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Factors Associated with SARS-CoV-2 Positivity in Patients Treated at the Lambayeque Regional Hospital, Peru during a Pandemic Period

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Abstract: The aim of this study was to provide additional data on mortality from COVID-19 with particular attention to the factors associated with the positivity of patients admitted to the Lambayeque Hospital in Peru. A retrospective cohort analysis was carried out to determine the clinical-epidemiological factors associated with positivity for SARS-CoV-2 in patients treated at the Lambayeque Regional Hospital during the health emergency period in the context of the COVID-19 pandemic. It was observed that, as the demographic age group increased, the percentage of seropositivity increased, with 66.8% of elderly adults testing positive, compared to 37.4% of children ($p < 0.001$). More seropositive men than women were evident (61.1% vs. 54.1%; $p < 0.001$). The most frequent symptom of patients with suspected COVID-19 was cough (65.0%). However, the symptoms with the greatest frequency of seropositive patients were ageusia (78.6%) and fever (77.6%); cough was one of the symptoms with the lowest (63.9%) (p-value < 0.001). The comorbidities with the most seropositive patients were obesity (80.7%) and diabetes mellitus (73.6%) (p-value < 0.001), different from the top comorbidity of heart disease (12.7%) in suspected COVID-19 patients. In terms of disease signs, abnormal findings on MRI (98.11%) and dyspnea (28.7%) were the most common in suspected COVID-19 patients, similar to those in seropositive patients, which were dyspnea (81.4%) and abnormal tomography findings (75.3%) (p-value < 0.001).

Keywords: COVID-19; coronavirus infections; mortality; positivity; Peru; death

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1. Introduction

At the end of December 2019, the appearance of a novel viral respiratory infection caused by the coronavirus (COVID-19) was reported in China [1,2]. During the initial wave of the disease in Peru, Lambayeque reached COVID-19 seroprevalences of 30% [3]. Peru implemented a strict quarantine [2,4–7] and social distancing [8–10] measure, but still became the country with the highest mortality rate [11], which caused significant detrimental mental effects [12–24]. The rapid dissemination of COVID-19 in Peru has been reported to have been aggravated by the fragile healthcare system [25–28], the spread of fake news [29], and conspiracy theories [30]. The detrimental mental health effects [31,32] affected students, causing technostress [33] and multitasking behavior [34]. The general population implemented self-care behaviors [35,36], such as self-medication [26,37,38] and preferential use of medicinal plants [26,38] because of their bioactive compounds content [39–50].

COVID-19 infections have varied during the first and second waves, becoming more severe, with particularly high mortality rates [51,52] among the elderly (>65 years) and comorbidities such as cardiovascular disease [53–55], chronic lung disease [56,57], kidney disease chronic [58–61], and other factors, such as diabetes [62–66], hypertension [67–72], and obesity [73–77]. As of May 2022, more than 3 million infected people (approximately 10% of the entire population) and 213,000 deaths caused by COVID-19 have been reported in Peru [78].

Previous studies have reported that age, obesity, and febrile response may be possible risk factors for the development of COVID-19 pneumonia [79]. Additionally, fever has been reported to have good sensitivity and specificity (64.0% and 63.9%), cough has high sensitivity but low specificity (79.6% and 15.5%), and dyspnea is the most specific symptom, but demonstrates low sensitivity [80]. In addition, previous studies have paid particular attention to evaluating the clinical characterization and severity of the disease [81]. However, few studies evaluated factors associated with positivity for COVID-19 [80]. Additionally, in Peru, there is no previous evidence of factors associated with the positivity of COVID-19. Therefore, it is necessary to generate local epidemiological evidence. To help guide clinicians and patients, the present study aims to provide further data on mortality from COVID-19, with special attention given to the factors associated with the positivity of patients admitted to the Lambayeque Regional Hospital in Peru.

2. Methodology

2.1. Study Design

A retrospective analytical cohort design study was carried out to determine the clinical-epidemiological factors associated with positivity for SARS-CoV-2 in patients treated at the Lambayeque Regional Hospital during the health emergency period in the context of the epidemic of COVID-19.

2.2. Population and Samples

The population consisted of patients diagnosed with COVID-19 in facilities belonging to the Regional Hospital of Lambayeque from March 2020 to September 2021. The sample consisted of patients with a suspected diagnosis of COVID-19 notified in the Notification System of the Ministry of Health (NotiWeb-MINSA). The sample included confirmed COVID-19 patients, new or continuing MINSA users, and those who had been treated and notified in the NotiWeb system in Lambayeque during the aforementioned period. Patients with incomplete clinical records and those with absent clinical records in the variables of interest were excluded.

