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Bathroom Behaviors Regarding Oral Hygiene Items During COVID-19 Home Isolation: A Cross-Sectional Study in Southern Brazil

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ABSTRACT

Objective: To describe behaviors with oral hygiene items in single-bathroom households during the domiciliary isolation of individuals with positive 'Reverse transcriptase polymerase chain reaction' (RT-PCR+) in southern Brazil. **Material and Methods:** Cross-sectional study was conducted with Research and Monitoring Sector of COVID-19 data from Palhoça, Brazil, of individuals aged ≥ 18 years, living in a single-bathroom household, who had an RT-PCR positive. A link of Google Forms was used. Socio-demographic information, characteristics during the home isolation, oral hygiene, and behaviors with oral hygiene items in the bathroom were collected. Descriptive stratified analyses according to age were conducted (<40 and ≥ 40 years). **Results:** Among 524 individuals, 36% were aged ≥ 40 years. During isolation, according to the behaviors with oral hygiene items in the household single-bathroom, 70% (95%CI 64.9-75.5) of the youngest participants reported sharing toothbrushes in the same container and 30% (95%CI 24.4-35.1) of the oldest; use of the same toothpaste was reported by 67% (95%CI 62.8-71.7) of the youngest and 33% (95%CI 28.3-37.3) of the oldest participants. For the outcome of sharing the same toothpaste, the chances for the youngest and the oldest to share the same toothbrush container was 11 times and 6 times more, respectively. **Conclusion:** The individuals related good oral hygiene habits; however, behaviors with oral hygiene items in the bathroom were neglected, especially by the younger individuals.

Keywords: Preventive Dentistry; Oral Hygiene; Toothbrushing; Coronavirus.

Introduction

The COVID-19 pandemic, related to the transmissibility of Severe Acute Respiratory Syndrome-Coronavirus2 (SARS-CoV-2), has caused worldwide concerns due to its characteristic of remaining viable in small aerosol particles for long periods and its transmissibility potential [1]. From April 2022, according to the World Health Organization, SARS-CoV-2 transmission has reached more than 491 million people worldwide [2]. In Brazil, more than 30 million cases have been confirmed [3].

It is recognized that the virus is transmitted by direct contact and spreads from an infected person through small droplets when coughing, sneezing, talking, singing or breathing [4]. The oral cavity has been considered a significant gateway for SARS-CoV-2 due to its relationship with the respiratory tract, as well as the presence of saliva [4,5].

SARS-CoV-2 has the ability to persist for up to 72 hours on surfaces such as metal, glass or plastic, considered fomites, as has been evidenced in literature [6-8]. Temperature and humidity are critical factors for the survival of the virus and its permanence in drier environments is two days, while at temperatures between 22°C and 25°C with 40-50% relative humidity, its survival is estimated for up to 5 days [9-11].

Sharing the same bathroom among cohabitants can be a risk factor for the spread of the virus, derived from urine, feces or vomit and, by the possible hand-to-mouth transmission, since frequently touched surfaces can be contaminated, in addition to the potential for aerosols released through toilet flushing [12,13].

Irregular behaviors with oral hygiene items among cohabitants in single-bathroom households have been reported as a possible risk for COVID-19 contamination [13,14]. It is known that the toothbrush is considered a reservoir of opportunistic pathogens with great potential for cross and hematogenous infections [15]. The American Dental Association recommends not sharing toothbrushes and exchanging them after the infectious process period [16].

According to literature, social and demographic factors can shape a person's beliefs, habits and behaviors with oral health care throughout life; for example, the authors reported that an increase in tooth brushing frequency could occur particularly among those aged over 40 years [17]. On the other hand, for adolescence, carelessness is justified by transitory physiological and psychological changes, with consequences exploring and challenging oneself and one's environment, rules and behaviors, including for oral health [18].

