# **ARQUIVOS EM** ODONTOLOGIA

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# Covid-19 pandemic: training caregivers to oral health care in nursing homes

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Aim: To assess the associated factors with oral hygiene practices of functionally dependent older adults by professionals working in long-stay elderly care homes during the COVID-19 pandemic.

Methods: This was an exploratory study with a sample of 179 elderly care home professionals recruited through social media groups, applying "snowball" method. Data collection was performed using a structured questionnaire. The outcome variable was the practice of oral hygiene provided by caregivers to functionally dependent elderly individuals, including oral and denture hygiene. The independent variables included sociodemographic characteristics (sex, age group, education, race/skin color), professional performance (professional function and years of experience), training (for caregiving and oral health), elderly care home structure (availability of Personal Protective Equipment), working process (oral health protocols/guidelines), and perception of professional practices (Concerns about transmitting COVID-19 and feelings of being able to deal with cases of COVID-19, as well as the capacity to perform oral hygiene in dependent older adults). The association between the independent variables and oral hygiene practices was analyzed using Logistic Regression (p < 0.05).

Results: Of the 179 professionals, 76.0% performed oral hygiene on the functionally dependent older adults, and 42.5% reported difficulties, including a lack of cooperation from the elders, a lack of time during working hours, and a lack of material. Professionals who received caregiver training for older adults (OR = 3.27, 95% CI 1.53 - 6.98) and those who were trained to perform oral hygiene in this age group (OR = 2.19, 95% CI 1.01 – 4.79) showed higher odds of performing oral hygiene in functionally dependent older adults.

Conclusion: Oral hygiene practices were conducted in long-stay elderly care homes during the COVID-19 pandemic. Training caregivers of dependent older adults can enhance the provision of oral health care.

**Uniterms:** Oral Health. COVID-19. Aged. Long-Term Care.

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#### INTRODUCTION

The World Health Organization declared COVID-19, caused by Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2), a pandemic in March 2020<sup>1</sup>. Until the end of April 2021, nearly 150 million cases of COVID-19 and more than 3 million COVID-19 related deaths were confirmed worldwide (https://covid19.who.int/).

Older adults are at greater risk of COVID-19 complications and have a high mortality risk due to COVID-19. In addition to age, chronic conditions and frailty are factors associated with poor prognosis of COVID-19<sup>2</sup>. Thus, the COVID-19 pandemic has had devastating effects on functionally dependent older adults living in long-stay elderly care homes. A previous systematic review including

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data of 214,380 older adults from 8,502 long-stay elderly care homes showed a COVID-19 attack rate of up to 45% and a fatality rate of 23%<sup>3</sup>.

Residents of long-stay elderly care homes commonly depend on care, including oral hygiene. Microorganisms that colonize the mouth are associated with aspiration pneumonia, and adequate oral hygiene care is essential to reduce the risk of the disease<sup>4</sup>. Poor oral conditions are also related to complications of dementia5. Therefore, caregivers working in long-stay elderly care homes play an important role in maintaining the oral health of older adults. However, those professionals are at a higher risk of coronavirus contamination due to aerosols from oral hygiene procedures, increasing the transmission between older people and professionals, as well as cross-contamination among elderly residents.

The control guidelines for COVID-19 dissemination in long-stay elderly care homes have not addressed oral health care during the pandemic<sup>6</sup>. It is unclear how the oral hygiene practices of dependent older adults occurred in this context, especially in those countries experiencing higher rates of COVID-19. Longstay elderly care homes have faced different challenges since the beginning of the COVID-19 pandemic, such as a lack of human resources, caregivers' work overload, and the fear of contamination of elderly residents. This may have led to a low priority in oral health care over the long term. This study aimed to assess the factors associated with oral hygiene practices among dependent older adults by professionals working in long-stay elderly care homes during the COVID-19 pandemic.

#### MATERIAL AND METHODS

# STUDY DESIGN

This was an exploratory study reported according to the Checklist for Reporting Results of Internet e-Surveys (CHERRIE)<sup>7</sup>.

