

Impact of the COVID-19 pandemic on the timing of dental care in elderly peruvians

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ABSTRACT

In Peru, there is low dental service use among older adults, in addition to a social gradient for use. Furthermore, the COVID-19 pandemic triggered complex scenarios characterized by inadequate access to health services, with greater impact on vulnerable population groups such as the elderly. The aim of this study was to determine the impact of the COVID-19 pandemic on the time since last dental care visit among elderly Peruvians. It was a cross-sectional study conducted on a population of 5247 respondents in 2019, and 5066 respondents in 2020. The study considered the answers of people who responded to the question on the last time they had received dental care, extracting a total 4045 subjects for 2019 and 3943 for 2020. The dependent variable was time since last dental care measured in years, while the variables on health, geographic and sociodemographic characteristics were grouped within three dimensions. A descriptive bivariate and multivariate analysis was applied by means of multiple linear regression to analyze the behavior of the variables. Time since the last dental care visit was 7.93 years (SD=8.03) in 2019 and 7.94 years (SD=7.28) in 2020. A hierarchical multiple linear regression analysis was performed, where no variable in the 2019 model was significant; while for 2020, health, geographic, and sociodemographic characteristics variables were significant. In the analysis where the 'year' variable becomes independent, only model 4, which considers all variables, was valid (p=0.018). The variables 'area of residence' and 'wealth index' were also significant. To conclude, the 2020 pandemic year for COVID-19 had no impact on the time since last dental care visit among elderly Peruvians, though factors such as area of residence and wealth index were found to be associated with the time since last dental care visit.

Keywords: delivery of health care - dental care for aged - COVID-19 - health services accessibility - cross-sectional studies.

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Impacto de la pandemia de COVID-19 en el tiempo de la atención odontológica en adultos mayores peruanos

RESUMEN

En Perú, los adultos mayores presentan un bajo uso de los servicios odontológicos, además de percibirse una gradiente social para su utilización. Adicionalmente, la pandemia por COVID-19 desencadenó escenarios complejos, caracterizados por un inadecuado acceso a los servicios de salud, que afectó con mayor énfasis a grupos poblacionales vulnerables, como las personas en edades extremas. El objetivo de este estudio fue determinar el impacto de la pandemia por COVID-19 en el tiempo de atención odontológica en adultos mayores peruanos. Estudio transversal con población de 5247 encuestados para el 2019 y 5066 para el 2020. Se consideraron los registros de quienes respondieron a la pregunta sobre el tiempo desde su última atención odontológica, extrayéndose del 2019 un total de 4045 y para 2020, 3943 sujetos. La variable dependiente consistió en el tiempo desde la última atención odontológica medido en años; mientras que dentro de tres dimensiones, se agruparon a las variables sobre características de salud, geográficas y sociodemográficas. Se aplicó un análisis descriptivo, bivariado y multivariado, donde el tiempo desde la última atención odontológica en el año 2019 fue de 7.93 años (DE=8.03) y en el 2020 fue de 7.94 años (DE=7.28). Se realizó un análisis de regresión lineal múltiple jerárquica, donde ninguna variable del modelo 2019 fue significativa; mientras que para 2020, las variables características de salud, geográficas y sociodemográficas si lo fueron. Al análisis, donde el año pasa a ser independiente, sólo el modelo 4, que considera todas las variables fue válido (p=0.018); asimismo, el área de residencia e índice de riqueza presentaron significancia estadística. Para concluir, en el año 2020 la pandemia por COVID-19 no impactó en el tiempo de atención odontológica en adultos mayores peruanos, sin embargo, factores como área de residencia e índice de riqueza si presentaron asociación con el tiempo desde la última atención.

Palabras clave: prestación de atención de salud - cuidado dental para ancianos - COVID-19 - accesibilidad a los servicios de salud - estudios transversales.

INTRODUCTION

Most governments in the world adopted strategies to contain the spread of COVID-19, such as mandatory social distancing and lockdown. Health systems readjusted the provision of care to ensure hospital access for cases of COVID-19 with severe symptoms, even though this decision would result in a considerable reduction in the use of healthcare services, especially by people with pre-existing chronic pathologies, either because of fear of exposure to SARS- COV-2 or to avoid overloading the system¹⁻³. Some developing countries responded weakly to the health emergency, which led to more complex scenarios characterized by inadequate access to medical care, with greater impact on the most vulnerable population groups such as the elderly^{4,5}.