Health organizations have provided protocols related to general guidelines aimed at preventing, controlling, and reducing the transmission of COVID-19, such as not sharing personal objects, cell phones, masks, cups and cutlery, among others, are included. In addition to encouraging hand washing or sanitizing with 70% alcohol gel or others before handling food and objects, however, no concerns were observed regarding behaviors with oral health items in shared bathrooms [19-21]. In addition, strategies and approaches for adherence to protocols were not explored, particularly for adolescents and young adults. This highlights the importance of analyzing whether young people recognize primary care, especially in the bathroom.

There is a potential risk of SARS-CoV-2 infection related to oral hygiene items stored in bathrooms, and adherence to protocols and guidelines during COVID-19 social isolation is essential. Therefore, according to age, we aimed to describe behaviors with oral hygiene items in the bathroom of individuals who tested RT-PCR+, between July and November 2020, in a municipality in southern Brazil.

Material and Methods

Study Design and Sample

This cross-sectional study used data from the Epidemiological Surveillance System and the COVID-19 Research and Monitoring Sector of the Municipality of Palhoça (MCOVID-19), Southern Brazil. Palhoça is a municipality part of the metropolitan region of Florianópolis, the state's capital of Santa Catarina. The estimated population of the city is 175,272 inhabitants.

The target population of the retrospective study consisted of all individuals aged 18 years or older residing in the municipality who had confirmed positive results in the Real-Time Polymerase Chain Reaction (RT-PCR) test between July and November 2020. The sample first comprised a list of all patients with a positive RT-PCR test for COVID-19, and a text message was sent via the WhatsApp social network: "Have you been sharing a one-bathroom residence? Respondents who lived in households with a single bathroom were considered eligible. The second stage consisted of a questionnaire to be filled in on the Google Form platform for those who positively responded to the previous question. The final sample size included all eligible participants who responded to the questionnaire between January and March 2021 (Figure 1).

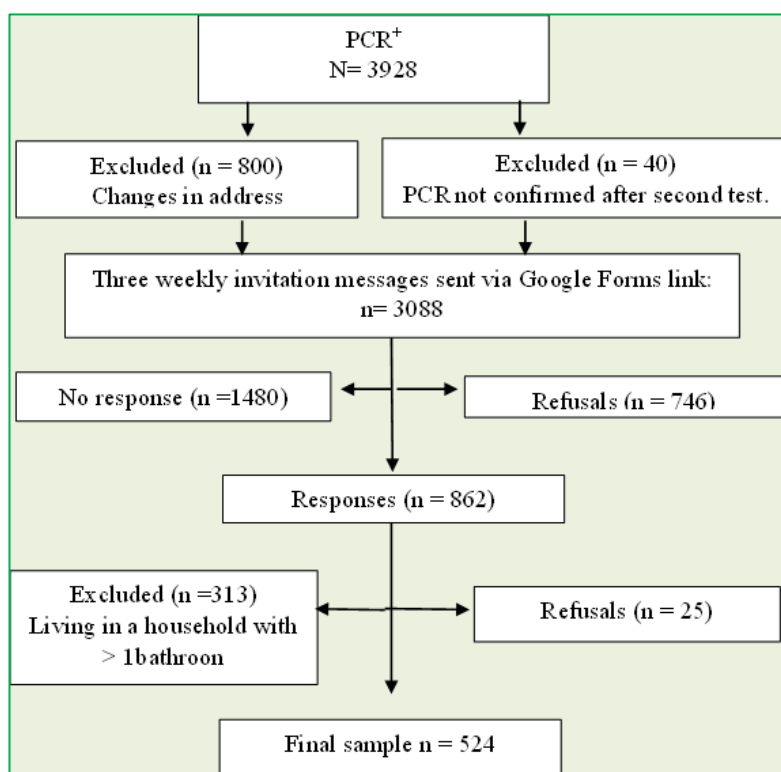


Figure 1. Flowchart of sample selection.