2.3. Procedures

The database of the epidemiological notification sheets of patients treated at the Lambayeque Regional Hospital during the health emergency period due to COVID-19 was exported. The principal investigator enters and uses the records notified to the Epidemiolog-

ical Surveillance System of the National Center for Epidemiology, Disease Prevention and Control (CDC, Peru). The general data of the notification and the patients were recorded, including the date of notification and the classification of the cases; general epidemiological variables: sex, age, and categorized age were recorded; clinical variables: symptoms were recorded, such as cough, sore throat, nasal congestion, shortness of breath, fever, chills, malaise, diarrhea, nausea/vomiting, headache, muscle pain, chest pain, abdominal pain, abnormal CT scan, abnormal X-ray findings, and comorbidities, such as cardiovascular disease, diabetes, obesity, tuberculosis, HIV, kidney disease, chronic lung disease, and cancer. The dependent variable was SARS-CoV-2 positivity, defined as detecting the SARS-CoV-2 virus utilizing molecular and serological tests in patients suspected of having COVID-19.

2.4. Statistical Processing and Analysis

Statistical analysis was performed with STATA v16.0 software (StataCorp LP, College Station, TX, USA). Numerical variables were estimated using means and standard deviations for variables with normal distributions. The Chi-square exact test (categorical variables) was used to compare clinical, epidemiological categorical variables among confirmed SARS-CoV-2 seropositive patients. In the case of numerical variables (age), the Student's *t*-test was used after evaluating the assumption of normal distribution and homoscedasticity. The Mann-Whitney U test was also utilized. p values less than 0.05 were considered statistically significant.

Absolute and relative frequencies were estimated for categorical variables. Both simple and multiple regression analyses were performed to determine the factors associated with SARS-CoV-2 infection, estimating the prevalence ratio (PR) and the 95% confidence intervals (95% CI) using generalized linear models. The Poisson distribution family, the logarithmic link function, and the robust variance were employed. Nested models were built using the Log-Likelihood Ratio Test (LRTEST) to conclude which parsimonious model includes the variables that contribute to the final model. Additionally, the variables that do not contribute to the model were adjusted with the parsimonious model.

2.5. Ethics

The Ethics Committee approved the research protocol of the Lambayeque Regional Hospital. Additionally, the study was registered in the repository of health research projects (PRISA) of the National Institute of Health (INS, Lima, Peru) for its respective approval review. The privacy and confidentiality of the patient data used for the research was respected. Only anonymous codes were used as numerical inputs.

3. Results

A total of 8884 patients were evaluated; there was a predominance of adults and older adults (48% and 29%, respectively) with similarities in sex distribution. Of the total, 57.6% (5115 patients) were SARS-CoV-2 positive, 440 patients were confirmed positive based on antigen test, 1023 patients were confirmed positive based on PCR test, and 3652 were confirmed positive based on serological test. The most frequent symptom was cough (65%) and general malaise (48%), as well as fever (35.9%) and odynophagia (30%); while in 1.1% of patients, clinical abnormalities were observed in their tomography results. CVD and diabetes were the most frequent comorbidities. Further details are presented in Table 1.

It was observed that, as the age group increased, the percentage of seropositivity increased, with 66.8% of older adults testing positive, compared to 37.4% of children ($p < 0.001$). There were more seropositive men than women (61.1% vs. 54.1%; $p < 0.001$). Of the most frequent symptoms, those who had a cough 63.9%, general malaise (74.6%), as well as fever (77.6%), and sore throat (73%) were seropositive; all of them had a p-value < 0.001. Patients with CVD and diabetes with seropositivity were 71.3% and 73.6%. More clinical findings are presented in Table 2.

Table 1. Clinical-epidemiological characteristics of patients with suspected COVID-19 at Hospital Regional Lambayeque, 2020–2021 (n = 8884).