# **POPULATION AND SAMPLE**

The target population of this study consisted of professionals working in care tasks of dependent older adults living in long-stay elderly care homes in Brazil, such as elderly caregivers, nurses, nursing assistants, physical therapists, and social workers. Dependent older adults were defined as those who required supervision to perform Basic Activities of Daily

Living (BADLS)<sup>8</sup>. Professionals with an internet connection to access the online questionnaire were eligible to participate. Those not currently working in long-stay elderly care homes, such as professionals involved in-home care or hospitals, were excluded.

A non-probabilistic sample was recruited, combining a convenience sample with the snowball technique. The recruitment process began by directly inviting professionals from long-stay elderly care homes who collaborated in previous studies with the researchers. The snowball technique was then applied, in which each respondent should inform potential new participants and so on. The survey was also disseminated through social media, such as Whatsapp®, Instagram®, and Facebook®, using a promotional YouTube video at https://www. voutube.com/watch?v=QDUb23U81AA. This video was also directed to private webpages of groups of professionals working in long-stay elderly care homes.

#### **DATA COLLECTION**

Data were collected between June and December 2020, when the COVID-19 pandemic in Brazil was characterized by high transmission levels and ongoing challenges to control the spread and meet the population's needs. On 08/27, Brazil had 3,761,391 confirmed cases (up 259,416 in 7 days), an incidence rate of 1789.9 cases per 100,000 inhabitants. The number of deaths reached 118,649 (up 6,345 in 7 days), indicating a mortality rate of 56.5 deaths per 100,000 inhabitants and a fatality rate of 3.2%9. The COVID-19 vaccine was not yet available to the people at this time. An online questionnaire (e-survey) known by the Jotform® platform (https://www.jotform.com/) was used for data collection. Completing the questionnaire was mandatory before submission to avoid receiving incomplete data. Participants could review and change their answers during the completion of the questionnaire.

# **QUESTIONNAIRE**

A structured questionnaire was developed for data collection. The 45 questions were grouped into (i) sociodemographic characteristics, (ii) professional performance and training, (iii) structure of the long-stay elderly care homes, (iv) working process, (v) perception of professional practice, and (vi) performing oral health care for the older people. The content validity of the questionnaire was carried out by

a committee comprised of six experts with dental or nursing backgrounds from health services and universities with experience in elderly care. The panel of experts assessed the clarity of the items, suitability of response options, relevance, and language clarity of the questionnaire. None of the items was rated as inappropriate by the experts. Items and response options assessed as partially adequate were reviewed for language clarity. The experts were asked to provide suggestions and comments on items considered inadequate or partially adequate. The questionnaire's organization, flow, and length (size) were also evaluated and improved following the experts' recommendations.

#### **VARIABLES**

Oral hygiene practices in dependent elderly people in the context of the COVID-19 pandemic was the intended outcome of the study, which was assessed by the following questions: 'Do you routinely provide oral and dental hygiene for dependent elderly individuals?" (Yes, No) and 'Do you routinely provide hygiene of the removable dental prosthesis of dependent elderly people?' (Yes, No). The two items above were grouped into a dummy outcome variable for analytical purposes as follows: 0 = does not perform oral hygiene nor dental prosthesis hygiene, 1 = performs oral hygiene and/or dental prosthesis hygiene.

Sociodemographic characteristics were age, sex, educational level, race/skin color. The age was assessed in complete years of life and dichotomized into young adults (18 to 39 years old) and mature adults (> 40 years old). The level of education was assessed by the highest school level completed in the Brazilian educational system, with the following response options: I did not study in school (zero years of study), Elementary school (1st grade or primary), High school (2nd grade or high school), Youth and Adult Education (YAE), Vocational training (technical education, technical course), Completed higher education (undergraduate degree), and Postgraduate (specialization, Master's, Doctorate). Due to the low frequency of individuals who reported a lower level of educational, these categories were grouped into "up to secondary school" (I did not study in school + Elementary school + High school + Youth and Adult Education). Skin color/race was assessed according to Brazilian Institute of Geography and Statistics (IBGE), with the response options of White, Black, Yellow, Brown, and Indigenous.

Professional performance variables

included the number of years involved in older people care (< 1 year; 2 to 5 years; 6 to 10 years; > 11 years) and professional role in the long-stay elderly care home (elderly caregiver, nursing staff, other healthcare professional). The professionals answered two questions regarding training: (i) Have you taken any courses for elderly caregivers? (Yes, short-term course (lasting a few days); Yes, long-term course (lasting several months); No), (ii) Have you undergone any training for oral cleaning/oral hygiene of older people? (Yes, No). For the statistical analysis of the data, the categories related to the duration of caregiver courses were grouped, as only a few professionals had completed courses lasting only a few days.