The situation of dental care was uncertain, and health authorities recommended limiting it to urgent or emergency cases, with the intention of reducing the risk of cross-infection by aerosols⁶. This increased the unemployment of dentists during the first months of the pandemic. However, dental services were resumed a few months later, subject to strict compliance with new biosafety protocols and with increased cost of dental procedures. This exacerbated one of the main barriers to oral health care: cost, and worsened dental services, which were already a public health problem prior to COVID-19⁷. It is important to mention that among the most affected vulnerable populations during this period were older adults, a group that is more likely to be economically disadvantaged and have limited or no dental insurance, and people who belong to ethnic or racial minorities and are subject to a more complex health situation^{8,9}. In Peru, there is low dental service use among the elderly. There is also a social gradient, with people with lower purchasing power and higher age making lower use of dental services^{10,11}. There is a clear need to generate more evidence to make visible and update the situation faced by these individuals in relation to access to dental care, especially during a health emergency. Thus, the aim of this study was to determine the impact of the COVID-19 pandemic on the time since last dental care visit among elderly Peruvians.

MATERIALS AND METHODS

This cross-sectional study considered the databases of the Demographic and Family Health Survey

(ENDES) for the years 2019 and 2020, made available by the National Institute of Statistics and Informatics of Peru (INEI). This survey is applied every year, through home interviews, to a sample of two-stage stratified conglomerates representative at national and regional levels, and according to urban and rural areas. It also includes information on access to dental care for adults over 60 years of age. For 2019, a sample size of 36,760 households was determined, amounting to 5,247 respondents, while for 2020, the sample size was 37,390 households and 5066 respondents. It is assumed that the decrease in participants between years could be linked to the COVID-19 pandemic. This study only considered the responses of those who answered the question about the time since their last dental care visit, which included 4045 subjects (77.09%) for the year 2019, and 3943 (77.83%) for 2020. The total sample for both years was 7988 (77.46%)¹².

Time in years since the last dental care visit was defined as the dependent variable, and the years (2019 and 2020) as independent variables, considering that the COVID-19 pandemic took place in Peru during 2020. Other covariates were added to the study, which were grouped following a 3-dimenseional structure: health characteristics, geographic characteristics and sociodemographic characteristics. Health characteristics considered health insurance coverage and place providing dental care (care provided by the Ministry of Health, Social Security [EsSalud], the Armed Forces and Police [FF.AA./PNP] or the private sector). Geographic characteristics considered area of residence (urban or rural); natural region (metropolitan Lima [Peru's capital city], the rest of the coast, highlands and jungle); place of residence (capital, city, town or countryside); and altitude (a dichotomous variable, defined as less or more than 2500 meters above mean sea level [MAMSL]). The sociodemographic dimension was composed of the wealth quintile, defined as the particularities and availability to each household of certain consumer goods and services, to which the methodology of the Demographic and Health Surveys Program is subsequently applied, based on which a score is assigned to each household (and that same value is assigned to each of its residents) to rank them from poorest to richest^{12,13}. Respondents were also grouped according to age (60 to 74 or 75 to 97 years) and sex. It is important

to highlight that previous research has analyzed the behavior of the mentioned covariables.^{13,10,14}

The databases were obtained from the INEI's official website (<http://iinei.inei.gob.pe/microdatos/>) through various modules, which were then unified into a single database to be analyzed using the SPSS® v. 25.0 program (IBM, NY, US). This was done using the complex samples module, since it is a national survey with possible representative estimates. It should be noted that for the statistical analysis, a descriptive analysis was performed for the qualitative variables through the evaluation of the absolute and relative frequencies; then, the average and standard deviation of the variable time since last dental care visit was calculated. The Kolmogorov-Smirnov test was used to evaluate whether the result variable had normal distribution according to the other variables. Nonparametric Mann-Whitney U tests were applied for dichotomous variables and Kruskal-Wallis for polytomous variables. A hierarchical multiple linear regression was prepared with the aim of constructing models between the independent variables and the time since the last dental care visit, where each dimension were evaluated according to the year of care separately and then as a whole; highlighting that prior to this process, a logarithmic transformation was applied to the result variable, with the aim of giving it the characteristic of normality. For this research, a confidence level of 95% was considered, and a value of $p < 0.05$ as an indicator of statistical significance in all the applied tests. For the analysis, SPSS® v. 25.0 (IBM, NY, US) was used.