Data Collection

Data collection was carried out through an anonymous online questionnaire. For the present study, participants' sociodemographic information, such as age (years), sex, schooling (≥ 12 , 9-11 and ≤ 8 years) and number of people in the household, was collected. The characteristics of the home isolation period were based on González-Olmo et al. [14]: staying in an isolated room most of the time, sharing glasses, plates and cutlery and sharing face and bath towels as dichotomous variables no / yes. In addition to information on oral hygiene behaviors: tooth brushing frequency (twice or more per day, once every day, not every day, never); use of mouthwash (No / Yes), tongue brushing (every day, not every day, never) and flossing (No/Yes). Disinfection care and other types of behaviors during home isolation were collected in a dichotomized way and consisted of using a proper container to store the toothbrush, sharing toothpaste, storing the toothbrush in an upright

position, using protective brush head cover; toothbrush disinfection with bleach; keeping the toilet lid open, visiting the dentist during the isolation period and toothbrush replacement after the home isolation period.

Data Analysis

Descriptive analysis was conducted for groups <40 years and ≥ 40 years. Prevalence under the study was tested by Pearson's chi-square ($p < 0.05$). We performed univariable and multivariable logistic regression to assess the association between each explanatory variable and the outcome, sharing the toothpaste (yes/no).

Ethical Clearance

This study was approved by the Research Ethics Committee of the University of South Santa Catarina, under protocol number 4.478.577.

Results

It was observed that 64% of participants were in the youngest group; 68% of both groups were female, and more than 80% had ≥12 years of schooling. More than 70% of the youngest and oldest participants reported living with three individuals or more in the same house. During the home isolation period, 67% reported remaining isolated most of the time. According to the protocol for not sharing objects during isolation, 49.4% of the oldest participants reported not having shared drinking glasses, crockery, or cutlery with cohabitants and 32.5% bath and face towels; among the younger ones, 54.7% and 33.9%, respectively (Table 1).

According to oral hygiene habits during home isolation, more than 90% of both groups reported brushing their teeth frequently, and 45% did not use mouthwash. Tongue brushing during isolation was more frequently reported among the youngest participants (91.4%) and more than 70% of both groups used dental floss regularly. Almost all participants (97%) reported not sharing their toothbrushes with cohabitants. Regarding the vertical position of the toothbrush, more than 80% of both groups reported not storing the toothbrush this way. As for the protective brush head cover, its use was reported by over 1/3 of the participants. In addition, 70% of participants reported not keeping the toilet lid open. In both groups, almost 90% reported non-disinfecting their toothbrushes during home isolation. After home isolation, most participants did not replace their toothbrushes with new ones. Regarding the visit to the dentist during home isolation, less than 1% of participants responded positively (Table 1).

Table 1. Sample characteristics of the demographics, behaviors protocol during isolation, oral hygiene habits and bathroom behaviors according to age.

Variables	<40 Years		≥40 Years	
	N (%)	IC 95%	N (%)	IC 95%
Sex				
Male	108 (32.1)	27.3-37.3	61 (32.4)	26.1-39.4
Female	228 (67.9)	62.6-72.6	127 (67.6)	60.5-73.8
Schooling (years)				
≥9	237 (93.1)	89.9-95.4	230 (82.9)	76.8-87.7
≤ 8	15 (6.9)	4.6-10.1	40 (17.1)	12.3-23.2
Number of cohabitants				
2	77 (22.9)	18.7-27.7	54 (28.7)	22.6-35.6
≥ 3	259 (77.1)	72.2-81.2	134 (71.3)	64.3-77.3
Staying in an isolated room				
Most of the time	228 (67.9)	62.6-72.6	127 (67.5)	60.5-73.8
No	108 (32.1)	27.3-37.3	61 (32.5)	26.1-39.4

