	29.48
7	54	Masculine	3.5	Severe hyposmia	7	7	Normal	49.59	38.45	19.96
8	74	Masculine	1.8	Anosmia	7	7	Normal	32.27	36.61	33.01
9	33	Masculine	4.75	Moderate hyposmia	7	7	Normal	38.73	25.22	41.21
10	47	Masculine	4.25	Moderate hyposmia	6	5	Functional Swallowing	51.84	24.17	20.58
11	57	Masculine	5.25	Mild hyposmia	7	5	Functional Swallowing	48.66	22.5	16.61
12	57	Masculine	4.0	Mild hyposmia	7	7	Normal	32.82	25.63	15.29
13	30	Feminine	5.75	Mild hyposmia	7	7	Normal	48.63	13.6	21.28
14	73	Feminine	7.0	Normosmia	7	7	Normal	9.52	9.15	39.69
15	53	Feminine	5.5	Mild hyposmia	7	7	Normal	10.18	15.72	16.69
16	76	Masculine	4.75	Moderate hyposmia	7	7	Normal	39.29	68.02	44.94
17	34	Masculine	2.5	Severe hyposmia	7	6	Functional Swallowing	24.03	8.25	12.45
18	53	Feminine	4.5	Moderate hyposmia	7	7	Normal	42.42	23.11	22.26
19	46	Feminine	3.5	Severe hyposmia	6	6	Functional Swallowing	60.39	26.6	50.9
20	50	Masculine	3.0	Severe hyposmia	7	7	Normal	26.83	46.88	56.06
21	37	Masculine	6.25	Normosmia	7	7	Normal	45.76	19.32	19.26
22	56	Masculine	3.25	Mild hyposmia	7	7	Normal	42.12	37.05	24.83
23	31	Masculine	5.25	Mild hyposmia	7	7	Normal	98.14	83.28	89.91
24	60	Masculine	5.25	Mild hyposmia	7	7	Normal	52.32	32.7	56.41

No	Age	Gender	Average on the Connecticut Test	Olfactory Classification	FOIS	ASHA-NOMS	Swallowing Classification	LTP LIP (kPa)	LTP Tongue Apex (kPa)	LTP Tongue Back (kPa)
25	50	Masculine	4.0	Moderate hyposmia	7	7	Normal	61.71	34.23	24.33
26	42	Masculine	6.0	Normosmia	7	7	Normal	37.82	33.0	42.42
27	83	Feminine	4.0	Moderate hyposmia	7	7	Normal	63.01	25.08	74.74
28	58	Feminine	5.75	Mild hyposmia	7	5	Moderate Dysphagia	20.4	0	0
29	85	Masculine	4.0	Moderate hyposmia	7	7	Normal	45.1	11.05	14.06
30	67	Feminine	5.5	Mild hyposmia	7	7	Normal	46.13	9.38	17.99
31	66	Masculine	1.5	Anosmia	7	7	Normal	46.85	22.59	24.54
32	69	Feminine	5.5	Mild hyposmia	7	7	Normal	53.74	45.1	32.5
33	54	Feminine	5.75	Mild hyposmia	7	7	Normal	58.32	18.87	15.31
34	75	Feminine	3.75	Severe hyposmia	7	7	Normal	36.1	8.92	5.46
35	56	Masculine	5.25	Mild hyposmia	7	7	Normal	21.86	27.24	14.44
36	35	Masculine	4.0	Moderate hyposmia	7	7	Normal	51.31	27.15	32.08
37	57	Masculine	3.25	Severe hyposmia	7	7	Normal	60.81	40.84	34.5
38	66	Feminine	6.0	Normosmia	7	7	Functional Swallowing	28.68	22.23	19.33
39	42	Masculine	3.25	Severe hyposmia	7	7	Normal	13.23	7.19	6.98
40	37	Masculine	3.75	Severe hyposmia	7	7	Normal	79.0	48.84	40.83
41	58	Masculine	4.0	Moderate hyposmia	7	7	Normal	55.86	41.34	49.28
42	37	Masculine	4.25	Moderate hyposmia	7	7	Normal	20.08	22.81	27.1
43	53	Masculine	6.75	Normosmia	7	7	Normal	34.9	27.92	47.2
44	35	Masculine	4.0	Moderate hyposmia	7	7	Normal	50.45	14.74	14.84
45	40	Feminine	2.75	Severe hyposmia	7	7	Normal	37.2	50.33	47.74
46	23	Feminine	4.75	Moderate hyposmia	7	7	Normal	60.6	57.63	51.48
47	65	Masculine	1.5	Anosmia	7	7	Normal	112.9	22.29	45.34
48	20	Feminine	3.0	Severe hyposmia	5	6	Functional Swallowing	34.46	75.21	45.47
49	33	Feminine	6.75	Normosmia	7	7	Normal	65.24	41.33	30.56
50	62	Feminine	6.25	Normosmia	7	7	Normal	46.32	47.69	57.45
51	82	Masculine	1.2	Anosmia	6	6	Functional Swallowing	64.41	52.57	53.45
52	80	Feminine	5.25	Mild hyposmia	7	7	Normal	33.37	56.53	43.96
53	91	Feminine	3.0	Severe hyposmia	7	7	Normal	31.38	15.18	10.91
54	55	Feminine	2.5	Severe hyposmia	7	7	Normal	19.76	10.13	15.37
55	73	Feminine	3.0	Severe hyposmia	7	7	Normal	27.11	34.97	32.83