Since this is a database with a secondary, anonymous source of information, the approval of an ethics committee was not necessary. Moreover, the information was freely available, provided by the INEI.

RESULTS

Time since the last dental care visit was 7.93 years (SD=8.03) in 2019 and 7.94 years (SD=7.28) in 2020, being statistically significant by bivariate analysis ($p=0.021$). However, statistical significance could be attributed to the use of non-parametric tests, as well as to the sample size used. In 2019, time since the last dental care visit differed significantly according to health insurance type, natural region, altitude and age ($p < 0.05$); while in 2020, there was no difference according to the covariates ($p > 0.05$) (Table 1).

A hierarchical multiple linear regression analysis was performed, analyzing the models in separate years and as a whole. When the analysis was done by separate years, the models were not significant for any variable in 2019 ($p > 0.05$). For 2020, models 1, 2 and 3, which consider health, geographic and sociodemographic characteristics, were significant (Table 2). When analyzed as a whole, and year is an independent variable, only model 4, which considers year, health, geographic and sociodemographic characteristics, is valid ($p=0.018$) with an $R^2\%$ of 1.10 and constant equal to - 792.728; with the significant variables being area of residence with an unstandardized regression coefficient (b) of -1.428 and a 95% confidence interval (95%CI) between -2.633- -0.223 ($p=0.020$), and wealth index with $b = -0.493$ and 95%CI= -0.852- -0.133 ($p=0.007$) (Table 3).

DISCUSSION

During the COVID-19 pandemic, health systems worldwide faced a critical scenario, a situation that was exacerbated in vulnerable populations, who were limited either because of their condition of risk for the disease or when seeking health services¹⁵. Moreover, the vulnerability that has characterized older adults in all contexts is indisputable, especially because they have limited oral health, little knowledge regarding the importance of dental health, and difficulty in moving around, with those living in shelters or confined to their homes being at greater risk¹⁶. The current study found no difference in time since the last dental care visit for the years 2019 and 2020 among elderly Peruvians; however, the bivariate statistical analysis does show significant differences.

Regarding the situation in Peru, Azañedo et al. reported that dental care for older adults was scarce. Only a quarter of this age group had received dental care, and most of them came from urban areas and received care at private health facilities, or from the coastal region of Peru¹¹. It should also be considered that there is a gradient associated to receiving oral health care according to socioeconomic level, where older adults with lower purchasing power have a low probability of receiving dental services, as reported by Carbajal-Rodriguez et al¹⁰. Similarly, Azañedo et al. reported that at national level, the use of dental health services decreased with age, which could be due to complications related to aging, such as difficulties in mobility, functional

Table 1. Health, geographic and sociodemographic characteristics of elderly Peruvians in 2019 and 2020