Avoid sharing drinking glasses, crockery or cutlery				
Yes	152 (45.3)	39.9-50.6	95 (50.6)	43.3-57.6
No	184 (54.7)	49.3-60.0	93 (49.4)	42.3-56.6
Avoid sharing bath and face towels				
Yes	222 (66.1)	60.8-70.9	127 (67.5)	60.5-73.8
No	114 (33.9)	29.0-39.1	61 (32.5)	26.1-39.4
Frequency of toothbrushing				
Twice /once a day	245 (97.6)	95.3-98.8	258 (93.1)	88.4-95.9
Not every day/No, never	7 (2.4)	1.2-4.7	14 (6.9)	4.1-11.6
Use of mouth rinsing				
Every day/not every day	138 (55.1)	49.7-60.3	151 (55.3)	48.1-62.3
No, never	114 (44.9)	39.7-50.3	121 (44.7)	37.7-51.9
Frequency of tongue brushing				
Every day/ not every day	232 (91.4)	87.8-93.9	230 (82.4)	76.3-87.3
No, never	20 (8.6)	6.1-12.2	42 (17.6)	12.7-23.7
Use of dental floss				
Yes	245 (72.9)	67.8-77.4	144 (76.5)	69.9-82.1
No	91 (27.1)	22.5-32.1	44 (23.5)	17.8-30.0
Sharing toothbrush				
No	328 (97.6)	95.3-98.8	183 (97.3)	93.7-98.8
Yes	8 (2.4)	01.1-04.6	5 (2.7)	01.1-06.2
Sharing toothbrush container				
No	103 (40.2)	35.1-45.5	138 (55.3)	48.1-62.3
Yes	149 (59.8)	54.5-64.9	134 (44.7)	37.7-51.9
Sharing toothpaste				
No	38 (15.2)	11.7-19.4	63 (26.6)	20.7-19.4
Yes	214 (84.8)	80.6-88.3	209 (73.4)	66.6-79.3
Toothbrush disinfection during the home isolation				
Yes	12 (6.3)	4.1-9.4	31 (11.7)	7.8-17.2
No	240 (93.7)	90.6-95.9	241 (88.3)	82.8-92.2
Storing toothbrush in the upright position				
Yes	275 (81.8)	77.3-85.6	156 (82.9)	76.8-87.7
No	61 (18.2)	14.3-22.6	32 (17.1)	12.2-23.1
Placing toothbrush on the washbasin				
No	201 (59.8)	54.4-64.9	119 (63.3)	56.1-69.9
Yes	135 (40.2)	35.0-45.5	69 (36.7)	30.0-43.8
Used of protective cap for toothbrush bristles				
Yes	129 (38.4)	33.3-43.7	82 (43.6)	36.6-50.8
No	207 (61.6)	56.2-66.6	106 (56.4)	49.1-63.3
Toilet lid open				
No	242 (72.0)	66.9-76.5	137 (72.9)	66.0-78.7
Yes	94 (28.0)	23.4-33.0	51 (27.1)	21.2-33.9
Toothbrush replacement after the isolation period				
No	202 (60.1)	54.7-65.2	114 (60.6)	53.4-67.3
Yes	134 (39.9)	34.7-45.2	74 (39.4)	32.6-46.5
Dental visit during the isolation period				
No	328 (97.6)	95.3-98.8	173 (92.0)	87.1-95.1
Yes	8 (2.4)	01.1-04.6	15 (8.0)	04.8-12.8

Significant differences in prevalence were observed, considering oral habits; for the oldest participants, less frequent toothbrushing (61.9%; IC95% 39.7-80.1) and tongue brushing (53.2%; IC95%40.7-65.3) were observed when compared to the youngest participants. However, while storing toothbrushes in the same container, 70.5% (95%CI 64.9-75.5) of the youngest participants reported doing so, as reported by 29.5% (95%CI 24.4-35.1) of the oldest participants. Regarding sharing the same toothpaste, proportions were 67.4% (95%CI 62.8-71.7) for the youngest participants and 32.6% (95%CI 28.3-37.3) for the oldest participants. The proportion of negative answers among the youngest participants was almost double for toothbrush disinfection with bleach. The oldest participants reported using dental services more frequently (65.2%; IC95% 43.8-81.9) (Table 2).

Table 2. Prevalence of characteristics and protocol behaviors during isolation, oral hygiene habits and bathroom behaviors according to age.