Characteristics		*n* (%)
Age (year) ‡		45.0 ± 22.51
Age (categorized)		
	Children	942 (10.6)
	Teenager	120 (1.4)
	Young adult	942 (10.6)
	Adult	4295 (48.4)
	Elderly	2585 (29.1)
Sex		
	Male	4481 (50.4)
	Female	4403 (49.6)
Symptoms (Yes)		
	Fever	2714 (35.9)
	Chill	604 (8.1)
	General discomfort	3748 (48.7)
	Cough	5030 (65.0)
	Throat pain	2260 (30.0)
	Nasal congestion	1116 (14.9)
	Diarrhea	643 (8.7)
	Nausea	411 (5.6)
	Headache	1314 (17.6)
	Irritability	165 (2.3)
	Muscle pain	1203 (16.2)
	Abdominal pain	263 (3.6)
	Chest pain	619 (8.4)
	Joint pain	448 (6.1)
	Anosmia	40 (0.6)
	Ageusia	28 (0.4)
	Earache	6 (0.1)
Signs (Yes)		
	Pharyngeal exudate	154 (2.1)
	Conjunctival injection/hyperemia	59 (0.8)
	Convulsion	37 (0.5)
	Dyspnea/tachypnea	2182 (28.7)
	Abnormal lung auscultation	753 (10.1)
	Abnormal findings on radiography	238 (3.2)
	Abnormal findings on ultrasound	11 (0.2)
	Abnormal findings on tomography	77 (1.1)
	Abnormal findings on MRI	363 (98.11)

Table 1. *Cont.*

Characteristics		*n* (%)
Comorbidity-risk factors		
	Heart disease	953 (12.7)
	Mellitus diabetes	651 (8.8)
	Cerebrovascular disease	11 (0.2)
	Down's Syndrome	2 (0.0)
	Obesity	228 (3.1)
	Pregnancy	348 (4.7)
	HIV	27 (0.4)
	Chronic kidney disease	362 (4.9)
	Chronic lung disease	64 (0.9)
	Cancer	267 (3.6)
Contact with COVID-19 case		
	No	212 (78.9)
	Yes	57 (21.1)
Confirmed COVID-19		
	No	3769 (42.4)
	Yes	5115 (57.6)

‡ Age expressed as mean ± standard deviation.

Table 2. Clinical-epidemiological factors associated with seropositivity of SARS-CoV-2 presented in the Lambayeque Regional Hospital.

Characteristics	Seropositivity		*p*-Value
	Negative (*n* = 379)	Positive (*n* = 5115)	
	n (%)	*n* (%)	
Age (years) †	40.16 ± 23.36	48.55 ± 21.17	<0.001
Age (category)			<0.001
Children	590 (62.6)	352 (37.4)	
Teenager	69 (57.5)	51 (42.5)	
Young adult	456 (48.4)	486 (51.6)	
Adult	1796 (41.8)	2499 (58.2)	
Elderly	858 (33.2)	1727 (66.8)	
Sex			
Female	2056 (45.9)	2425 (54.1)	<0.001
Male	1713 (38.9)	2690 (61.1)	<0.001
Symptoms (Yes)			
Fever	609 (22.4)	2105 (77.6)	<0.001
Chills	149 (24.7)	455 (75.3)	<0.001
General discomfort	954 (25.5)	2794 (74.6)	<0.001

Table 2. *Cont.*

Characteristics	Seropositivity		*p*-Value
	Negative (*n* = 379)	Positive (*n* = 5115)	
	n (%)	*n* (%)	
Cough	1815 (36.1)	3215 (63.9)	<0.001
Sore throat	610 (27.0)	1650 (73.0)	<0.001
Nasal congestion	343 (30.7)	773 (69.3)	<0.001
Diarrhea	208 (32.3)	435 (67.7)	0.001
Nausea	161 (39.2)	250 (60.8)	0.814
Headache	436 (33.2)	878 (66.8)	<0.001
Irritability	73 (44.2)	92 (55.8)	0.127
Muscle pain	344 (28.6)	859 (71.4)	<0.001
Abdominal pain	93 (35.4)	170 (64.6)	0.305
Chest pain	170 (27.5)	449 (72.5)	<0.001
Joint pain	155 (34.6)	293 (65.4)	0.084
Anosmia	12 (30.0)	28 (70.0)	0.275
Ageusia	6 (21.4)	22 (78.6)	0.065
Earache	2 (33.3)	4 (66.7)	0.799
Signs (Yes)			
Pharyngeal exudate	56 (36.4)	98 (63.6)	0.584
Conjunctival injection/hyperemia	19 (32.2)	40 (67.8)	0.325
Convulsions	15 (40.5)	22 (59.5)	0.784
Dyspnea/tachypnea	406 (18.6)	1776 (81.4)	<0.001
Abnormal lung auscultation	159 (21.1)	594 (78.9)	<0.001
Abnormal radiography findings	74 (31.1)	164 (68.9)	0.017
Abnormal ultrasound findings	4 (36.4)	7 (63.6)	0.891
Abnormal tomography findings	19 (24.7)	58 (75.3)	0.013
Comorbidity—Risk factors			
Heart disease	274 (28.8)	679 (71.3)	<0.001
Diabetes mellitus	172 (26.4)	479 (73.6)	<0.001
Cerebrovascular disease	6 (54.6)	5 (45.5)	0.270
Down's Syndrome	0 (0.0)	2 (100.0)	0.265
Obesity	44 (19.3)	184 (80.7)	<0.001
Pregnancy	142 (40.8)	206 (59.2)	0.431
HIV	18 (66.7)	9 (33.3)	0.003
Chronic kidney disease	148 (40.9)	214 (59.1)	0.354
Chronic lung disease	29 (45.3)	35 (54.7)	0.254
Cancer	152 (56.9)	115 (43.1)	<0.001
Contact with COVID-19 case			0.079
No	146 (68.5)	67 (31.5)	
Yes	32 (56.1)	25 (43.9)	