Variables	n	%	Time since last dental care visit									
			2019					2020				
			n	%	X	SD	p	n	%	X	SD	p
Year of the COVID-19 Pandemic	7988	100.00	4045	50.64	7.93	8.03		3943	49.36	7.94	7.28	0.021*
Health characteristics												
Place providing dental care												
Ministry of Health	1561	26.32	1110	27.54	7.72	8.27	0.097**	451	23.72	8.73	8.84	0.578*
Social Security (EsSalud)	477	8.04	324	8.04	7.11	6.69		153	8.05	7.56	6.42	
Armed Forces and Police	47	0.79	25	0.62	10.56	13.56		22	1.16	10.77	13.54	
Private sector	3846	64.85	2571	63.80	8.10	8.01		1275	67.07	8.17	8.04	
Health Insurance												
Without insurance	1108	13.87	591	14.61	8.78	8.46	0.003*	517	13.11	8.04	7.37	0.638*
With insurance	6880	86.13	3454	85.39	7.79	7.94		3426	86.89	7.91	7.27	
Geographic characteristics												
Area of residence												
Urban	4951	61.98	2455	60.69	7.77	7.57	0.608*	2496	63.30	7.74	6.86	0.422*
Rural	3037	38.02	1590	39.31	8.18	8.68		1447	36.70	8.26	7.95	
Natural region of residence												
Lima metropolitan area	1073	13.43	518	12.81	7.64	7.37	0.020**	555	14.08	7.73	6.76	0.358**
Rest of the coast	2294	28.72	1131	27.96	8.05	7.98		1163	29.50	7.98	7.04	
Highlands	3254	40.74	1752	43.31	7.55	7.60		1502	38.09	7.60	6.83	
Jungle	1367	17.11	644	15.92	9.01	9.53		723	18.34	8.69	8.76	
Place of residence												
Capital	751	39.74	509	40.05	7.30	6.76	0.560**	242	39.10	7.65	7.24	0.765**
City	460	24.34	305	24.00	7.55	7.06		155	25.04	8.66	9.17	
Town	342	18.10	235	18.49	8.20	9.22		107	17.29	8.96	9.34	
Countryside	337	17.83	222	17.47	8.69	9.48		115	18.58	8.57	9.02	
Altitude												
Less than 2500 MAMSL	5220	65.35	2561	63.31	8.33	8.46	0.001*	2659	67.44	8.15	7.59	0.057*
Over 2500 MAMSL	2768	34.65	1484	36.69	7.24	7.17		1284	32.56	7.48	6.58	
Sociodemographic characteristics												
Wealth Quintile												
1st quintile	458	17.53	233	17.09	8.57	10.69	0.220**	225	18.01	8.98	9.02	0.482**
2nd quintile	452	17.30	237	17.39	7.81	7.24		215	17.21	7.94	7.07	
3rd quintile	542	20.75	291	21.35	8.20	7.80		251	20.10	8.31	7.63	
4th quintile	530	20.29	272	19.96	7.93	7.64		258	20.66	7.64	7.50	
5th quintile	630	24.12	330	24.21	6.54	5.43		300	24.02	7.45	5.92	
Age												
60-74	6021	75.38	2934	72.53	7.68	7.63	0.003*	3087	78.29	7.90	7.19	0.980*
75-97	1967	24.62	1111	27.47	8.62	8.95		856	21.71	8.03	7.61	
Sex												
Male	3746	46.90	1833	45.32	8.09	8.60	0.642*	1913	48.52	7.88	7.17	0.999*
Female	4242	53.10	2212	54.68	7.80	7.52		2030	51.48	7.98	7.38	

*Mann Whitney U Test. **Kruskal Wallis Test.

Table 2. Hierarchical multiple regression models for health, geographic and sociodemographic characteristics for the time since last dental care visit in the study sample (n=32 111)

Variables	Determination Coefficient % (R2%)	Change of R2%	p-value Change of R2%	Constant	Non-standardized Regression Coefficient	Standardized Regression Coefficient	95% Confidence Interval	p-value	p-value Model
2019 Model 1									
Health characteristics	0.20	0.20	0.231	9.512					0.231
Place of dental care					0.002	,000	-0.311 - 0.315	0.990	
Health Insurance					-0.968	-,048	-2.085 - 0.148	0.089	
Model 2									
Health characteristics	0.60	0.40	0.337	1.475					0.279
Place of dental care					0.035	0.006	-0.284 - 0.353	0.832	
Health Insurance					-0.895	-0.044	-2.017 - 0.228	0.118	
Geographic characteristics									
Area of residence					-0.578	-0.031	-1.923 - 0.768	0.400	
Natural region of residency					0.166	0.022	-0.286 - 0.618	0.472	
Place of residence					0.422	0.064	-0.027 - 0.872	0.065	
Altitude	-0.445	-0.025	-1.567 - 0.677	0.437					
Model 3									
Health characteristics	1.10	0.50	0.096	2.159					0.129
Place of dental care					0.100	0.018	-0.226 - 0.427	0.546	
Health Insurance					-0.884	-0.044	-2.006 - 0.239	0.123	
Geographic characteristics									
Area of residence					-1.106	-0.059	-2.592 - 0.379	0.144	
Natural region of residency					0.051	0.007	-0.425 - 0.526	0.834	
Place of residence					0.337	0.051	-0.121 - 0.795	0.149	
Altitude					-0.569	-0.032	-1.695 - 0.558	0.322	
Sociodemographic characteristics									
Wealth Quintile					-0.375	-0.071	-0.800 - 0.051	0.084	
Age	0.884	0.049	-0.102 - 1.870	0.079					
Sex	0.279	0.018	-0.554 - 1.111	0.512					
2020 Model 1									
Health characteristics	1.40	1.10	0.012	7.597					0.012
Place of dental care					-0.641	-0.101	-1.143 - -0.138	0.013	
Health Insurance					1.306	0.052	-0.678 - 3.290	0.197	
Model 2									
Health characteristics	2.50	1.50	0.162	8.634					0.018
Place of dental care					-0.630	-0.099	-1.133 - -0.128	0.014	
Health Insurance					1.245	0.050	-0.737 - 3.227	0.218	
Geographic characteristics									
Area of residence					-0.838	-0.044	-2.727 - 1.050	0.384	
Natural region of residency					-0.666	-0.087	-1.317 - -0.014	0.045	
Place of residence					0.615	0.088	-0.066 - 1.295	0.077	
Altitude	0.291	0.015	-1.354 - 1.937	0.728					
Model 3									
Health characteristics	3.50	2.00	0.102	12.042					0.011
Place of dental care					-0.529	-0.083	-1.038 - -0.019	0.042	
Health Insurance					1.072	0.043	-0.917 - 3.062	0.290	
Geographic characteristics									
Area of residence					-1.772	-0.093	-3.850 - 0.305	0.094	
Natural region of residency					-0.954	-0.124	-1.651 - -0.256	0.007	
Place of residence					0.398	0.057	-0.307 - 1.103	0.268	
Altitude					-0.043	-0.002	-1.708 - 1.621	0.959	
Sociodemographic characteristics									
Wealth Quintile					-0.767	-0.135	-1.437 - -0.098	0.025	
Age	0.810	0.040	-0.778 - 2.398	0.317					
Sex	0.526	0.033	-0.740 - 1.792	0.415					