Variables	<40 Years		≥40 Years		p-value*
	N (%)	IC 95%	N (%)	IC 95%	
Sex					0.943
Male	108 (63.9)	56.4-70.8	61 (36.1)	29.2-43.6	
Female	228 (64.2)	59.1-60.1	127 (35.8)	30.9-40.9	
Schooling (years)					<0.001
≥9	312 (66.8)	62.4-70.9	155 (33.2)	29.1-37.6	
≤8	23 (41.8)	29.5-55.3	32 (58.2)	44.7-70.5	
Number of cohabitants					0.141
2	77 (58.8)	50.1-66.9	54 (41.2)	33.1-49.9	
≥3	259 (65.9)	61.1-70.5	134 (34.1)	29.6-38.9	
Staying in an isolated room					0.943
Most of the time	228 (64.2)	62.6-72.6	127 (35.8)	27.3-37.3	
No	108 (63.9)	56.4-70.8	61 (36.1)	30.9-40.9	
Avoid sharing drinking glasses, crockery or cutlery					0.244
Yes	152 (61.5)	55.3-67.4	95 (38.5)	32.6-44.7	
No	184 (66.4)	60.6-71.8	93 (33.6)	28.2-39.4	
Avoid sharing bath and face towels					0.730
Yes	222 (63.6)	58.4-68.5	127 (36.4)	31.5-41.6	
No	114 (65.1)	57.8-71.9	61 (34.9)	28.1-42.2	
Frequency of toothbrushing					0.011
Twice /once a day	328 (65.2)	60.9-69.3	175 (34.8)	30.7-39.1	
Not every day/No, never	8 (38.1)	19.9-60.3	13 (61.9)	39.7-80.1	
Use of mouth rinsing					0.954
Every day/not every day	185 (64.1)	58.3-69.3	104 (35.9)	30.6-41.7	
No, never	151 (64.2)	57.9-70.1	84 (35.8)	29.9-42.1	
Frequency of tongue brushing					0.002
Every day/ not every day	307 (66.5)	62.0-70.6	155 (33.6)	29.4-37.9	
No, never	29 (46.8)	34.7-59.2	33 (53.2)	40.7-65.3	
Use of dental floss					0.356
Yes	245 (62.9)	58.1-67.7	144 (37.1)	32.3-41.9	
No	91 (67.4)	59.0-74.8	44 (32.6)	25.2-40.9	
Sharing toothbrush					0.844
No	328 (64.2)	59.9-68.2	183 (35.8)	31.8-40.1	
Yes	8 (61.5)	33.3-83.7	5 (38.5)	16.3-66.7	
Sharing toothbrush container					0.001
No	135 (56.5)	50.1-62.7	104 (43.5)	37.4-49.9	
Yes	201 (70.5)	64.9-75.5	84 (29.5)	24.4-35.1	
Sharing toothpaste					0.001
No	51 (50.5)	40.8-60.2	50 (49.5)	39.8-59.2	
Yes	285 (67.4)	62.8-71.7	138 (32.6)	28.3-37.3	
Toothbrush disinfection during the home isolation					0.029
Yes	21 (48.8)	34.2-63.6	22 (51.2)	36.4-65.8	
No	315 (65.5)	61.1-69.6	166 (34.5)	30.4-38.9	
Storing toothbrush in the upright position					0.745
Yes	275 (63.8)	59.1-68.2	156 (36.2)	31.8-40.9	
No	61 (65.6)	55.3-74.6	32 (34.4)	25.4-44.7	
Placing toothbrush on the washbasin					0.434
No	201 (62.8)	57.4-68.0	119 (37.2)	32.0-42.6	
Yes	135 (66.2)	59.4-72.4	69 (33.8)	27.6-40.6	
Used of protective cap for toothbrush bristles					0.242
Yes	129 (61.1)	54.4-67.5	82 (38.9)	32.5-45.6	
No	207 (66.1)	60.7-71.2	106 (33.9)	28.8-39.3	
Toilet lid open					0.835
No	242 (63.9)	58.8-68.6	137 (36.2)	31.4-41.1	
Yes	94 (64.8)	56.7-72.2	51 (35.2)	27.8-43.3	

Toothbrush replacement after the isolation period					0.907
No	202 (63.9)	58.5-69.1	114 (36.1)	30.9-41.5	
Yes	134 (64.4)	57.7-70.7	74 (35.6)	29.3-42.3	
Dental visit during the isolation period					0.003
No	328 (65.5)	61.2-69.5	173 (34.5)	30.5-38.8	
Yes	8 (34.8)	18.1-56.2	15 (65.2)	43.8-81.9	

*Pearson's chi-square test.