† Age expressed as mean ± standard deviation.

In the regression model (Table 3), we observed that an older age and being an adult over 21 were 79% and 56% more likely to be seropositive, respectively ($p < 0.001$ in both cases). In the parsimony model, this association was preserved.

Table 3. Simple and multiple regression results of the clinical-epidemiological factors associated with seropositivity of SARS-CoV-2 presented in the Lambayeque Regional Hospital.

Characteristics	Seropositivity					
	Simple Regression			Multiple Regression		
	PR	95% CI	*p*-Value *	PR	95% CI	*p*-Value *
Age (categorized)						
Children	Ref			Ref		
Teenager	1.14	0.91–1.42	0.260	1.12	0.87–1.44	0.379
Young	1.38	1.25–1.53	<0.001	**1.40**	**1.25–1.58**	**<0.001**
Adult	1.56	1.43–1.70	<0.001	**1.36**	**1.26–1.54**	**<0.001**
Elderly	1.79	1.64–1.95	<0.001	**1.38**	**1.30–1.60**	**<0.001**
Sex						
Female	Ref			Ref		
Male	1.13	1.09–1.17	<0.001	0.99	0.97–1.04	0.857
Symptoms (Yes)						
Fever	1.47	1.42–1.52	<0.001	**1.20**	**1.16–1.24**	**<0.001**
Chill	1.25	1.19–1.31	<0.001	0.96	0.91–1.01	0.122
Discomfort	1.52	1.46–1.58	<0.001	**1.21**	**1.17–1.27**	**<0.001**
Cough	1.13	1.09–1.17	<0.001	1.02	0.99–1.07	0.221
Throat pain	1.29	1.25–1.33	<0.001	**1.09**	**1.04–1.12**	**<0.001**
Nasal congestion	1.15	1.11–1.21	<0.001	**1.07**	**1.02–1.12**	**0.004**
Diarrhea	1.11	1.05–1.17	<0.001	0.97	0.92–1.03	0.329
Nausea	0.99	0.91–1.07	0.815			
Headache	1.11	1.06–1.16	<0.001	0.97	0.93–1.02	0.186
Irritability	0.91	0.79–1.04	0.154			
Muscle pain	1.20	1.15–1.25	<0.001	**1.05**	**1.01–1.10**	**0.040**
Abdominal pain	1.05	0.96–1.15	0.286			
Chest pain	1.20	1.14–1.26	<0.001	0.99	0.94–1.05	0.909
Articulations pain	1.07	0.99–1.14	0.070			
Anosmia	1.14	0.93–1.39	0.217			
Ageusia	1.28	1.05–1.55	0.014	0.98	0.80–1.21	0.853
Earache	1.08	0.61–1.91	0.785			
Signs (Yes)						
Pharyngeal exudate	1.04	0.92–1.17	0.574			
Conjunctival injection	1.10	0.92–1.31	0.283			
Convulsion	0.96	0.74–1.26	0.790			
Dyspnea/tachypnea	1.51	1.47–1.56	<0.001	**1.32**	**1.28–1.37**	**<0.001**
Abnormal lung auscultation	1.32	1.27–1.38	<0.001	1.04	0.99–1.09	0.080