Table 3. Hierarchical multiple regression models for year, health, geographic and sociodemographic characteristics for the time since last dental care visit in the study sample (n=32 111).

Variables	Determination Coefficient % (R ² %)	Change of R ² %	p-value Change of R ² %	Constant	Non-standardized Regression Coefficient	Standardized Regression Coefficient	Confidence Interval 95%	p-value	p-value Model
Model 1									
Year of the COVID-19 Pandemic	0.00	0.00	0.438	-578.721	0.290	0.018	-0.443 - 1.024	0.438	0.438
Model 2									
Year of the COVID-19 Pandemic	0.20	0.10	0.295	-666.743	0.335	0.021	-0.402 - 1.071	0.373	0.385
Health characteristics									
Place of dental care					-0.197	-0.034	-0.464 - 0.070	0.148	
Health Insurance					-0.368	-0.017	-1.348 - 0.611	0.461	
Model 3									
Year of the COVID-19 Pandemic	0.50	0.40	0.149	-660.893	0.332	0.020	-0.405 - 1.069	0.377	0.200
Health characteristics									
Place of dental care					-0.179	-0.030	-0.448 - 0.091	0.193	
Health Insurance					-0.353	-0.016	-1.335 - 0.628	0.480	
Geographic characteristics									
Area of residence					-0.775	-0.041	-1.869 - 0.318	0.165	
Natural region of residence					-0.117	-0.015	-0.489 - 0.255	0.538	
Place of residence	0.482	0.071	0.106 - 0.858	0.012					
Altitude					-0.211	-0.012	-1.137 - 0.715	0.655	
Model 4									
Year of the COVID-19 Pandemic	1.10	0.60	0.008	-792.728	0.398	0.024	-0.338 - 1.134	0.289	0.018
Health characteristics									
Place of dental care					-0.100	-0.017	-0.374 - 0.175	0.478	
Health Insurance					-0.371	-0.017	-1.351 - 0.610	0.459	
Geographic characteristics									
Area of residence					-1.428	-0.076	-2.633 - -0.223	0.020	
Natural region of residence					-0.284	-0.037	-0.676 - 0.109	0.157	
Place of residence					0.362	0.054	-0.023 - 0.747	0.065	
Altitude					-0.401	-0.022	-1.332 - 0.531	0.399	
Sociodemographic characteristics									
Wealth Quintile					-0.493	-0.091	-0.852 - -0.133	0.007	
Age	0.838	0.045	-0.002 - 1.678	0.051					
Sex	0.391	0.025	-0.304 - 1.087	0.270					

dependence and possible compromise of social skills for communication¹⁷. That is why, with the aim of contributing to improving the comprehensive health and quality of life of people aged 60 years and older, the Peruvian Ministry of Health designed the “Peru Smiles” plan, whose implementation period is from 2019 to 2022, to provide oral rehabilitation through complete dental prostheses for older adult beneficiaries¹⁸. Despite these efforts, the health authority has not yet presented official information on the progress of the plan.