According to logistic regression, for the outcome of sharing the same toothpaste, the likelihood for the youngest and oldest participants to share the same toothbrush container was 11 times and six times more, respectively, when compared with their peers (Table 3).

Table 3. Unadjusted and adjusted logistic regression stratified by < 40 years and ≥40 years.

Variables	<40 Years			≥40 Years		
	OR Unadj (95%CI)	OR Adj* (95%CI)	p-value	OR Unadj (95%CI)	OR Adj* (95%CI)	p-value
Schooling (years)			0.838			0.552
≥9	Ref.	Ref.		Ref.	Ref.	
≤8	1.21 (0.34-4.24)	1.15 (0.30-4.39)		0.92 (0.39-2.15)	1.35 (0.51-3.61)	
Use of dental floss			0.554			0.271
Yes	Ref.	Ref.		Ref.	Ref.	
No	1.41 (0.69-2.90)	1.28 (0.56-2.86)		1.31 (0.59-2.90)	1.67 (0.67-4.17)	
Frequency of tongue brushing			0.340			0.187
Every day/ not every day	Ref.	Ref.		Ref.	Ref.	
No. never	0.85 (0.31-2.33)	0.56 (0.17-1.85)		0.67 (0.30-1.51)	0.52 (0.20-1.37)	
Sharing toothbrush container			<0.001			<0.001
No	Ref.	Ref.		Ref.	Ref.	
Yes	11.28 (5.09-24.95)	12.1 (5.35-27.32)		6.44 (2.81-14.71)	6.83 (2.92-16.03)	
Toothbrush disinfection during the home isolation			0.075			0.881
Yes	Ref.	Ref.		Ref.	Ref.	
No	0.42 (0.15-1.13)	0.34 (0.11-1.12)		0.75 (0.29-1.96)	0.92 (0.32-2.65)	
Dental visit during the isolation period			0.666			0.122
No	Ref.	Ref.		Ref.	Ref.	
Yes	1.26 (0.16-10.45)	1.63 (0.18-15.01)		0.38 (0.13-1.10)	0.38 (0.11-1.30)	

*Adjusted for all variables.

Discussion

The findings of this study showed that reports of adherence to home care protocols during the home isolation period due to COVID-19, such as avoiding sharing personal items, was practically less than 50%. However, regular oral hygiene care habits were reported by participants. When considering behaviors with oral hygiene items in single-bathroom households, higher proportions were observed for irregular behaviors among the youngest participants.

Over 60% of the youngest and oldest participants shared bath and face towels, and at least 45% shared drinking glasses, crockery, or cutlery. According to the literature, the SARS-CoV-2 virus has been detected in utensils during food preparation, dining table, kitchen surface and water dispenser [21,22]. In addition, these results evidenced failures to comply with basic recommended protocol measures for home isolation [23].

In this study, tooth and tongue brushing prevalence was more significant among the youngest participants in home isolation than the oldest. According to the literature, these findings were different; it seems to increase tooth brushing frequency, particularly among those over 40 years [17]. On the other hand, one of the virus transmission routes is the mouth, mainly the tongue, which is an extensive reservoir of viral germs. The high bacterial and viral load can increase complications of systemic diseases, such as pneumonia and acute

viral respiratory infections. Patients with severe infections caused by COVID-19 also manifested systemic infections [24]. Therefore, tooth brushing, flossing, and tongue cleaning efficiently reduce the viral load in the oral cavity [25,26] and prevent infection [15,27].