Table 3. *Cont.*

Characteristics	Seropositivity					
	Simple Regression			Multiple Regression		
	PR	95% CI	*p*-Value *	PR	95% CI	*p*-Value *
Abnormal findings on radiography	1.13	1.03–1.23	0.008	1.01	0.93–1.10	0.765
Abnormal findings on ultrasound	1.03	0.66–1.62	0.888			
Heart disease	1.19	1.14–1.24	<0.001	1.01	0.96–1.05	0.755
Mellitus diabetes	1.22	1.16–1.28	<0.001	**1.06**	**0.96–1.05**	**0.033**
cerebrovascular disease	0.74	0.39–1.41	0.357			
Obesity	1.32	1.24–1.41	<0.001	**1.07**	**1.00–1.15**	**0.032**
Pregnancy	0.97	0.88–1.06	0.442			
HIV	0.54	0.32–0.92	0.024	0.55	0.28–1.07	0.080
Chronic kidney disease	0.96	0.88–1.05	0.367			
Chronic lung disease	0.89	0.71–1.11	0.294			
Cancer	0.70	0.61–0.80	<0.001	1.02	0.88–1.17	0.826
Contact with COVID-19 case						
No	Ref.					
Yes	1.39	0.98–1.99	0.066			

* *p*-Values obtained using generalized linear models, Poisson family, log link function, and robust variance.

4. Discussion

4.1. SARS-CoV-2 Positivity

A positivity rate for SARS-CoV-2 of 57.6% was estimated. Moreira-Soto et al. reported a similar positivity rate of 59% during the second wave of COVID-19 in the rural population of the San Martín region-Peru; considering that our study collected data from the first and second waves of viral sickness [82]. Similarly, studies carried out in Peru during the first wave reported a seroprevalence of 13% in Ancash between March and May 2020 [83], and 21% [84] and 29% in Lima and Lambayeque between June 2020 and July 2020, respectively [3]. On the other hand, Álvarez-Antonio, et al. [85] in Iquitos-Peru reported a seroprevalence of 70% between July and August of the same year when the first wave was declining in case numbers. A time-related increase in seroprevalence was observed, possibly due to the natural course of a pandemic and the high prevalence of viral variants with higher transmission and reinfection capacities, such as the alpha and delta variant, during the first and second waves in Lambayeque-Peru [86]. Globally, it has been estimated that approximately 45% of people worldwide had SARS-CoV-2 antibodies by July 2021, and 35% excluding vaccinated individuals [87].

The estimated seroprevalence is likely due to, as in other low-income countries, citizens not having sufficient resources to enable them to apply effective or sustained social distancing measures, including hand washing or the use of suitable masks. Likewise, there is high mobilization between urban and rural centers for commerce, which is related to a high geographic dispersion despite the low population density of these communities [88]; this leads to transmission.

4.2. Factors Associated with SARS-CoV-2 Positivity

Our study found that youth, adults, and older adults had a higher prevalence of SARS-CoV-2 positivity, similar to other hospitals in Loreto and San Martin [82,83]. However, other studies found that COVID-19 seroprevalence among children younger than 12 years in Iquitos was as high as that among adults older than 60 years, but these results were not

statistically significant [84]. Additionally, another study found that participants between 21 and 50 presented with the highest frequencies of SARS-CoV-2 positivity [3]. This association could be explained by the high rate of transmissibility among young people [89] as a result of not optimally practicing social distancing and other methods to contain viral transmission.

Regarding symptoms, we found that the prevalence of positive cases increased in patients with fever, general discomfort, cough, sore throat, nasal congestion, and muscle pain, which is similar to that described by Díaz-Vélez [3], where patients reported fever (PR: 1.41), general discomfort (PR: 1.27), cough (PR: 1.44), dysosmia (PR: 1.69), chest pain (PR: 1.49), and back pain (PR: 1.45) were associated with a higher frequency of positivity [3]. This association corresponds with the international literature regarding the alpha and delta variants, and is widely described [90]. However, it contrasts with what was documented by Vera-Ponce et al., where cough, dyspnea, and diarrhea were the symptoms most associated with seropositivity [83]. While cough was the most common symptom reported in patients with suspected COVID-19 symptoms (65.0%), it was the symptom with the second least frequency (63.9%) of patients that were actually seropositive.