The onset of the COVID-19 pandemic evidenced the complex situation of older adults as a result of their greater risk of developing complex conditions or dying if they contracted the infection, possibly associated with pre-existing comorbidities. The disease also became a potential threat to the physical and psychological wellbeing of individuals over 60 years of age, due to the sequelae following the development of the infection such as decreased immunity, fragility, and cognitive impairment; resulting in a decrease in the levels of quality of life^{19, 20}. Within this context, health services were

restructured to prioritize care for cases of COVID-19, in addition to trying to contain the spread of the disease. Regarding dental care, Brian et al. mention that access to oral health services is even more limited for those populations at high risk of infection with COVID-19, ratifying previous provisions that suggested delaying non-urgent or emergency care as much as possible²¹. Some authors projected that dental care for older adults would decrease by up to 80%, resulting in deterioration of their oral health. This was subsequently observed when dental activities were resumed during the pandemic^{8,22}, possibly because efforts were no longer directed to prevention strategies. The suspension of dental practices nationwide during the first three months of the pandemic due to the health emergency resulted in a significant reduction in people seeking dental services and a consequent delay in treatment. Subsequently, thanks to the establishment of Measures for Citizenship towards a New Coexistence²³, in May 2020, oral health services were reactivated, adapting their biosafety protocols, identifying risk factors and strictly following the provisions defined in Health Directive No. 100-MINSA-2020-DGIESP²⁴.

Regardless of the years evaluated, the current study shows that residents in rural areas presented significant differences in time since last dental care visit, observing a decrease in the period to access the services, compared to those who came from urban territories. Likewise, some studies have shown that the area of residence is associated with the emergence of inequities in access to dental services^{10,11}. On the contrary, some reports have determined that living in urban areas is favorably linked to the practice of habits beneficial to oral health, such as optimal toothbrushing in a sample of Peruvian children. However, access to dental services is still scarce, while the number of inhabitants in rural areas who have health insurance is greater than in urban areas²⁵. The wealth quintile variable also showed statistical differences in the time since last dental care visit, noting that people with greater economic capacity delayed their dental care less than those who were poorer. Consistently with this finding, a study by Hernández-Vásquez et al. confirmed that, over a 13-year period, the Peruvian population in general

increased its use of dental services, while inequities in seeking care narrowed. It is important to note that this narrowing of gaps was not observed in the older age group, where those who benefited the most were the wealthier population. Similarly, an investigation with secondary information on Peruvian adults aged 60 years and older indicated a low frequency of dental care for this age group, noting that the Wealth Index factor determined differences in its use. Likewise, it is mentioned that at national level, oral rehabilitation treatments are not included in programs such as Universal Health Insurance^{26,17}. Scientific evidence suggests that oral health is deficient in older adults, who have high prevalence of caries, periodontal disease and high number of missing teeth, leading to complications in the functions of the oral cavity, as well as contributing directly to worsening comorbidities²⁷.

The limitations of this research include its cross-sectional design, which makes it impossible to link the findings to a causal relationship. Moreover, the present study resorted to the analysis of secondary information, which may have contained inaccuracies at the time of collection, or recall biases by the participants. Nevertheless, the ENDES survey is a useful tool, whose results allow a first approximation to the oral health situation of older Peruvians, in order to propose future public policies that seek to improve the quality of life of this vulnerable population.

The results obtained confirm that older adults delay seeking oral health services, leading to limited access to care. The situation does not seem to be linked to the impact of COVID-19, but rather, is the result of the sustained increase of unattended needs, which were not identified by those responsible. Consequently, the inequity gap for a vulnerable age group increased. All this suggests that older Peruvians have always faced catastrophic scenarios when seeking to meet their health needs, and not only as a result of the emergence of a pandemic. Based on the above discussion, it is concluded that the year 2020 of the COVID-19 pandemic did not have an impact on the time since last dental care visit among elderly Peruvians, but that factors such as area of residence and wealth index were associated with the time since last dental care visit.

DECLARATION OF CONFLICTING INTERESTS

The authors declare no potential conflicts of interest regarding the research, authorship, and/or publication of this article.

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