The availability of full Personal Protective Equipment (PPE) was used to assess the structure of the long-stay elderly care homes. Full PPE was considered when gloves, surgical masks, N95 masks, aprons, goggles, and face shields were available. Working process variables assessed different aspects of the protocols and measures adopted during the COVID-19 pandemic related to oral health care. The variables included adopting new control procedures to restrain the spread of coronavirus, availability of guidelines or protocols for oral hygiene practices in longstay elderly care homes, and the adoption of new oral hygiene practices considering the COVID-19 pandemic. The questions for evaluating these variables were as follows: After the arrival of the COVID-19 pandemic in Brazil, did the institution for older people where you work implement any measures to contain the spread of COVID-19? (Yes, No), Did the institution where you work have any guidance/policy/guide for performing the oral cleaning of older people's teeth/mouth/ dentures? (Yes, No), After the arrival of the coronavirus pandemic, did the institution where you work implement new measures for carrying out oral hygiene for older people? (Yes, No)

The professionals' perception of their practices during the COVID-19 pandemic was evaluated using the following questions: (i) During the pandemic, how often were you concerned about transmitting the disease to the elders? (ii) Do you feel qualified to deal with potential cases of COVID-19 in the institution for the elders where you work? For these two questions, the answer options were never, rarely, sometimes, frequently, and always, dichotomized for statistical analysis as never/rarely/sometimes and always/often. The professionals also reported their capacity to perform oral hygiene in dependent elderly individuals through the question: How easy

do you find it to perform oral hygiene for older people? (easy/very easy, difficult/very difficult).

Those professionals who reported difficulties in performing the oral hygiene of older adults answered questions concerning the possible barriers to do so, including a lack of cooperation of the older adult, a lack of knowledge, a lack of time, and a lack of oral care products to perform oral hygiene.

#### STATISTICAL ANALYSIS

Descriptive statistics was performed through absolute and relative frequencies for the categorical variables. The association between independent variables and oral hygiene practices in dependent older adults was assessed using crude and multivariable logistic regression to estimate the odds ratio (OR) and 95% confidence intervals. Multivariable modeling included only explanatory variables presenting a p-value < 0.25 in the unadjusted analysis due to the study's exploratory nature. The final multivariable model retained independent variables statistically associated with the outcome with p < 0.05. The Hosmer-Lemeshow evaluated the goodness of fit of the adjusted regression model. Data analysis was performed using the Stata program 16.0 (Stata Corp., College Station, TX, USA).

#### **RESULTS**

The online questionnaire reached 1,577 views, and 187 people completed and submitted

the questionnaire. Of them, eight responses were excluded, as they were completed by professionals who did not work in long-stay elderly care homes, resulting in a final sample of 179 participants. Most of the professionals were from the nursing staff team (38.5%), followed by elderly caregivers (36.9%) and other healthcare professionals (24.7%). The latter included social workers (3.9%), physical therapists (2.8%), nutritionists (1.7%), psychologists (1.1%), occupational therapists (1.1%), speech therapists (0.6%), dentists (0.6%), and physicians (0.6%).

Most participants were between 18 and 39 years of age, female, and had up to a secondary education (30.7%) (Table 1). Nearly half of the professionals reported working less than 5 years in older adult care, and 55.3% had not undergone training to perform oral hygiene. Availability of full PPE in long-stay elderly care homes was reported by more than 60% of the participants, and most institutions adopted new control procedures to restrain the spread of the coronavirus. The availability of guidelines or protocols for oral hygiene practices in long-stay elderly care homes was reported by nearly 70% of the participants, and most care homes did not adopt new oral hygiene practices considering the COVID-19 pandemic. Nearly 42% of the participants reported performing oral hygiene in dependent older adults as difficult or very difficult. The concerns about transmitting COVID-19 to older adults were reported by 83.3% of the participants, though most of them were able to deal with COVID-19 cases.

**Table 1.** Sample characteristics, frequency of performing oral hygiene, and crude and adjusted association of sociodemographic characteristics, professional performance and training, structure of long-stay elderly care homes, working process, and perception of professional practice with oral health practices.