The significant difference showed that 49% of the youngest and 51% of the oldest participants reported disinfecting toothbrushes with bleach during the isolation period in single-bathroom households. However, 67% of the youngest participants shared the same toothpaste. The correct care with oral hygiene items, avoiding their sharing with other residents, is reported in the literature [28]. The objects used for oral hygiene can consider a virus reservoir [14,15] and, therefore, should not be shared by the family [29-31]. When considering people infected by the COVID-19 virus, disinfection with bleach or even toothbrush replacement is recommended since the toothbrush can present a high viral load from the nasopharynx, oropharynx and saliva [32].

Although toothbrushes were not shared in the family, most residents did not keep bristles upright, and 70,5% of the youngest, compared to the oldest (29,5%), shared the same container to store toothbrushes. The literature reported that SARS-CoV-2 transmission is primarily through contact with the virus through the respiratory tract. However, contact with fomites, which are considered objects that carry microorganisms, is also recognized, in this way, the toothbrush should be considered a possibility and its container; in addition, the toothbrush storage in an upright position facilitates faster drying and hinders the spread of microorganisms [29,33].

The SARS-CoV-2 virus was identified in feces or infective cells in the gastrointestinal tract, thus suggesting that the infection can spread through feces; for example, through the spread of aerosols from toilet flushing [34]. There is significant environmental contamination by patients with SARS-CoV-2 through fecal shedding, which suggests the environment is a potential transmission medium and supports the need for strict adherence to environmental and hand hygiene [35].

When analyzing behaviors with oral hygiene items in single-bathroom households during home isolation, more chances to present inappropriate habits and worse behaviors were observed among the youngest participants. During the pandemic period, an increase in the prevalence of behavioral problems among adolescents and young adults had been reported, who attribute it to generalized changes in the social environment, such as forced physical distancing and reduced face-to-face social contact with peers, causing a substantial impact on brain and behavioral development, including those related to health care [36]. Thus, adolescents tend to reduce good behaviors contributing to oral health maintenance. The authors declare that self-esteem can modulate adolescent oral health behaviors [37]. Regarding health behaviors and risks of COVID-19 infection, the study of the State of Ceará showed that young individuals are more vulnerable to COVID-19 contamination due to the worst behaviors related to the pandemic period [38].

The data analysis decision by <40 years and ≥ 40 years was based on a literature review, which pointed to the age of 40 as the human adult age immediately preceding the onset of old age [39]. We conducted a sensitivity analysis considering a cutoff of 35 years, and the findings were similar to the current cutoff.









Online data collection has been reported as a safe method of obtaining personal information [40]. This method is faster than face-to-face questionnaires, does not require data entry and allows participants to respond to the questionnaire in their home environment at a convenient time. However, this tool was restricted to those with access to an internet connection, who are often higher educated individuals. In this study, more than 75% of our sample were highly educated individuals, thus limiting the scope of our findings regarding the entire population.

Our sample design targeted individuals living in single-bathroom households, simplifying investigating the aspects of interest. Data from the Brazilian Institute of Geography and Statistics (IBGE) showed that 69% of residents of the municipality of Palhoça lived in single-bathroom households in 2010 [41]. Similarly, 64% of respondents (549 out of 862) lived in a single-bathroom residence and were eligible for the study.

Conclusion

Individuals in home isolation reported good oral hygiene habits; however, behaviors with oral hygiene items in single-bathroom households were neglected, especially by younger participants. In addition, the chances of cumulative inappropriate habits were observed, and the official protocols were not complied with in both groups. Guidelines on appropriate behaviors with oral hygiene items in bathrooms should be part of COVID-19-related protocols; thus, oral health professionals play an important role in the dissemination of simple basic guidelines directed to people at risk of infection.

Authors' Contributions

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All authors declare that they contributed to critical review of intellectual content and approval of the final version to be published.

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Conflict of Interest

The authors declare no conflicts of interest.

Data Availability

The data used to support the findings of this study can be made available upon request to the corresponding author.

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