Patients who presented abnormal findings on lung auscultation had increased prevalence of SARS-CoV-2 positivity by 32%. Similarly, Wang, et al. [91] reported a sensitivity of 85% and specificity of 13% for the presence of fine and coarse lung crackles, and a sensitivity of 89% and specificity of 15% for patients with signs of pulmonary consolidation [92]. However, this differs from what was documented by Shi et al. and Guan et al., where most patients positive for SARS-CoV-2 had abnormal auscultation in their examination (34.8% vs. 17.5%). Only 37% were false negatives. This association could be explained by the pathophysiology of COVID-19, which produces a release of mucus in the pulmonary alveoli, producing audible sounds on auscultation when air is inspired [91]. Similarly, dyspnea was the sign with the highest prevalence of seropositive patients (81.4%) (p-Value < 0.001).

Diabetic disease increases the prevalence of SARS-CoV-2 positivity by 6%, as was reported by Alpesh Goyal et al. The seropositivity to SARS-CoV-2, evaluated before the administration of developed COVID-19 vaccines, was significantly higher in the controls between participants with DM1 (55.7% vs. 44.9%, $p = 0.028$) and DM2 (56.9% vs. 44.9%, $p = 0.013$). It was reported that this susceptibility rate does not differ between types of diabetes [93]. However, it contrasts with what was documented by Díaz-Vélez [3] and Moreira-Soto et al. [82] in populations of Lambayeque and San Martin, respectively, where no statistically significant association was observed. This association could be explained by the increased expression of angiotensin-converting enzyme 2, increased viral replication in a hyperglycemic environment, and the consequent dysregulation of the immune system and the augmented inflammatory response that occurs in patients with diabetes [94].

The prevalence of positive cases increased by 7% in obese patients; this was the comorbidity group with the most notable frequency of seropositive patients (80.7%). This is similar to that reported by Alpesh Goyal et al., where patients with preexisting overweight/obesity were 2.6 times (OR, 2.63 [95% CI, 1.54–4.47]; $p < 0.001$) more likely to be positive for SARS-CoV-2 (21). Similarly, obesity has been identified to be associated with an increased risk of severe COVID-19 disease (OR, 2.09 [95% CI, 1.67–2.62]) and mortality (OR, 1.49 [95% CI, %, 1.20–1.85]) [95]. This association could be explained by the chronic inflammation present in obese patients, coupled with respiratory compromise and impaired pulmonary perfusion due to excess body fat, and the high prevalence and presence of other comorbidities such as diabetes, hypertension, and cardiovascular disease that are associated with immune dysregulation [96].

Implications of Findings for Public Health-Epidemiology

Understanding the factors associated with a higher seroprevalence of SARS-CoV-2 is crucial to implementing effective epidemiological strategies for contact tracing, early detection, and isolation of cases. It is essential to develop genomic surveillance capabilities to define the distribution and appearance of new viral variants. Through this process,

optimal preparedness of human and financial planning for sufficient health resources can be projected and predicted.

4.3. Limitations and Strengths

The strengths of this research include that it is a study carried out in a level 3 hospital of the Ministry of Health (MINSA) of Peru, and the only one in the Lambayeque region intended to care for COVID-19 patients. Additionally, it analyzes a broad and diverse sample of clinical-epidemiological data captured through a functional hospital epidemiological surveillance system from the first and second pandemic waves in this region of northern Peru, spanning age groups from children to older adults. However, all research has limitations. This study was carried out in a single hospital in the region, so the results might not be generalizable. However, the Lambayeque region is in the northern microregion of Peru. Therefore, the data analyzed came from patients residing in multiple regions. Due to the cross-sectional design, causality between the clinical-epidemiological variables associated with seropositivity for SARS-CoV-2 cannot be ascertained. There is potential measurement bias as it was not possible to measure other variables that could influence SARS-CoV-2 seropositivity, such as level of education, socioeconomic status, and housing conditions. Furthermore, in antibody dependent but PCR negative cases, there is the risk that these individuals attended the medical facility with a resolved infection, and their symptoms might be caused by another infection. Another limitation was the lack of genomic monitoring to evaluate the prevalence of SARS-CoV-2 variants, which could affect the management of the symptomatology and the dynamics of the routine of a hospital.

5. Conclusions

A SARS-CoV-2 positivity of 57.6% in patients treated at a hospital in the Lambayeque region in Peru was determined. Additionally, the factors associated with a higher prevalence of positivity were a young age, adult, older adult, and having systemic symptoms (fever, malaise, muscle pain), respiratory symptoms (sore throat, nasal congestion), dyspnea, and obesity and diabetes mellitus as comorbidities.

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Informed Consent Statement: All the survey participants were well versed on the study intentions and were required to consent before enrollment.

Data Availability Statement: The data presented in this study are available on request from the corresponding author.

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