(continues)

Variables	n (%)	Perform oral hygiene, n (%)	Crude OR (95% IC)	p-value		
Sociodemographic characteristics						
Age group						
18 - 39 years	115 (64.25)	88 (76.52)	1			
≥ 40 years	64 (35.75)	48 (75.00)	0.92 (0.45 – 1.87)	0.819		
Sex						
Female	156 (87.2)	117 (75.00)	1			
Male	23 (12.8)	19 (82.61)	1.58 (0.51 – 1.58)	0.428		
Educational level						
Up to secondary school	55 (30.73)	49 (89.09)	1			
Vocational training	32 (17.88)	30 (93.75)	1.84 (0.35 – 9.69)	0.474		
Higher education	41 (22.9)	23 (56.10)	0.16 (0.05 – 0.45)	0.001		
Postgraduate	51 (28.5)	34 (66.67)	0.24 (0.09 – 0.68)	0.007		

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Race/skin color							
White	73 (40.78)	53 (72.60)	1				
Yellow, brown, black	106 (59.22)	83 (78.30)	1.36 (0.68 – 2.72)	0.381			
Professional performance an	d training						
Number of years involved in older adult care							
< 1 year	26 (14.53)	19 (73.08)	1				
2 - 5 years	75 (41.90)	57 (76.00)	1.17 (0.42 – 3.22)	0.766			
6 - 10 years	49 (27.47)	36 (73.47)	1.02 (0.35 – 2.99)	0.971			
≥ 11 years	29 (16.20)	24 (82.76)	1.77 (0.48 – 6.46)	0.389			
Received caregiver training for elderly people							
No	50 (27.9)	28 (56.00)	1				
Yes	129 (72.1)	108 (83.72)	4.04 (1.95 – 8.37)	<0.001			
Received training to perform oral hygiene							
No	99 (55.3)	68 (68.69)	1				
Yes	80 (44.7)	68 (85.00)	2.58 (1.22 – 5.45)	0.013			
Structure of the long-stay eld	lerly care homes						
Availability of full Personal Protective Equipment							
No	110 (61.5)	85 (77.27)	1				
Yes	69 (38.5)	51 (73.91)	0.83 (0.41 – 1.68)	0.609			
Work process							
Adoption of new control procedures to restrain the spread of coronavirus							
No	20 (11.17)	19 (95.00)	1				
Yes	159 (88.83)	117 (73.58)	0.14 (0.19 – 1.12)	0.098			
Availability of guidelines or protocols for oral hygiene practices							
No	53 (29.61)	97 (76.98)	1				
Yes	126 (70.39)	39 (73.58)	0.83 (0.40 – 1.74)	0.627			
Adoption of new oral hygiene	practices conside	ring the COVID-19 pa	andemic				
No	140 (78.2)	104 (74.29)	1				
Yes	39 (21.8)	32 (82.05)	1.58 (0.64 – 3.90)	0.318			
Perception of professional pr	ractice						
Concerns about transmitting COVID-19 to the elderly people							
No	30 (16.8)	24 (80.00)	1				
Yes	149 (83.3)	112 (75.17)	0.76 (0.29 – 1.99)	0.573			
Feelings of being able to dea	I with cases of CO	VID-19 in the long-sta	ay elderly care homes				
No	55 (30.7)	42 (76.36)	1				
Yes	124 (69.3)	94 (75.81)	0.97 (0.46 – 2.04)	0.936			
Capacity to perform oral hygi	Capacity to perform oral hygiene in dependent elderly people						
Difficult or very difficult	76 (42.5)	51 (67.11)	1				
Easy or very easy	103 (57.6)	85 (82.52)	2.31 (1.15 – 4.65)	0.018			

Most professionals (n = 136, 76.0%) reported performing oral hygiene or hygiene of the dental prosthesis of the dependent older adults. Difficulties in performing oral hygiene in older adults were reported by 76 participants (42.5%). The main barriers were a lack of cooperation of the older adults (93.2%), a lack of knowledge (35.6%), a lack of time (29.3%), and a lack of oral care products (27.6%).