No	Age	Gender	Average on the Connecticut Test	Olfactory Classification	FOIS	ASHA-NOMS	Swallowing Classification	LTP LIP (kPa)	LTP Tongue Apex (kPa)	LTP Tongue Back (kPa)
56	30	Masculine	6.25	Normosmia	7	7	Normal	62.86	42.72	43.49
57	41	Masculine	6.0	Normosmia	6	7	Functional Swallowing	73.52	67.92	23.82
58	63	Feminine	2.75	Severe hyposmia	7	7	Normal	42.71	14.79	16.72
59	32	Masculine	3.75	Severe hyposmia	7	7	Normal	44.51	31.41	31.19
60	37	Masculine	4.5	Moderate hyposmia	7	6	Functional Swallowing	62.73	18.25	31.85
61	55	Feminine	3.0	Severe hyposmia	7	7	Normal	74.99	30.36	44.28
62	59	Feminine	1.25	Anosmia	7	7	Normal	70.79	70.79	65.5

Captions: ASHA-NOMS= American Speech-Language-Hearing Association - National Outcomes Measurement System, FOIS= Functional Oral Intake Scale, kPa=kilopascal, LTP= lip and tongue pressure.
Source: Authors.

Lip PLL values ranged from 9.52 to 112.9 kPa (mean: 46.85 ± 20.31 kPa – p-value: 0.857); tongue tip values ranged from 0 to 83.28 kPa (mean: 33.12 ± 19.07 kPa – p-value: 0.977); and tongue dorsum values ranged from 0 to 89.91 kPa (mean: 32.65 ± 18.02 kPa – p-value: 0.349). None of these revealed statistically significant differences in relation to the swallowing alterations, according to the Student's t-test.

DISCUSSION

This study aimed to evaluate the olfactory and swallowing aspects resulting from COVID-19, as these may be present in severe cases as sequelae of the condition. Regarding olfaction, the literature[5,6] indicates olfactory dysfunctions, justifying the need for multidisciplinary healthcare for these patients.

Although the olfactory response in patients infected with the virus may range from absence to total loss, one study indicated the possibility of regression of this dysfunction within two weeks after infection[17]. However, symptoms may persist for a more extended period. A study conducted with a population from the northern Netherlands (n = 167,729) identified persistent symptoms in post-COVID-19 participants between 90 and 150 days after infection, such as chest pain, respiratory difficulties, pain when breathing, muscle aches, tingling in the extremities, a lump in the throat, alternating sensations of heat and cold, heavy arms or legs, and general fatigue. Olfactory or taste dysfunctions were observed in 8.1% of moderate cases and 7.6% of moderately severe cases[18]. In the present study, the percentage of participants with hyposmia was high, reinforcing olfactory alteration as a sequela of infection by the virus in question.

Additionally, the complaint reported by one patient of a «lump in the throat» may have been due either to prolonged orotracheal intubation—considered a predictor of dysphagia—or to the sample size, which may account for the variability in sequela percentages. Furthermore, depending on the individual's level of exposure to SARS-CoV-2, the prevalence of hyposmia may be higher, as suggested in the literature[17], with a percentage close to that found in the present study. It is also worth noting that many patients who demonstrated olfactory alterations had not reported it as a complaint, underscoring the importance of evaluating this function in patients with severe manifestations of the disease.

The presence of hyposmia in COVID-19 patients is attributed to the migration of SARS-CoV-2 to the nervous system, affecting human olfactory neurons, as confirmed by autopsy and in vitro studies. Chemosensory dysfunction has been linked to cerebral involvement[19]. Regarding swallowing, the literature[20] reports that COVID-19 affects structures responsible for the integrity of this process, such as respiratory compromise, microvascular thrombosis, and neurological dysfunction. Additionally, prolonged intensive care can make patients particularly susceptible to swallowing impairment. Given these factors, it is evident that the involvement of stomatognathic muscle

structures and neuromotor control leads to varying degrees of dysphagia, which may depend on intubation duration, tracheostomy, and delays in seeking professional care.