The frequency of professionals working on care tasks of dependent older adults living

in long-stay elderly care homes who performed oral hygiene according to independent variables is presented in Table 1. In the unadjusted logistic regression, educational level, receiving caregiver training for older adults, receiving training to perform oral hygiene, and capacity to perform oral hygiene were associated with the professional practice of oral hygiene and/or dental prostheses hygiene of dependent older adults (Table 1). Professionals who received caregiver training for older adults (OR = 3.27, 95% CI 1.53–6.98)

and those who received training to perform oral hygiene (OR = 2.19, 95 % CI 1.01–4.79) showed

higher odds for performing oral hygiene in dependent older adults (Table 2).

**Table 2.** Adjusted association of independent variables with oral health practices.

Variables	Adjusted OR (95% CI)	p-value
Received caregiver training for older adults		
No	1	
Yes	3.66 (1.75-6.98)	0.001
Received training to perform oral hygiene		
No	1	
Yes	2.22 (1.02-4.79)	0.043

Hosmer-Lemeshow test: 0.63, p value = 0.4277

#### DISCUSSION

This study examined the professional oral hygiene practices in long-stay elderly care homes in Brazil during the COVID-19 pandemic. Our findings suggest that even though professional oral hygiene in dependent older adults was a common procedure, the professionals reported difficulties and barriers to performing oral hygiene in this population. Furthermore, professional oral hygiene in dependent older adults was associated with receiving caregiver training as well as receiving training to conduct oral hygiene. Previous research also showed that most professionals in elderly care homes perform oral hygiene of the dependent residents<sup>10</sup>. The most common barrier was the lack of cooperation of the older adults, which is consistent with a systematic review.<sup>10</sup> Responsive behaviors of residents, such as shouting, verbal threats, and pushing, are frequent among older adults with dementia. Training in person-centered communication approaches is a strategy aimed at overcoming this barrier<sup>11</sup>.

The dearth of PPE during the COVID-19 pandemic informed by most of the participants was also previously reported. It may have interfered with oral hygiene practices, since 83% of the professionals reported the fear of being infected and transmitting the disease to residents or their relatives. The lack of PPE on the market due to a steep increase in hospital demand can be interpreted as an additional barrier to performing professional oral hygiene in older adults due to the increased perception of the risk of contamination<sup>4</sup>. The adoption of new guidelines to contain the spread of COVID-19 at the elderly care homes observed in this study was a common strategy in most countries. However,

our findings and previous evidence indicate that most institutions did not incorporate professional oral hygiene practices in those guidelines<sup>6</sup>.

Oral hygiene in older adults was more commonly performed by caregivers who received formal training to look after this age group. However, only about one-third of the caregivers reported receiving such training. Most caregivers interviewed in a previous survey in Brazil, especially those who worked in philanthropic institutions, reported having acquired hands-on professional skills and not through a vocational course<sup>12</sup>. Our findings highlight the need for training caregivers and professionals working in elderly care homes and offering continuing education programs. They may include training and mentoring programs as well as the provision of educational materials. Those strategies would enhance their practical skills and competencies to provide comprehensive care for older adults.

Interventions aiming to improve the skills of professionals working in elderly care homes have been tested, such as those addressing oral health, hygiene, infection control, nutrition, prevention of pneumonia, drug prescription, reduction of falls, and management of behavioral and psychological symptoms of dementia<sup>13</sup>. Interventions targeting specific care practices tend to be more successful than those requiring global practice changes<sup>13</sup>. Thus, training professionals to perform oral health care for older adults is a relevant enabling factor to provide adequate oral care for this population group<sup>11</sup>.

In this study, around half of the participants received training to perform oral hygiene, suggesting that caregiver training might not include specific training to perform oral care. This finding was similar to studies in

other countries, such as Singapore<sup>14</sup>, France<sup>10</sup>, and Finland<sup>15</sup>, and revealed the low priority of oral health care for older adults living in care homes. The greater frequency of professional oral hygiene among functionally dependent older adults was associated with undergoing training. Educational interventions with elderly caregivers can improve the quality of oral care in elderly care homes since previous studies have shown short-term positive effects on the oral health of older people. However, there is a need for robust evidence on the effect of these interventions in the long-term.

Online data collection was necessary in this study because of the COVID-19 pandemic and the social distancing measures due to Brazil's high number of cases and deaths. Online surveys can be useful to generate hypotheses that need to be confirmed in a more controlled environment. The main limitations of this study include the low sample size and the possible selection bias. Although the sample included participants from all regions of Brazil, it is not representative of the target population, compromising the external validity. Using a convenience sample with the snowball technique may have introduced a selfselection bias of participants. The participants may be more engaged with elderly care than those professionals who did not answer the questionnaire, leading to more positive responses than if a probabilistic sample was chosen.

While no studies that compared the oral care practices in long-term care homes before and after the pandemic have been identified, it is believed that the observed results during this period may have significant implications, even beyond the pandemic. The study underscores the need to improve training and education for caregivers and professionals in elderly care homes. The fact that only about one-third of the caregivers reported receiving specific training for oral care emphasizes the importance of continuous education programs. The emphasis on caregivers performing oral hygiene, especially those with formal training, suggests that promoting effective oral care practices remains essential.

Additionally, the barriers related to the lack of cooperation from older people, especially those with dementia, highlight the need for person-centered communication approaches to overcome these challenges. Finally, the research also highlights the importance of incorporating oral hygiene practices into guidelines and protocols for elderly care, something many institutions have yet to do. The lessons learned during the

pandemic can aid in guiding new researchers in this field to generate evidence that contributes to the enhancement of oral health care for older individuals and, in turn, contribute to their longterm quality of life.

#### CONCLUSION

This study demonstrated that oral hygiene practices were commonly carried out in elderly care homes in Brazil during the context of the COVID-19 pandemic. Professional training provided for caregivers of older adults, including oral care training, can improve the provision of oral health care for this population group.

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# CREDIT – AUTHORSHIP CONTRIBUTION STATEMENT

Conceptualization and design of the study, LGR and RCF; Analysis and interpretation of data, LGR, RCF, CAGC, AAS, MVV; Supervision, RCF; Writing – original draft, LGR; Writing – review & editing, LGR, RCF, CAGC, MVV, AAS. All authors read and approved the final manuscript.

#### **CONFLICT OF INTEREST**

The authors declare no conflicts of interest.

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# Pandemia da COVID-19: capacitação dos cuidadores e a provisão de cuidados bucais aos idosos que vivem em Instituições de Longa Permanência

**Objetivo:** Avaliar os fatores associados às práticas de higiene bucal de idosos dependentes por profissionais que atuam em instituições de longa permanência para idosos (ILPI) durante a pandemia de COVID-19.

Métodos: Estudo exploratório com amostra de 179 profissionais de ILPI recrutados por meio de grupos de mídia social e utilizando o método "bola de neve". Coleta de dados foi realizada empregando questionário estruturado. A variável resposta foi a prática de higiene bucal dos idosos dependentes por cuidadores, incluindo a realização de higiene bucal e de próteses. As variáveis independentes foram características sociodemográficas (sexo, faixa etária, escolaridade, raça/cor de pele), atuação (função da ILPI e tempo de atuação) e formação profissional (curso/treinamento para cuidador e em relação à saúde bucal), estrutura da instituição (disponibilidade de Equipamentos de Proteção Individual), processo de trabalho (protocolos/diretrizes de saúde bucal existentes na ILPI) e percepção sobre as práticas profissionais (Preocupações em transmitir e de ser capaz de lidar com casos de COVID-19, e de ser capaz de realizar higiene bucal dos idosos). A associação entre as variáveis independentes e as práticas de higiene bucal foi analisada por Regressão Logística (p < 0,05).

**Resultados:** Dos 179 profissionais, 76,0% realizavam a higiene bucal dos idosos dependentes e 42,5% relataram dificuldades, como falta de cooperação do idoso, falta de tempo no turno de trabalho e falta de material. Os profissionais que possuíam formação para atuarem como cuidadores de idosos (OR = 3,27, IC 95% 1,53 – 6,98) e os que foram treinados para realizar higiene bucal nessa faixa etária (OR = 2,19, IC 95% 1,01 – 4,79) apresentaram maior chance de realização da higiene bucal em idosos dependentes.

Conclusão: Práticas de higiene bucal foram realizadas em ILPI durante a pandemia de COVID-19. A formação de cuidadores de idosos dependentes pode potenciar a prestação de cuidados de saúde bucal.

Descritores: Saúde Bucal. COVID-19. Idoso. Assistência de Longa Duração.