In an effort to generate a comparative database, scientific findings[20] have shown that 90% of patients required modifications to oral intake, 59% needed alternative feeding routes in combination with oral feeding, and 36% required exclusive alternative feeding without oral intake, highlighting that this study was conducted during the acute phase of the disease.

Based on these premises, the present study was able to gather a small number of post-COVID-19 patients for inclusion. Nevertheless, previous scientific findings support the central hypothesis under investigation, as swallowing difficulties emerged as potential manifestations related to coronavirus infection, given that this condition directly affects the individual's entire stomatognathic system and, consequently, its functions. For this reason, post-infection patients require a multi-professional approach to rehabilitate the affected functions and restore quality of life. In the present study, it was confirmed that patients with swallowing complaints also presented swallowing dysfunction, which differed from self-perception regarding olfaction. Reports of lower quality of life may explain this result, the frequent need to alter food consistency for oral intake, and the severity of these difficulties, as reported in the literature[21].

The possibility of swallowing difficulties in patients with COVID-19 is associated with the need for coordination between breathing and swallowing; thus, when breathing is compromised, there is an increased risk of maintaining safe swallowing[22]. It is essential to highlight that the presence of dysphagia in such cases is associated with a high probability of death[23], requiring specialized multi-professional care. This risk is further increased by the presence of comorbidities, age, the need for intubation and/or tracheostomy, and the phase in which the evaluation is conducted (e.g., the acute phase in a hospital bed). One study[20] found that mild oropharyngeal dysphagia was the most prevalent in its sample, which supports the findings of the present research. In any case, its presence compromises the quality of life of the affected individual and may lead to social isolation and phagophobia, reflecting psychological suffering related to eating.

Regarding lip and tongue pressure, some considerations must be made. Alterations in tongue tone may interfere with orofacial myofunctional performance and impair an individual's quality of life. Moreover, the suprahyoid musculature plays a vital role in swallowing, as it is involved in laryngeal elevation[24]. Therefore, for proper function to occur, the integrity of these structures must be maintained. However, coronavirus infection reduces the efficiency of these regions and interferes with the coordination and muscle tone necessary for executing a critical action in the swallowing process. It is noteworthy that there are no existing studies that have evaluated lip and tongue pressure in patients affected by COVID-19, which limits comparisons between the present findings and those of other authors. Nonetheless, compensatory mechanisms may have led to increased lip pressure to generate sufficient intraoral pressure for swallowing. Another relevant point concerns the inefficiency of tongue pressure (both at the tip and dorsum) in the only participant who presented with moderate dysphagia. This inefficiency can be explained by a maxillomandibular discrepancy, as noted in the literature[16], which was not the case here, or by the dysphagia itself, most likely resulting from altered tongue strength. Impairments in tongue tension and strength may lead to slow and inefficient manipulation of the food bolus, delayed swallow initiation, and prolonged oral transit time, with outcomes Similar to those seen in patients with post-stroke swallowing difficulties[25].

The importance of treating both swallowing difficulties and olfactory disorders in post-COVID-19 patients lies in the impact these functions have on human quality of life. Swallowing complaints impacted the Mental Health domain in the self-assessment of quality of life, particularly in aspects such as sleep, meal duration, and fatigue[21]. As such, this difficulty directly compromises vital functions as well as the individual's interaction with their environment by generating dysfunctions in their neurosensory and proprioceptive senses, something not always observed with olfactory impairments. Nevertheless, the literature[19,26] reveals a high prevalence of memory disturbances, depression, anxiety, and fatigue in patients with long-term olfactory loss due to COVID-19. These variables were not analyzed in the present study.

One limitation to note concerns the difficulty of composing the sample, highlighting the need for better clinical documentation by healthcare professionals. As a suggestion, longitudinal follow-up of patients with long COVID syndrome would be ideal to verify whether functions return over time or whether ongoing multidisciplinary care is required.

CONCLUSION

In post-hospitalization COVID-19 patients who participated in this study, the presence of both olfactory disorders and dysphagia was identified, although hyposmia was more prevalent within this group. In light of these findings, it is recommended that olfactory and swallowing assessments be routinely performed in suspected or confirmed cases of the disease, in order to implement appropriate interventions as early as possible, given that coronavirus is among the viral infections that can affect and compromise human health.

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Individual de-identified participant data (sex and age) may be shared indefinitely, provided access is granted directly through Revista CEFAC, which holds the copyright to the publication, and that the request is made by researchers in the field. However, those who use the shared data must commit to citing the original authors of the present study.